APRIL 2023

INDEPENDENCE

COMMUNITY WILDFIRE PROTECTION PLAN

Working together to build fire adapted communities, resilient to wildfire

WILDLAND FIRE ASSOCIATES

SWCA® ENVIRONMENTAL CONSULTANTS

Funding for this project was provided by the California Department of Forestry and Fire Protection as part of the California Climate Investments Program.

We would like to formally thank the Core Team and all stakeholders, notably Independence Fire Safe Council, Independence Volunteer Fire Department, and CAL FIRE (Independence Station), 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.

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

Signature	**Signature**
Name (printed)	**Name (printed)**
Date	**Date**
Agency /Position (printed)	**Agency /Position (printed)**

Signature	**Signature**
Name (printed)	**Name (printed)**
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EXECUTIVE SUMMARY

WHAT IS THE PURPOSE OF THIS COMMUNITY WILDFIRE PROTECTION PLAN?

The purpose of the 2023 Independence 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.
4. Provide a framework for future planning and implementation of necessary mitigation measures.

This CWPP aims to assist in protecting human life and reduce property loss due to wildfire throughout the Planning Area. This 2023 plan was compiled from reports, documents, and data developed by a wide array of contributors, including input from the Core Team and the public. This plan was compiled in 2022 and 2023 as Independence's 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 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 Independence CWPP.

WHERE IS THE PLANNING AREA?

The Planning Area includes the town of Independence, the Fort Independence Indian Reservation, the historic Mt. Whitney Fish Hatchery, the communities of Seven Pines and Oak Creek, and the surrounding area (Figure ES.1). For simplicity, the plan is called the Independence CWPP.

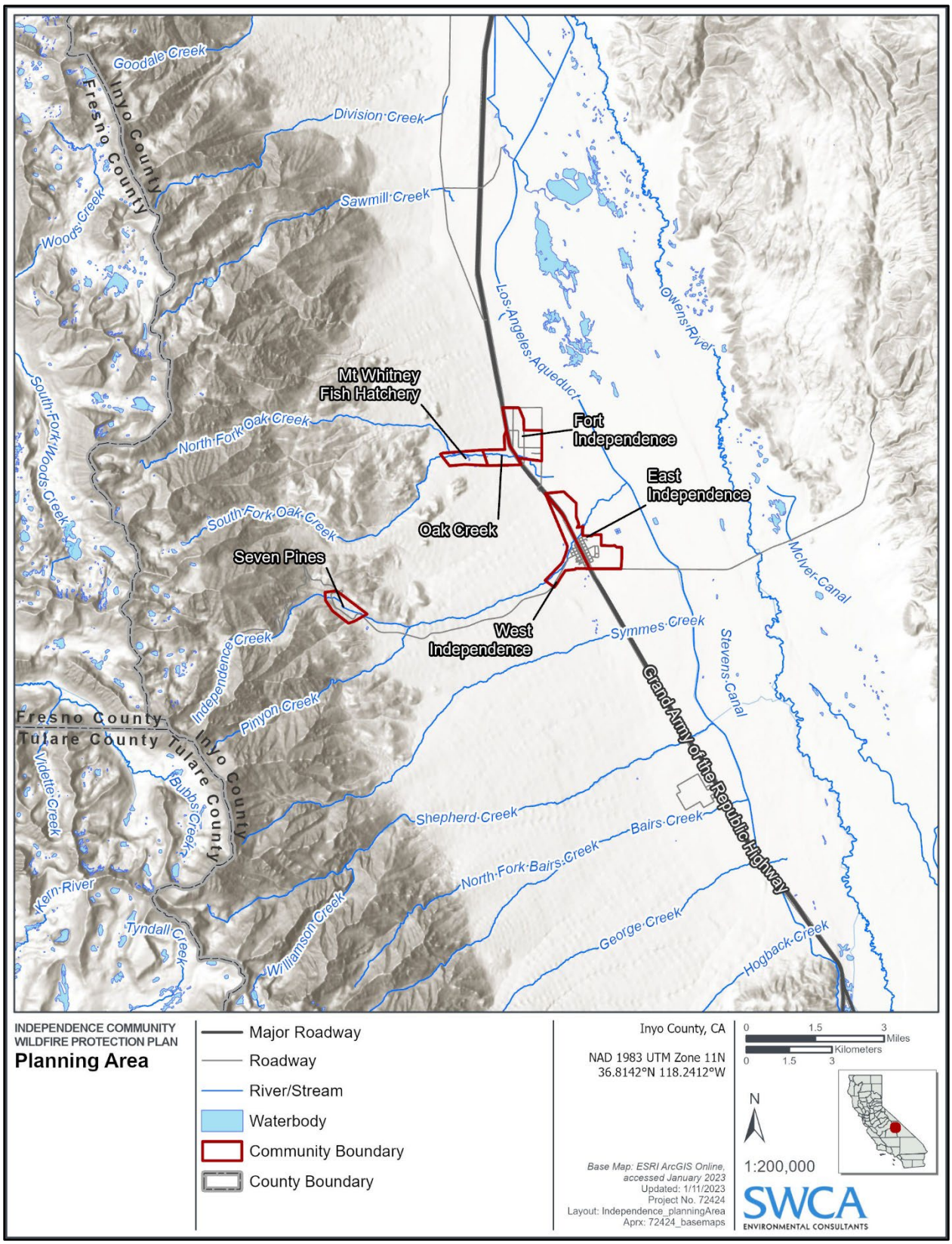

Figure ES.1. Independence CWPP Planning Area.

WHAT ARE THE KEY ISSUES ADDRESSED?

Issues addressed in this CWPP include:

- Human ignitions, particularly dispersed camping
- Fuel treatment recommendations for land management agencies and homeowners to mitigate hazard and risk
- Prioritizing hazardous fuels reduction within the perimeter of the communities, along ditches and creeks, within private properties, and on Los Angeles Department of Water and Power (LADWP) land
- Home addressing and signage
- Developing and/or upgrading water resources for fire suppression
- Ingress and egress issues, including evacuation routes, fire response access, and shelter in place locations
- Increasing community capacity and participation to accomplish community wildfire protection and prevention objectives
- Public education and outreach to homeowners, including second-home owners and absentee homeowners, to enable individuals to reduce the risk of fire to their properties, particularly regarding defensible space implementation, structural hardening measures, and community pre-fire planning
- Constant and consistent messaging for residents, visitors, and campers concerning wildfire risks and mitigation strategies
- 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 across multiple jurisdictions
- Managing fire to protect values and accomplish resource management goals, including protection and enhancement of wildlife habitat, water supply and quality, and forest health
- Recent climate patterns and associated changes to the wildland fire environment
- Disease and insect outbreaks associated with tree mortality
- Raising awareness about the natural role that fire plays in the ecosystem and maintaining resilient landscapes
- Increasing awareness of post-fire debris flows

HOW IS THE PLAN ORGANIZED?

The CWPP provides a Risk-Hazard Assessment, action items, project recommendations, and background information about the community's 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 wildland-urban interface (WUI) and fire environment and specific information about vegetation and fire history, as well as fire management and response.

Chapter 3 describes the Risk-Hazard Assessment, results of the assessment, 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 monitoring strategies to assist in tracking project progress and in evaluating work accomplished.

Appendix A contains background information on the planning process steps, state, municipal, and federal wildfire policy and direction, past planning efforts, and an overview of current land management strategies.

Appendix B contains background information on the community, including demographic and social information, land ownership, natural resources, climate and environmental information, and education and outreach programs.

Appendix C presents additional mapping.

Appendix D provides summary information on the community risk-hazard assessment for WUI communities.

Appendix E presents a sample form of the National Fire Protection Association (NFPA) Wildfire Fire Risk and Hazard Severity Form 1144.

Appendix F details funding opportunities.

Appendix G contains additional resources for community members, including a homeowner wildfire mitigation guide and a list of outside resources covering a variety of topics.

Appendix H presents information on public outreach and engagement with regards to this CWPP.

Appendix I houses project recommendations.

Appendix J outlines fuels treatment types and methods.

Appendix K Contains information on post-fire response and recovery including response agencies, safety information, and post-fire treatment methods.

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 the 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 (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.

HOW WAS THE INDEPENDENCE 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 2023 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 Independence CWPP emphasizes the importance of collaboration among multijurisdictional agencies and the public in developing fuels mitigation treatment programs to address wildfire hazards.

In addition, the 2017 Inyo County-City of Bishop Multi-Jurisdictional Hazard Mitigation Plan was consulted to develop this CWPP. Therefore, projects identified in this CWPP are in alignment with the wildfire-specific hazard mitigation actions identified in pages 110 and 111 of the hazard mitigation plan (Inyo County and City of Bishop 2017).

WHO PARTICIPATED IN DEVELOPING THE PLAN?

The development of the Independence CWPP was overseen by the Independence Fire Safe Council (FSC). Representatives from various government agencies, including California Department of Forestry and Fire Protection (CAL FIRE), Bureau of Land Management (BLM), U.S. Forest Service (USFS), LADWP, and Inyo County Office of Emergency Services (OES), along with the Fort Independence Tribe and other community or organization representatives, served as Core Team for this CWPP and drove the decision-making process. Several Core Team members have many years of experience working together in fire management for Independence and have contributed their expertise to this CWPP.

WHAT WAS THE PUBLIC INVOLVEMENT?

The Core Team engaged in public outreach using community surveys, community events and visits, and information distributed through emails. The Core Team met virtually on July 26, 2022, in person in Bishop on October 27, 2022, and hosted a public meeting at Owens Valley High School on October 25, 2022. Feedback, comments, and suggestions received from community members during community events, the community survey, and project recommendations review were synthesized and used to craft project recommendations for the Independence CWPP. Therefore, the project recommendations are specifically tailored to address the concerns and priorities of the community.

WHAT IS THE CURRENT WILDFIRE SITUATION?

Independence is the county seat of Inyo County and is roughly in the middle of the Owens Valley from north to south. Much of the town burned in 1886, and a fire damaged one of the historic buildings in town as recently as October 2022. The Inyo Complex Fire in 2007 approached Independence from the west, destroying four homes along Oak Creek and causing a partial evacuation of the town. That fire remains in the memory of area residents, denoting the risk of a major fire igniting on wildlands and burning into their communities.

Fort Independence and Independence are located on the lower portions of alluvial fans formed by Oak Creek and Independence Creek, respectively. Both communities are at an elevation of about 3,900 feet.

The Oak Creek area is immediately upslope and upstream of Fort Independence. The eastern escarpment of the Sierra Nevada is just a few miles to the west. The geographic location of the communities is significant because a few times each year, strong downslope Sierra Nevada winds create severe fire-weather conditions. As a result of this topography and regional weather patterns, the communities are particularly at risk of wind-driven wildfires approaching from the west, as well as ignitions within the community during windy weather.

Independence, Fort Independence, and the Oak Creek area are surrounded by a sagebrush scrub plant community largely composed of big sagebrush (*Artemisia tridentata*), antelope bitterbrush (*Purshia tridentata*), rubber rabbitbrush (*Ericameria nauseosus*), and a wide variety of understory forbs and grasses (Howald 2000). More recent terminology describes the native vegetation as *Artemisia tridentata* Shrubland Alliance (California Native Plant Society n.d.). Vegetation density (and therefore fuel continuity) is relatively sparse because of the arid climate (about 4–8 inches of precipitation annually on average). However, wind-driven embers would readily propagate fire through the scrubland. Although the region's arid climate limits the density of native vegetation, irrigation in Independence and Fort Independence has created "oasis" conditions and high fuel loads within the communities compared with their immediate surroundings. Irrigated agricultural fields are adjacent to both communities to the east and north. Observed from the air or Sierra Nevada, the green communities and fields stand out in marked contrast to the adjacent brown sparsely vegetated landscape. The luxuriant riparian corridors of Oak and Independence Creeks are also readily apparent from above. Although the creeks and associated vegetation provide critical aquatic and riparian habitat within an arid region, the dense and continuous vegetation carries a wildfire risk analogous to a wick through an otherwise low-fuel environment (Switzer and Umek 2022).

Seven Pines is a small tract of recreational residences on Inyo National Forest land. Seven Pines is located along Independence Creek at about 6,200 feet elevation and about 6 miles west of Independence. A pair of USFS campgrounds (Upper and Lower Grays Meadow) are immediately

downslope of Seven Pines. As these names imply, the area is relatively well-watered resulting from its riparian position and supports a robust stand of Jeffrey pine (*Pinus jeffreyi*).

WHAT RECENT FIRES OCCURRED HERE?

The Planning Area and surrounding environment consist of diverse landscapes that produce a complex wildfire setting due to variable topography, deceased trees, and an assortment of vegetation types. Large severe wildfires in or near the Planning Area during the past half century include the Inyo Complex Fire (which encompasses the Oak Fire and Seven Fire) of July 2007, the Onion Fire of July 1985, and the Georges Fire of July 2018. Small- to medium-sized fires in the western portion of the Planning Area include the 1973 Seven Pines Fire and the 2021 Robinson Fire.

WHAT IS THE PURPOSE OF THE RISK-HAZARD ASSESSMENT?

The purpose of the Risk-Hazard Assessment is to evaluate and provide information pertaining to the risk of wildland fires within the WUI of the Planning Area. 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
- Exposure and susceptibility of the WUI and VARs to wildfire based on their locations

Due to exposure to hazardous fuels, topographic conditions, and wind patterns, most of the communities within the Planning Area are rated as high risk, with Seven Pines and Oak Creek being the highest risk communities.

HOW WAS THE RISK ASSESSMENT COMPLETED AND HOW DOES IT COMPARE TO CAL FIRE'S FHSZS?

SWCA's risk assessment considers fire behavior characteristics (flame length, fireline intensity, rate of spread, and crown fire activity), fire history (occurrence and size), fire response times, the WUI (a proxy for residences and population), and highly valued resources and assets (HVRAs). In turn, the previously mentioned fire behavior components are generated by integrating several variables: vegetation (type, density, and condition), topography (aspect, slope, elevation), and weather (wind, temperature, and humidity). These components are combined and evaluated to produce a comprehensive and integrated model of wildfire risk within and around the Planning Area. The final product of the risk assessment categorizes the landscape into four levels of risk: low, moderate, high, and extreme.

Comparably, CAL FIRE's fire hazard severity zones (FHSZs) are defined based on vegetation, topography, and weather, and represent the probability of the area burning and potential fire behavior in the area. The best available science and data are used by CAL FIRE to develop these zone delineations, with the new iteration of the FHSZs also accounting for land use changes, recent fire history, new wind data, and local climate data. The FHSZ is classified as moderate, high, and very high, and is delineated based on the average hazard present across the landscape (CAL FIRE 2022a).

The primary differentiator between SWCA's risk assessment and CAL FIRE's FHSZs is that the CAL FIRE FHSZs account only for hazard, while SWCA's risk assessment accounts for hazard and the likelihood of that hazard to cause damage and/or harm (i.e., risk). Hazards are recognized as physical conditions influencing fire behavior across a given landscape, while risk identifies the potential damage a fire can have under baseline conditions (CAL FIRE 2022a). Similar to CAL FIRE's determination of FHSZs, SWCA's risk assessment considers hazards such as fire history and potential fire behavior (crown fire activity, rate of spread, flame length, and fireline intensity). However, SWCA's risk assessment also considers the extent of the WUI, fire stations drive times, and distribution of HVRAs. While not categorized as a hazard, factors such as fire station drive times can increase susceptibility to wildfires (i.e., increase risk), whereas factors such as the WUI (a proxy for life and property) and HVRAs are features that are exposed to the previously mentioned hazards.

HOW WILL THE RISK ASSESSMENT IMPACT MY INSURANCE?

The wildfire risk assessment conducted for this CWPP is not intended to be used to determine insurance premiums of home and property. Insurance companies utilize their own wildfire risk assessments to write and renew policies. Furthermore, a partnership between Insurance Commissioner Ricardo Lara and the California Governor's Office of Emergency Services, California Public Utilities Commission, CAL FIRE, and California Governor's Office of Planning and Research led to the development of a regulatory action that creates insurance incentives for implementing practices that increase home and community resilience to wildfire. This new wildfire safety regulation aims to make insurance more affordable while increasing public involvement in risk mitigation and awareness regarding local hazards (California Department of Insurance [CDI] 2022a). See Appendix A for more information regarding the Safer from Wildfire Initiative.

Wildfire risk reduction actions identified in this CWPP (such as home hardening, creating defensible space, and community collaboration) are in alignment with the mitigation actions specified in the Safer from Wildfires initiative. Therefore, implementing actions to reduce wildfire risk, such as those identified in this CWPP, may support homeowners to qualify for insurance discounts. Although the initiative is not yet fully implemented, several insurance companies are offering discounts (for more information visit: https://www.insurance.ca.gov/01-consumers/105-type/95-guides/03-res/Insurers-Currently-Offering-Discounts.cfm).

HOW IS MY COMMUNITY RATED?

Community risk assessments, summarizing hazard and risk information for each WUI community within the Planning Area, are provided in this plan. A team from SWCA Environmental Consultants (SWCA) conducted on-the-ground community risk assessment surveys throughout the Planning Area between October 25 and 30, 2022, using the National Fire Protection Association (NFPA) 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 corresponding descriptive ratings of low, moderate, high, or extreme are available in Appendix D.

WHAT ARE THE STRATEGIES TO ADDRESS WILDFIRE HAZARDS?

Goal 1 of the Cohesive Strategy and the 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:

- Fuel reductions along the perimeter of the communities as well as within communities, including the continuance of proposed projects and reestablishment of prior fuel breaks
- Vegetation treatments along ditches and creeks within and around the communities
- Supporting fuel reduction efforts on private land, including green waste disposal
- Interagency collaboration to facilitate project implantation
- Increasing community capacity to implement projects
- Increasing workforce (firefighting personnel) to carry out projects

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/education and structural ignitability include:

- Addressing dispersed camping by implementing robust education programs, increasing patrols, reducing access points to campgrounds, and installing signage, among other measures
- Developing and promoting wildfire education, including evacuation procedures
- Offering financial assistance for defensible space work to seniors and low-income individuals
- Improving defensible space and structural hardening
- Hosting community awareness events
- Improving home addressing and signposting
- Involving second-home owners and absentee homeowners in wildfire education (defensible space and structure hardening measures)
- Conducting community walkthroughs with fire response organizations
- Addressing combustible debris and rubbish on private property
- Developing a community pre-fire plan
- Upgrading emergency notification systems and wildfire signage

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:

- Creating additional ingress and egress points
- Identifying evacuation routes and shelter-in place locations
- Maintaining dirt roads and trails around the community
- Expanding coverage of Alert California live cameras
- Upgrading equipment and fire response vehicles
- Developing water resources for fire suppression

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—watershed restoration, soil stabilization, and vegetation 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 short-term, temporary housing needs of those displaced during a catastrophic wildfire event.

HOW WILL THE PLAN BE IMPLEMENTED?

The CWPP does not mandate 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 identified in this CWPP will require the use of the action plan (recommendation matrices in Chapter 4) as well as an assessment strategy for completing each project.

WHO WILL LEAD THE IMPLEMENTATION OF THIS PLAN?

Implementation of most projects identified in this CWPP will require the collaboration and cooperation of multiple individuals and entities such as community residents, private organizations (such as LADWP), fire safe councils, tribal governments, and local, state, and federal agencies. However, to ensure that projects move forward, the plan will be governed by the Independence Fire Safe Council with support from Inyo County's Wildfire Preparedness Coordinator.

WHEN DOES THE CWPP NEED TO BE UPDATED?

The CWPP should be treated as a living 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 community and will be critical in maintaining the ideas and priorities of the plan and the communities in the future. Chapter 5 provides an evaluation framework that can help guide the CWPP update process.

CORE TEAM LIST

Name	Organization
Bill Michael	Independence FSC
Tamara Cohn	Independence FSC
Craig Poole	Independence FSC
Nate Reade	Independence FSC
Lance Rosen	BLM
Heather Stone	BLM
Joe Cappello	Independence Volunteer Fire Department
David Haas	CAL FIRE
Carol Snow	CAL FIRE
Matt Edmiston	CAL FIRE
Steven Hynes	CAL FIRE
Donald Clarkson	CAL FIRE
Carl Dahlberg	Fort Independence Indian Reservation
Sean Dahlberg	Fort Independence Indian Reservation
Kristen Pfeiler	Inyo County Wildfire Preparedness Coordinator
Mikaela Torres	Inyo County Office of Emergency Services

Name	Organization
Carma Roper	Inyo County PIO
Cathreen Richards	Inyo County Planner
Matt Kingsley	Inyo County Supervisor, District 5
Jenn Roeser	Inyo County Supervisor, District 4
Chance Traub	USFS Inyo National Forest
Tim Bachman	Inyo County Sheriff's Office
Elsa Jimenez	LADWP
Frosty Matheiu	LADWP
Matthew Paruolo	Southern California Edison
Rich McCrea	Wildland Fire Associates
Tom Nichols	Wildland Fire Associates
Jeff Manley	Wildland Fire Associates
Holly Alpert	Whitebark Institute
Rick Kattelmann	Whitebark Institute
Victoria Amato	SWCA
Montiel Ayala	SWCA
Elizabeth Hitzfelder	SWCA
Time Clute	SWCA

CHAPTER 1 – INTRODUCTION

The United States is facing urgent forest and watershed health concerns. Indeed, the number of annual wildfires throughout the United States has been slightly increasing (58,100 in 2018 and 50,000 in 2019 vs. 59,000 in 2020 and 2021). Similarly, the number of acres burned has been on the rise (Congressional Research Service [CRS] 2022). 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 2022). Communities are seeing the most destructive wildfire seasons in history. In the last 5 years, the 2020 fire season had the most acreage impacted in a single year at 10.1 million acres, and 2017 was the second highest with 10 million acres (CRS 2022). These statistics demonstrate that wildfires are becoming larger and increasingly impactful.

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 and threaten the sustainability of these ecosystems. 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).

As wildfire acreage burned and 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 CWPP is rooted in meaningful collaboration among many stakeholders, including local, state, and federal officials. The planning process involves looking at past fires and treatment accomplishments using the knowledge and expertise of the professional fire managers who work for the various agencies and governing entities in the community. From there, the CWPP ultimately identifies the current local wildfire risks and needs that occur in the community, which is further supported with relevant science and literature from the western region of the United States.

In addition, this document, the 2023 Independence CWPP, reviews, verifies, and/or identifies potential priority areas where mitigation measures are needed to protect from wildfire the irreplaceable life, property, and critical infrastructure in the community. 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 2023 Independence CWPP will only identify 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 values at risk in the local economy. The minimum requirements for a CWPP, as stated in the Healthy Forests Restoration Act of 2003 (HFRA), are (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 2023 Independence 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.

ALIGNMENT WITH THE NATIONAL COHESIVE STRATEGY

The 2023 CWPP is 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).

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. The CWPP incorporates the three primary goals of the Cohesive Strategy and post-fire recovery and serves as holistic plan for fire prevention and resilience.

ALIGNMENT WITH PLANS AND AGREEMENTS

This CWPP is aligned with multiple local, state, and federal planning documents. These documents or 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 Independence CWPP was overseen by the Independence Fire Safe Council (FSC). 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 Independence CWPP. Stakeholder involvement is critical in producing a meaningful document that includes 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 June 28, 2022; the Core Team met for the first time on July 26, 2022; convened again on October 27, 2022; and met for the final time on February 15, 2023.

The Core Team List is provided in the Executive Summary.

PLANNING AREA

The Planning Area includes the town of Independence, the Fort Independence Indian Reservation, the historic Mt. Whitney Fish Hatchery, the communities of Seven Pines and Oak Creek, and the surrounding area (Refer to Figure ES.1 in the Executive Summary).

LAND OWNERSHIP

Land ownership within the communities is varied: Seven Pines is mostly U.S. Forest Service (USFS) land; Independence is mostly Los Angeles Department of Water and Power (LADWP) and private land; the Hatchery is a mix of state, LADWP, Bureau of Land Management (BLM), and private land; Oak Creek is a combination of LADWP, BLM, tribal, and USFS land; and Fort Independence is a mix of tribal and LADWP land (Figure 1.2).

Additional details regarding the Planning Area, such as topography, weather, and vegetation, are provided in Appendix B.

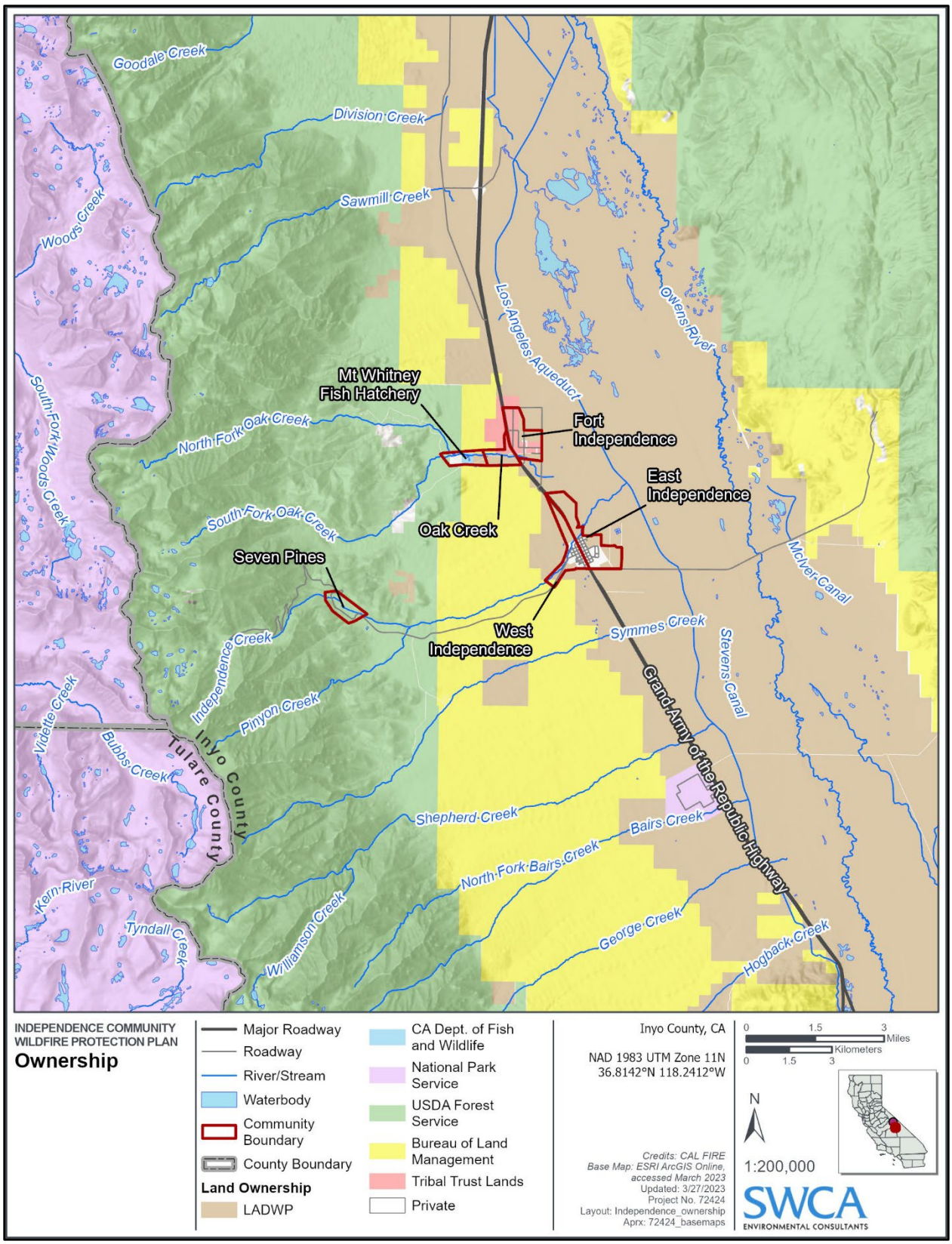

Figure 1.2. Independence land ownership.

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). The draft CWPP was made available for public review from February 27, 2023, through March 27, 2023. In addition to the CWPP report, public meetings and events were held to gather community input. These efforts are described in detail in Appendix H.

Every effort was made to include a broad cross section of the community in the outreach process, and different communication channels were used to engage as many members of the public as possible (e.g., social media postings, email distributions, and in-person activities). All community members were welcomed and encouraged to participate in in-person activities such as the community event at Owens Valley High School. Moreover, all community members were provided multiple opportunities to provide input, such as the community survey, project recommendations review, and CWPP document review.

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 B.

CHAPTER 2 – FIRE ENVIRONMENT

WILDLAND URBAN INTERFACE

The wildland-urban interface (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 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 (Figure 2.1) 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.

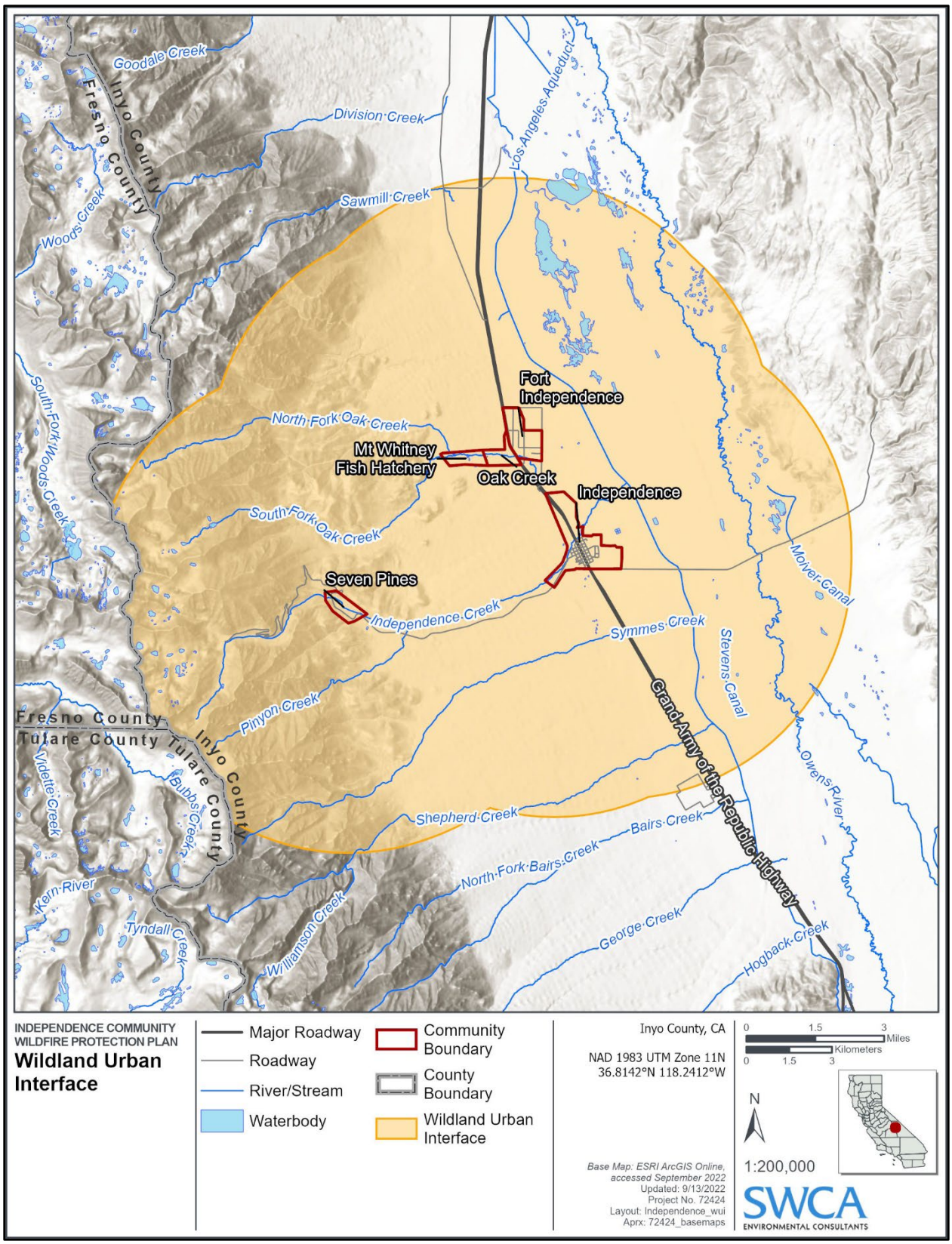

Figure 2.1. Independence WUI delineation.

Given the fuels, topography, and wind patterns in the region, the Core Team collectively determined that the WUI encompass a 5-mile buffer around the communities and extends to the county boundary on the western edge (Figure 2.1).

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 within recent decades is increasing the extent of the WUI throughout the country (Figures 2.2 and 2.3), 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 et al. 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.

WUI 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 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 according to 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.

All of the communities within the Planning Area are designated as WUIs. Under the Inyo County Building Code, all new construction must comply with chapters of California Building Code applicable to WUI fire areas. All properties shall be maintained in accordance with defensible space requirements of the state (Inyo County code: https://library.qcode.us/lib/inyo_county_ca/pub/county_code/item/title_14-chapter_14_08-14_08_140).

The following sections describe important wildfire attributes within and around the WUI in the Planning Area.

Additional Fire Code information is described in Appendix A.

Figure 2.2. Example of the WUI in the Planning Area (Oak Creek).

Figure 2.3. Example of the WUI in the Planning Area (Seven Pines).

Appendix D contains descriptions and hazard ratings accompanied by a WUI delineation map for each community evaluated within the Planning Area. 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 a 5-mile buffer on all sides of the communities to account for the vegetation, topography, and wind patterns.

FUELS AND TOPOGRAPHY WITHIN THE WUI

Most of the fuels within and around the Planning Area are primarily composed of shrubland and grass-shrub fuels; however, the communities are transected by ditches and creeks that carry dense and continuous fuel beds of riparian vegetation, including trees. Other fuel types in the area consist of dead and downed logs along ditches, creeks, and open spaces, and are particularly concentrated in western Independence, where the post-fire debris flows of 2008 deposited many downed trees (California Geological Survey 2012). Moreover, the Seven Pines community is situated at the base of the Sierra Nevada and comprises timber fuels such as oaks and conifers in the center and shrubland fuels around the perimeter.

Sagebrush shrubland communities are primarily characterized by rabbitbrush and blackbrush vegetation and occur at low- to mid-elevations. Shrubland vegetation around the Planning Area is intermixed with sparse grasses and does not typically occur as a homogeneous stand.

Forested communities exist primarily in the higher elevations of the Sierra Nevada in the western portions of the Planning Area. Typically, forested communities are dominated by pinyon-juniper woodlands at the lower elevations, and then transition to red fir forests, Jeffrey pine forests, and mixed-conifer forests at the mid- to higher elevations, and, finally, to white pine (whitebark pine [*Pinus albicaulis*], foxtail pine [*Pinus balfouriana*], limber pine [*Limber flexilis*]) forests in the subalpine zone (USFS 2018).

Map A.1 in Appendix C shows fuels within the Planning Area.

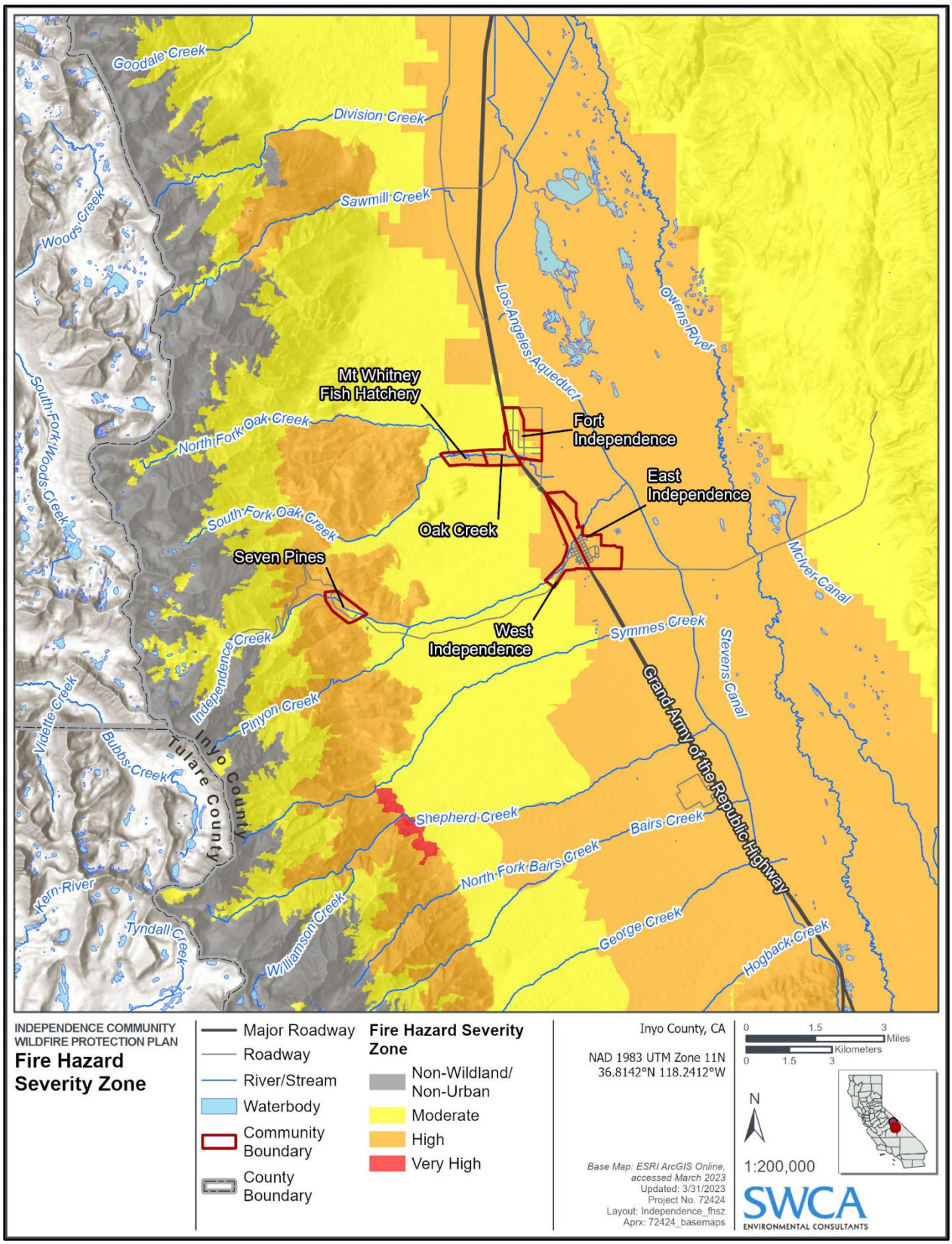

Figure 2.4. CAL FIRE's fire hazard severity zones.

FIRE REGIMES

Fires are characterized by their intensity, the frequency with 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 based on physiographic and ecological characteristics.

The region contains three major biological provinces: the Great Basin, the Mojave Desert, and the Sierra Nevada. The convergence of these biological provinces creates an environment conducive to a wide variety of vegetation ecosystems such as sagebrush shrubland, pinyon-juniper woodland, montane mixed conifer, and dry mixed conifer (USFS 2018). However, the most widespread and common plant communities in and around the Planning Area are sagebrush shrubland mixed with grasses, riparian vegetation, and mixed conifer. The fire regimes of these communities are summarized below.

SHRUBLAND AND GRASSES

Shrubland communities are widely distributed throughout the Great Basin and exist across the Eastern Sierra in arid environments. Recent terminology describes the native vegetation as *Artemisia tridentata* Shrubland Alliance (California Native Plant Society n.d.). These communities are dominated by drought-resistant shrubs, particularly sagebrush vegetation. Sagebrush in the Eastern Sierra comprises all subspecies of big sagebrush, low sagebrush, bitterbrush, and black sagebrush (USFS 2018a). The community is also distinguished by an understory of perennial grasses and forbs within the open spaces between shrubs. The composition of sagebrush shrubland communities is highly varied at both local and regional scales and is oftentimes intermixed with pinyon-juniper vegetation. Sagebrush shrubland is a discontinuous fuel bed that interrupts the occurrence of many large wildfires. Natural fire frequency in these communities range from 32 to 70 years (Kitchen et al. 2013). Historic fires were usually small, high-intensity surface fires that maintained the composition of the community. However, anthropogenic disturbances have altered this regime—the modern fire regime is a short fire-return interval of large, intense fires. Disturbances such as livestock grazing prevent the propagation of native bunchgrasses and allow for invasive species (e.g., cheatgrass) to invade and proliferate. Cheatgrass, a highly combustible fuel, has further contributed to changing the fire regime. Cheatgrass produces an abundance of light, flashy, and continuous fuel, which creates the perfect conditions for frequent fires (USFS 2014). Cheatgrass exists throughout California and is the primary annual grass on sagebrush rangelands in the Owens Valley (University of California, Agriculture and Natural Resources [UCANR] 2019a). The Inyo National Forest has also recorded invasions by cheatgrass (USFS 2018a).

RIPARIAN VEGETATION

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 willows and cottonwoods typically do not recover well from high-intensity fires; contrarily, invasives such as salt cedar, 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. 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). In the Owens Valley, salt cedar has been expanding its range since the middle of the twentieth century (Inyo County Water Department 2023).

JEFFREY PINE FORESTS

On a landscape scale, a mixed-severity fire regime occurs in Jeffrey pine (*Pinus jeffreyi*) communities. The type and severity of fire is contingent upon forest structure, density, and understory composition. While low-severity surface fires are typical in open-canopy forests with sparse understory fuels, higher stand densities and the presence of ladder fuels in the understory enable higher-severity fires. Moreover, fire exclusion has amplified fuel loads and created ladder fuels that may support larger, more severe fires than what was typical under historic fire regimes. The principal carriers of fire in this habitat are surface fuels and litter (grasses, shrubs, small trees, needles, and fallen branches). However, extreme fire weather conditions, in conjunction with dense stands, can result in fire spreading to the canopy to produce a crown fire (USFS 2007).

CLIMATE AND WEATHER PATTERNS

The Planning Area and surrounding environment has an arid climate typical of the Owens Valley (Powell and Klieforth 2000). The geographic location immediately east of the Sierra Nevada experiences minimal precipitation because of the strongly declining precipitation gradient in the lee of the mountains ("rain shadow effect"), occasional strong downslope winds, and warm to hot temperatures except during winter. Relative humidity during the fire season is rarely above 20% and often less than 10%. Basic climate information has been monitored at Independence for well over a century, perhaps because it is a county seat.

Table 1.1. Climate Summaries for Weather Stations in the Planning Area

			Mean Annual Temperature (°F)		
Station	Period of Record	Mean Total Annual Precipitation (Inches)	Max	Min	Mean Annual
Independence	1983–2016	5.21	75.2	44.6	60

Source: Western Regional Climate Center (2022)

July is typically the hottest month of the year in the area, with average July maximum temperatures of about 98ºF at the Independence weather station. December and January are usually the coldest months, with average minimum temperatures of about 28ºF at the Independence weather station (Western Regional Climate Center 2022).

The Planning Area receives relatively little precipitation, because of its location in the rain shadow of the Sierra Nevada. Annual precipitation totals have averaged 5.2 inches at the Independence weather station (see Table 1.1). The greatest monthly total precipitation was 23.9 inches in February 1904. The months of December, January, February, and March receive approximately 67% of the annual precipitation. The summer months of July, August, and September are hot and dry with infrequent precipitation from thunderstorms and receive only approximately 8% of the annual precipitation.

The geographic location of the Planning Area is significant because of downslope winds off the Sierra Nevada immediately to the west. As a result of this topography and regional weather patterns, the

community is particularly at risk of wind-driven wildfires approaching from the west as well as ignitions within the community during windy weather. Additionally, the area also experiences up-valley winds from the south, often occurring in the afternoon (Zhong et al. 2008). These southerly winds could align with topography in the Grays Meadows area to potentially spread wildfires upslope from the campgrounds into the residential cabins in 7 Pines.

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 fire 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 operations, in conjunction with other management actions such as human expansion into wildlands and climate change, have resulted in an imbalance between wildfire and ecosystem interactions (California Department of Fish and Wildlife 2021).

PAST FIRE MANAGEMENT POLICIES AND LAND MANAGEMENT ACTIONS

Beginning in the early 1900s, wildland fire policy leaned heavily toward aggressive suppression. Over the years, other agencies, such as the BLM, the Bureau of Indian Affairs, and the National Park Service, have followed the lead of the USFS and adopted fire suppression as the proper means for protecting the nation from wildfire. As a result, many areas now have excessive fuel buildups, dense and continuous vegetative cover, and tree and shrub encroachment into open grasslands.

RECENT FIRE OCCURRENCE

This section was developed using fire history data from CAL FIRE's Fire and Resource Assessment Program (CAL FIRE 2023. Although the fire history data from CAL FIRE is the most comprehensive digital record of fire perimeters in California, it has its limitations. CAL FIRE states that the earlier data (i.e., prior to 1950) is subject to significant uncertainty due to poor and inconsistent record keeping. In addition, data for some fires may be missing or have incorrect information. This is due to the loss or damage of historical records as well as inadequate documentation (CAL FIRE 2022a). Given the limitations of the data, the fire history analysis below may contain discrepancies.

The fire history dates differ between the charts and the map because the charts contain fire history for the communities and a surrounding 20-mile buffer. The map shows fire history only for the area that is displayed (i.e., less than the 20-mile buffer). It should be noted that the 20-mile buffer captures some of the fires in the western Sierra Nevada, including large fires such as the 2020 Creek Fire. These fires strongly influence the analysis below.

An analysis of the Planning Area's fire history (1934–2021) shows historic fires occurring to the west, north, and south of Independence, with most larger fires occurring along the west (Figure 2.5). Historically, fire events have oscillated, with some decades (1963–2003) experiencing more and other decades less (Figure 2.6). However, the chart shows an uptrend in fire events through the last nine

decades (1930–2020) (see Figure 2.6). Indeed, there has been a steady increase of fire events, human ignitions, and total acreage burned per decade over the last 50 years (Figures 2.7, 2.8, and 2.9). In fact, 75% (232,710 acres) of all acres burned since 1934 have burned in the last two decades (2003–2021) (see Figure 2.8).

Many of the fires in the Planning Area have unknown causes (which are most likely human caused), and human ignitions have increased substantially in the last two decades. Indeed, the recent increase in dispersed camping to the west of Independence has heightened concern among the residents of Independence and Seven Pines since the surge in dispersed camping increases the risk of ignition. It should be noted that many ignitions caused by dispersed camping are not captured in CAL FIRE's database.

Most fires occurred within the period of June through September, which is when high temperatures and hot, dry winds are most frequent (Figure 2.10) and fuels moistures are low and grasses cured out. This trend coincides with California's fire season, which usually occurs between July and November. The region also experiences a fire season in the winter and spring, with a considerable number of fires occurring within the period of February through April (see Figure 2.10). In addition, fire seasons are increasing in length. Climate change acts as a key driver of increased fire season duration due to warmer spring and summer temperatures, decreased snowpack, and earlier spring snowmelt (CAL FIRE 2021a).

A historical account of fire events in Independence reveals that much of early Independence was destroyed by a fire on June 30, 1886, which started inside one of the 38 structures that were consumed when the town was only 20 years old. As the town burned, two ladies removed and thereby saved all the county records from the courthouse before that building was also incinerated (Chalfant 1933).

Contemporary events include the Inyo Complex Fire of 2007, which is the wildfire event that quickly comes to mind among long-term residents of the Planning Area. Lightning from widespread thunderstorms on July 6, 2007, ignited many fires along the eastern escarpment of the Sierra Nevada from Lone Pine to Big Pine. Ten of those fires grew sufficiently to combine with or approach other fires ignited on that same day. The Inyo Complex Fire burned more than 35,000 acres, six homes, and 27 outbuildings over the following 10 days. The portion of the Inyo Complex that burned just west and northwest of Independence is also known as the Oak Fire. During the fire, about 200 people were evacuated from the western side of Independence. The fire also burned the cover of a reservoir that supplied water to Independence, causing it to collapse and contaminate the water. The Inyo Complex Fire was proclaimed a disaster by the State of California, making the county eligible for relief funds (Inyo County and City of Bishop 2017). In July of the following year, very intense rainfall in the burned watershed of Oak Creek generated a debris flow that caused extensive damage along Oak Creek and in Fort Independence (Wagner et al. 2012).

Other fires around the Planning Area include the Fort Fire of 2009 and Winterton Fire of 2011, which were prescribed fires northeast of Fort Independence that burned between 900 and 1000 acres each. The records are not clear about whether either fire burned beyond the prescription boundaries. Another fire named Fort burned 314 acres in 1980 much closer to Fort Independence. The Division (1999, 2450 acres), Hogback (2005, 743 acres), and Sawmill (2000, 322 acres) Fires burned in the Sierra Nevada north of the Planning Area mostly above 4000 feet elevation. Five fires have burned along or near Independence Creek: two named Onion (9,100 acres burn in 1985 and a small fire of 85 acres resulting from an escaped campfire), the 2007 Seven Fire (part of the Inyo Complex), the Rattlesnake Fire of May 2022 that burned about 25 acres, and an unnamed fire in 1984 that burned about 200 acres. Between Independence Creek and George Creek to the south, six other fires ranging in size between 164 and 2,941 acres have occurred in the past seven decades.

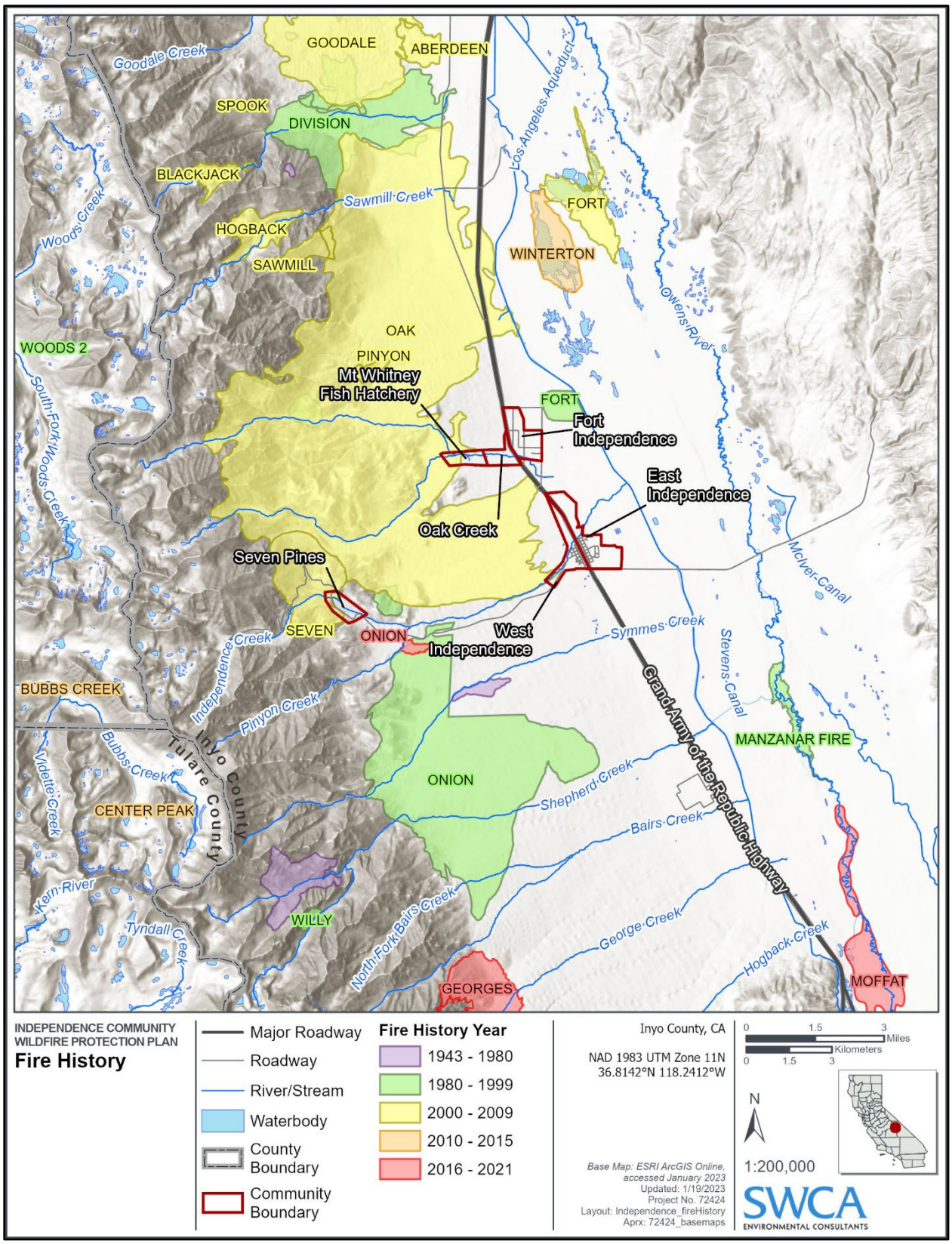

Figure 2.5. Historic fire perimeters for the Planning Area from 1900 through 2020.

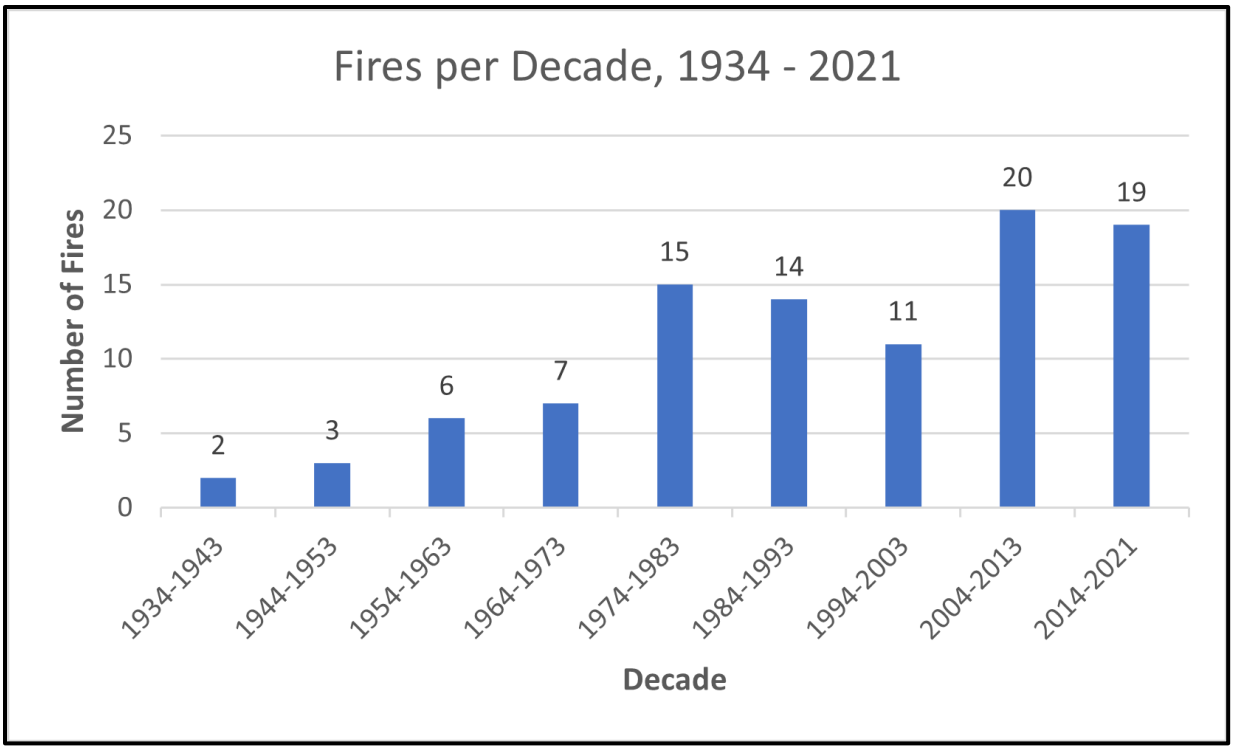

Figure 2.6. Decadal wildfire frequency in the Planning Area (and 20-mile buffer) from 1934 through 2021, based on available data.

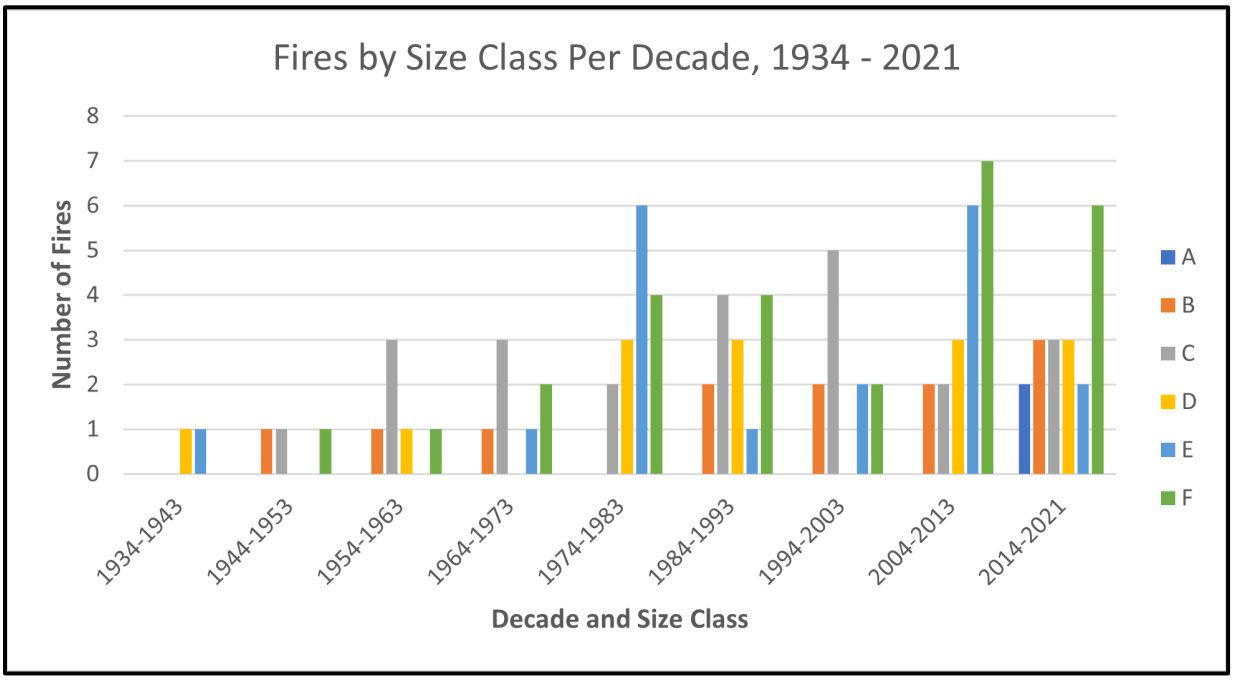

Figure 2.7. Fire size statistics per decade for the Planning Area (and 20-mile buffer) based on fire history data from 1934 through 2021.

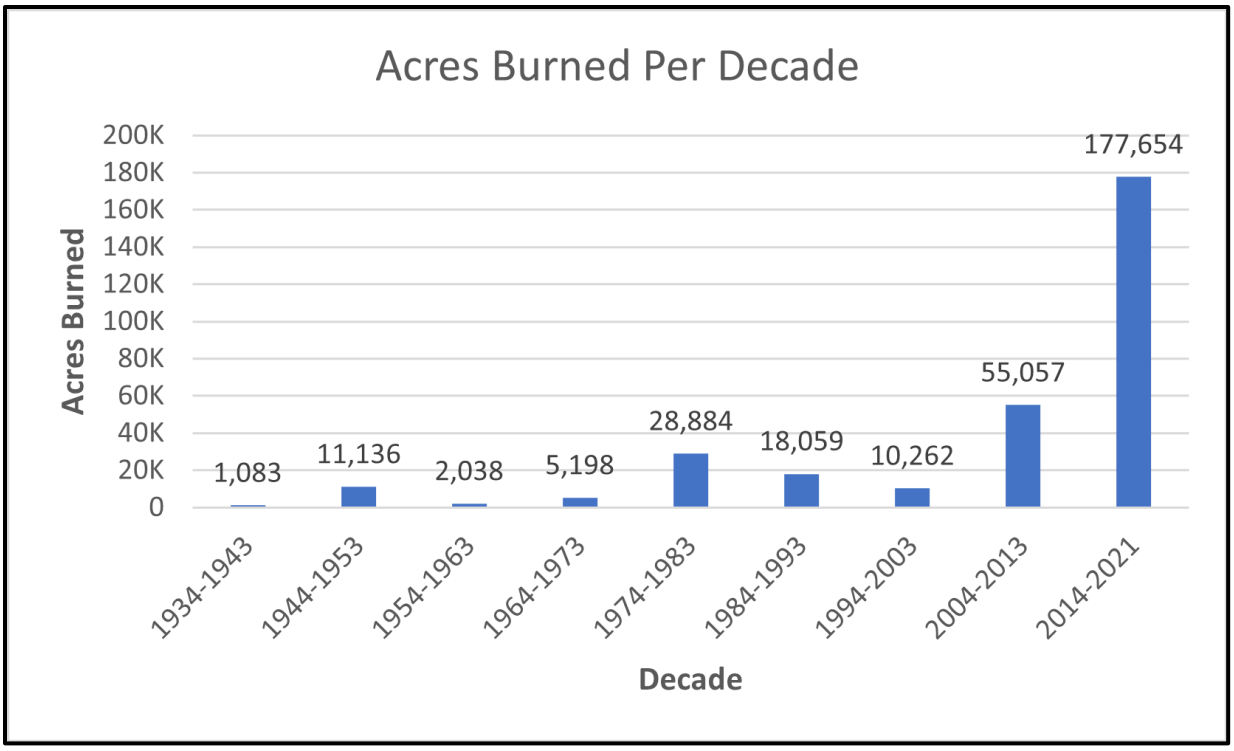

Figure 2.8. Acres burned per decade for the Planning Area (and 20-mile buffer) based on fire history data from 1934 through 2021.

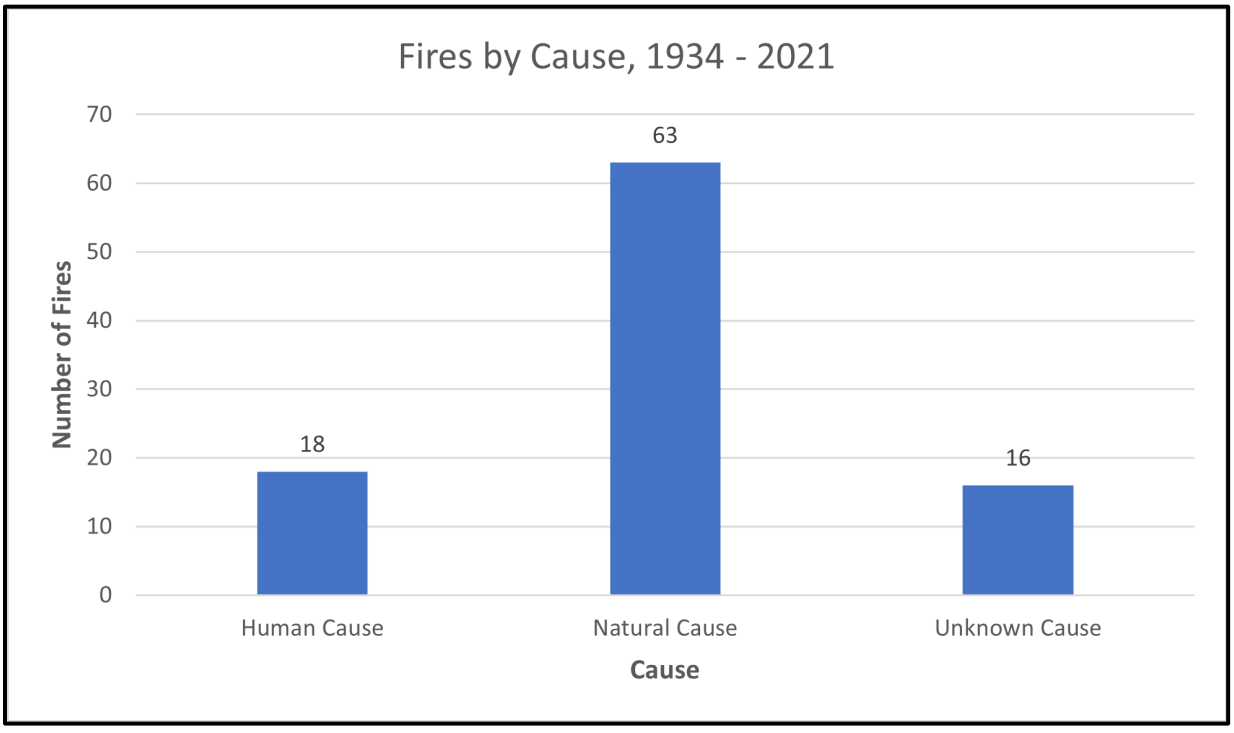

Figure 2.9. Fire causes for the Planning Area (and 20-mile buffer) from 1934 through 2021.

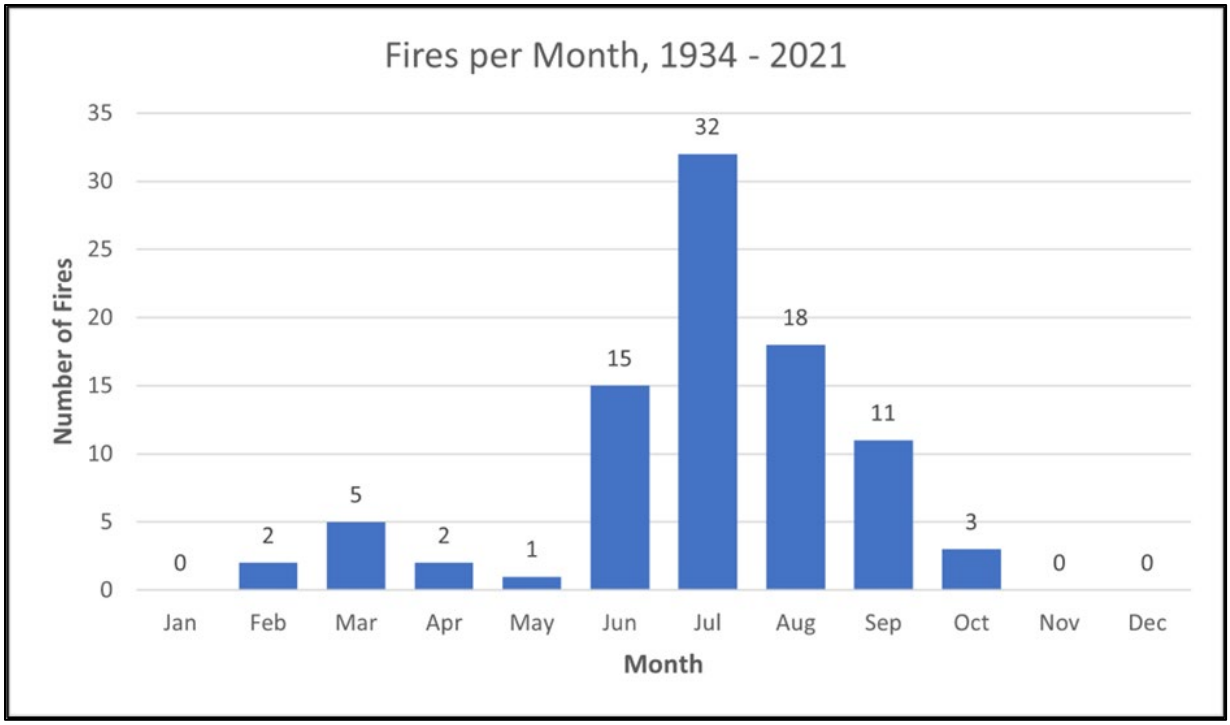

Figure 2.10. Monthly fire frequency in the Planning Area (and 20-mile buffer) based on data from 1934 to 2021.

Besides the Inyo Complex Fire of 2007, recent fires in the Seven Pines Area include the 1973 Seven Pines Fire (Figure 2.11) and the 2021 Robinson Fire (Figure 2.12). Fortunately, no cabins were lost in either of these events.

One of the town's remaining historic structures, the Commander's House built in 1872 at Camp Independence but later moved into town, was almost lost to fire on the afternoon of October 25, 2022. Construction activities intended to protect the structure inadvertently ignited part of the roof, but fortunately, the Independence Fire Department and CAL FIRE were able to extinguish the blaze before it spread (Figure 2.13). During the past decade, several structural fires have started within Big Pine, the next community to the north. Although dramatic wildland fires capture everyone's attention and seemingly pose the highest risk to WUI communities, we must consider the high risk from ignitions within each community.

Figure 2.11. Aftermath of the 1973 Seven Pines Fire.
Source: Craig Poole, Independence FSC

Figure 2.12. Aftermath of the 2021 Robinson Fire in Seven Pines.
Source: Craig Poole, Independence FSC

Figure 2.13. Independence Fire Department and CAL FIRE responding to the structure fire (Commander's House).

FUTURE CHALLENGES

Frequent drought, suppression-based forest management practices, and climate change have interacted to increase forest vulnerability. Removing natural fire from a fire-dependent ecosystem, drought, insects, and diseases have resulted in increased fuel build-up and alterations to vegetation composition. These forest changes can increase the risk of uncharacteristically large high-severity fires (California Department of Fish and Wildlife 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 Westerling et al. (2006), a study of large (>1,000 acres) wildfires throughout the western United States for the period of 1970 to 2003 saw a pronounced increase in fire frequency since the mid--1980s (1987–2003 fires were four times more frequent than the 1970–1986 average). 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). Indeed, recent studies suggest that this trend will continue. Iglesias et al. (2022) found that average fire occurrences in regions of the United States are up to four times larger in size, more extensive, and triple the frequency during the last two decades.

Within the last 10 years, a record number of acres have burned, and numbers have surged since the turn of the century (National Interagency Fire Center [NIFC] 2021a). In 2021, 58,985 fires were reported nationwide, burning well over 7 million acres (NIFC 2021a). Of these, over 2.5 million acres were burned in California, which represents more than a third of all acreage burned nationwide (CAL FIRE 2022b). With increased fires comes increased suppression costs; 2021 beat all previous records, with federal firefighting costs hitting over $4 billion (NIFC 2021b). Indeed, the 2007 Inyo Complex Fire burned more than 35,000 acres, six homes, and 27 outbuildings (Inyo County and City of Bishop 2017). Regarding the 2021 fire season in Inyo County, there were three significant wildfires: Onion Fire in April, west of Independence (85 acres); Inyo Creek Fire in June, near Whitney Portal (more than 600 acres); and

Taboose Fire in September, southwest of Big Pine (more than 10,000 acres). In February 2022, the Airport Fire burned more than 4,000 acres along the Owens River between Bishop and Big Pine.

Impacts of climate change and tree mortality are discussed in Appendix A.

FIRE RESPONSE CAPABILITIES

Planning Decision and Support

Wildfires have continued to grow in size and severity over the last decade, requiring fire managers 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 and assess impacts on ecological processes.

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 (WFDSS 2021). 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.

Fire 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 C, Map C.10). 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.

Additional information regarding local, state, and federal fire response capabilities for the Planning Area can be found in Appendix B.

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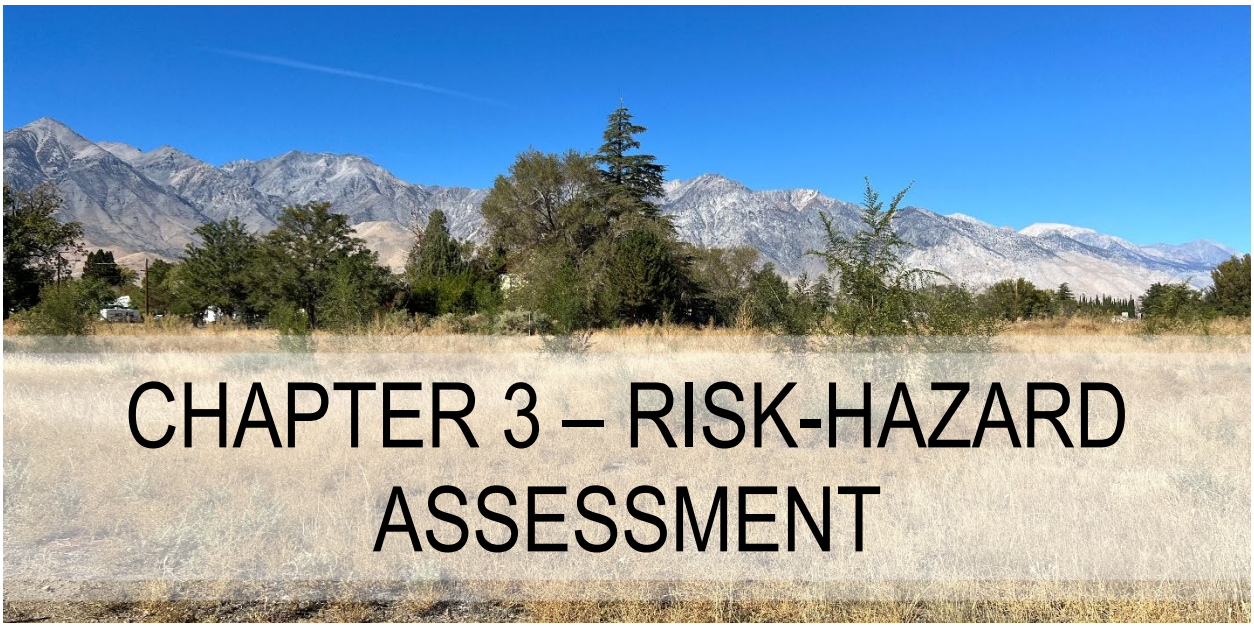

CHAPTER 3 – RISK-HAZARD ASSESSMENT

PURPOSE

The purpose of developing the Composite 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 Independence. Although many definitions exist for hazard and risk, for the purpose of this document these definitions follow those used by the firefighting community:

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

The Composite Risk-Hazard Assessment combines the findings from a Desktop Risk-Hazard Assessment (a geographic information system [GIS] model of hazard based on fire behavior and fuels modeling technology) and a Community Hazard Assessment (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. The fuels reduction treatments can be implemented on both private and public land, so community members have the opportunity to actively apply the treatments on their properties, as well as recommend treatments on public land that they use or care about.

The Inyo County and City of Bishop Multi-Jurisdictional Hazard Mitigation Plan (Inyo County and City of Bishop 2017) lists wildfire as a top priority hazard.

Disclaimer

The purpose of this risk assessment is to provide a community- and landscape-level overview of wildfire risk and is not recommended for use at smaller scales (such as for a property level analysis). It is also not recommended for use in determining insurance rates or policies. This risk assessment is a model, and as such has inherent biases, missing data, and other shortcomings, though every effort has been made to include the best available data and use the most robust scientific processes. Also note that just because an area is shown as high or low risk does not mean that that area will be burned or not burned in a wildfire—a low risk area can still be affected by wildfire if the conditions are right. This risk assessment is also not intended for use during active wildfire events, but rather only as a tool for pre-fire planning. It is not recommended that this risk assessment be used for any other purpose than what is stated here.

FIELD-BASED COMMUNITY HAZARD ASSESSMENTS

Community Hazard Assessments were conducted using the NFPA Wildland Fire Risk and Hazard Severity Form 1144 (see Appendix E). This form is based on the NFPA 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, see www.firewise.org).

The purpose of the Community Hazard Assessment and subsequent 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 Hazard 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. Each area 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 score was given a corresponding adjective rating of low, moderate, high, or extreme.

Community Hazard Assessments for the communities within the Planning Area (Independence, Seven Pines, Mt. Whitney Fish Hatchery, Oak Creek, and Fort Independence) were conducted in October 2022. The community at risk (CAR) hazard ratings from the Community Hazard Assessment are provided in Table 3.1. 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 3.1. Communities at Risk Ratings with Community Hazard Assessment Summary

Community	Risk Rating	Fire Station	Positives	Negatives
East Independence	64 (moderate)	• Independence Volunteer Fire Department • Cal Fire BDU Independence Fire Station	• Reflective street signs • Easily accessible to fire response with wide roads for trucks to turn around • 2 or more roads in and out • Relatively flat, surfaced roads • Reflective street signs • Fire-resistant roofing • Ample waters sources • Community is less than 5 miles from a fire station	• Flammable grass and shrub fuels in northeast section of community • Tree lot not maintained • Flammable shrubs surrounding community • Dead and down logs in irrigation ditches • Defensible space is only 30 to 70 feet • Combustible siding materials • Lack of adequate separation between adjacent structures • Severe fire weather potential • Combustible decks/fencing • Gas and electric lines are aboveground • Exposed propane tanks next to woodpiles • Fire hydrants not easily visible
West Independence	80 (High)	• Independence Volunteer Fire Department • Cal Fire BDU Independence Fire Station	• 2 or more roads in and out • Flat, well surfaced roads • Accessible to fire response, ample ability to turn around (wide roads) • Reflective street signs • Onion Valley Road can function as a fuel break • Fuel loading surrounding town consists of light grass-shrub fuel loading • Fire-resistant roofing • Ample water sources • Fire station is less than 5 miles from community • Structures well-spaced	• Only 30 to 70 feet of defensible space around structures • Exposed propane tanks next to woodpiles • Fire hydrants are not easily visible • Combustible decks and fences • Podetial for severe fire weather • Gas and electric lines are above ground • Combustible siding material • Exposed to shrubland fuels to the west • Dispersed camping is concentrated to the west

SWCA

Community	Risk Rating	Fire Station	Positives	Negatives
Oak Creek	116 (Extreme)	• Independence Volunteer Fire Department • Cal Fire BDU Independence Fire Station	• Roads are flat • Existing street signage is reflective • Fire resistant roofing • Oak Creek runs through community • Only 6–8 homes in community (easier to protect) • Community less than 5 miles from fire station	• Only 1 road in and out • Roads are less than 20 feet wide • Roads are non-surfaced • Flammable vegetation along roads • No turnaround potential for fire trucks • Difficult for fire trucks to access community • No driveway marker • Limited street signage inside community • Heavy debris flows and fuel loading along banks of Oak Creek • Less than 30 feet of defensible space around structures • Steep slopes in community (10%–20%) • Limited separation of adjacent structures • Severe fire weather potential • History of recent fire occurrence • Combustible siding materials • Limited water supply. • Gas and electric utilities are aboveground • Propane tanks exposed to dry fuels

SWCA

Community	Risk Rating	Fire Station	Positives	Negatives
Seven Pines	143 (extreme)	• Independence Volunteer Fire Department • Cal Fire BDU Independence Fire Station	• Street signs present • Small, well-organized community • Independence Creek flowing through center of community • Recent wildfire west of community has reduced fuel loads • Agency coordinated pre-fire planning • Paved road leading up to community • One large turnaround within community	• High fuel loads with needles in community • Flammable shrub fuels lining access roads • Less than 30 feet of defensible space for most structures • Propone tanks exposed to flammable fuels • Steep slopes within and surrounding community • Non-surfaced roads with greater than 5% grade • Fire access is more than 300 feet with only one turnaround • Non-reflective street signs • Limited availability of water sources • Combustible house siding • Combustible roofing material • One road in and out for whole community • Only one turnaround for fire trucks • Community is more than 5 minutes from a fire station • Seasonal cabin use, some with limited home maintenance • Dispersed camping is concentrated to the east

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SWCA

Community	Risk Rating	Fire Station	Positives	Negatives
Fort Independence	95 (High)	• Independence Volunteer Fire Department • Cal Fire BDU Independence Fire Station	• 2 or more roads in and out • Most roads are relatively flat and surfaced • Topography of community is relatively flat • Ample water sources • Community within 5 mi of fire station • Ditch fuels treatment east of community • Multiple ditch buffers	• Limited turnarounds • Road width is between 20 and 24 feet wide • Some roads lined with flammable fuels • Driveway markers not always present • Some dirt roads • Heavy loading of dead/down fuels in community • Many ditches are lined with heavy fuels • Less than 30 feet of defensible space around structures • Severe fire weather potential • Flammable roofing materials • Combustible siding materials • Combustible decks/fences • Poor fire hydrant visibility • Gas and electric utilities are aboveground • Exposed propane tanks
Mount Whitney Fish Hatchery	76 (High)	• Independence Volunteer Fire Department • Cal Fire BDU Independence Fire Station	• Relatively flat, surfaced roads • Class A roof construction • Reflective street signs • Fuels around fish hatchery are well maintained • 70 to 100 feet of defensible space around structures • Fire-resistant roofing • Non-combustible siding material • Community is less than 5 miles from a station	• Only 1 road in and out • Roads only 20 to 24 feet wide • Limited ability for fire trucks to turn around • History of fire occurrence • Severe fire weather potential • Combustible decks/fences that are less than 30 feet from a slope • Limited water sources (requires pumping from a pond) • Gas and electric utilities are aboveground

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COMPOSITE RISK-HAZARD ASSESSMENT INPUTS

A desktop analysis of risks and hazards uses fuels properties, topography, and weather to generate fire behavior modeling outputs: flame length (Map C.2 in Appendix C), fireline intensity (Map C.3 in Appendix C), rate of spread (Map C.4 in Appendix C), crown fire potential (Map C.5 in Appendix C), and fire occurrence density (Map C.6 in Appendix C). These outputs, along with drive time distance from the fire station (Map C.7 in Appendix C), the WUI (Figure 2.1 in Chapter 2), and highly valued resources and assets (Map C.8 in Appendix C), were subsequently used as inputs in the Composite Risk-Hazard Assessment.

Detailed information regarding topography, weather, fire regimes, fire history, and fire response can be found in Chapter 2.

FIRE BEHAVIOR MODELING

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 dry 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, in which the flaming front remains on the ground surface (in grasses, shrubs, small trees, etc.) and resistance to control is comparatively low; 2) crown fire, in which the surface fire “ladders” up into the upper levels of the forest canopy and spreads through the tree crowns, independent of or along with the surface fire, and when sustained is often beyond the capabilities of suppression resources; and 3) spotting, in which 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) spotting can be prolific and resistance to control can be very high. Crown fire and spotting activity have 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 is usually a factor should always be acknowledged.

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 where fuel treatments have occurred 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 should therefore be focused specifically on 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 2020.

FIRE BEHAVIOR MODELS

LANDFIRE

LANDFIRE is a national remote sensing analysis project that provides managers a data source for 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) and Huygens' principle of wave propagation (Anderson et al. 1981); 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 provides fire behavior predictions for a single set of weather inputs only. 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 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 IFTDSS 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 3.2 provides a description of each fuel type.

Map C.1 in Appendix C illustrates the fuels classification throughout the Planning Area.

Field surveys revealed that some fuels were incorrectly classified in the fuel model. Following on-the-ground verification of fuels within and around the Planning Area and Core Team input, the fuel model was calibrated to reflect the type of fuels observed in the vicinity. In detail, fuel models were calibrated to align with expected fire behavior in the region; for instance, if fire was expected to travel at 50 chains per hour and have a flame length of 8+ feet, we assigned a fuel model with those characteristics that was also in accordance with our field observations.

Table 3.2. Fuel Model Classification for the 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).
iv.	**GR4:** Moderately coarse continuous grass, average depth 2 feet. Spread rate very high (50–150 chains/hour); flame length high (8–12 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).
iii.	**GS3:** Moderate grass and shrub load, average depth less than 2 feet. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet).
3.	**Shrubs cover at least 50% of the site; grass sparse to non-existent (Shrub)**
i.	**SH1:** Low fuel load, depth about 1 foot, some grass fuels present. Spread rate very low (0–2 chains/hour); flame length very low (0–1 feet).
ii.	**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).
iii.	**SH4:** Low to moderate shrub and litter load, possibly with pine overstory. Fuel bed depth about 3 feet. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet).
iv.	**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).
v.	**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).
vi.	**SH9:** Dense shrubs, significant fine fuel. 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.	**TU5:** High load conifer litter 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.	**TL1:** Low to moderate load, fuels 1–2 inches deep. Spread rate very low (0–2 chains/hour); flame length very low (0–1 foot).
ii.	**TL2:** Low load, compact. Spread rate very low (0–2 chains/hour); flame length very low (0–1 foot).
iii.	**TL3:** Moderate load. Spread rate very slow (0–2 chains/hour); flame length low (1–4 feet); fine fuel load (0.5 ton/acre).
iv.	**TL4:** Moderate load. Spread rate very slow (0–2 chains/hour); flame length low (1–4 feet).
v.	**TL5:** High load conifer litter. Spread rate slow (2–5 chains/hour); flame length low (1–4 feet).
vi.	**TL6:** Moderate load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet).
vii.	**TL8:** Long needle litter; long needle fuel. Spread rate moderate (5–20 chains/hour); flame length low (1–4 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.	**NB2:** Snow/ice.
iii.	**NB3:** Agricultural field, maintained in non-burnable condition.
iv.	**NB8:** Open water.
v.	**NB9:** Bare ground.

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

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.

Weather

Of the three fire behavior components, weather is the most likely to fluctuate, especially on a daily basis. Accurately predicting fire weather remains a challenge for forecasters. As downslope and upslope winds in the Sierra Nevada, along with rising temperatures, dry fuels in the spring and summer, conditions can deteriorate rapidly, creating an environment that is susceptible to wildland fire. It should be noted that the region also experiences a fire season in the winter. Fine fuels (grass and leaf litter) can cure rapidly, making them highly flammable in as little as 1 hour following changes in relative humidity. Low live fuel moistures of shrubs and trees can significantly contribute to fire behavior in the form of crowning and torching. With high wind, grass and shrub 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 is the fuel moisture files. The initial run of the Risk-Hazard Assessment utilized the IFTDSS Auto 97th modeling parameters, which integrate historic fire weather data from nearby RAW stations. SWCA noted that some of the fire behavior outputs did not reflect the intensity and severity of fire behavior that has been observed during recent fires. Therefore, the Risk-

Hazard Assessment was revised using more extreme live and dead fuel moistures to better align with extreme fire behavior conditions.

FIRE BEHAVIOR MODEL OUTPUTS

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

Flame Length

Map C.2 in Appendix C illustrates the flame length classifications for the Planning Area. Flame lengths are determined by modeling in the FlamMap system using the following inputs: fuels, weather, and topography. Flame length is a particularly important component of the Risk-Hazard 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 and heavy riparian vegetation found along ditches and creeks.

Following the fuel model calibration, flame length increased slightly as areas previously classified as grass or shrub were calibrated to a grass-shrub fuel.

Fireline Intensity

Map C.3 in Appendix C 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 a good 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 to over 6,175 Btu/ft/sec.

The pattern for fireline intensity is similar to flame length in that intensities range from very low (0 Btu/ft/sec) through moderate (100–500 Btu/ft/sec) to high and extreme (greater than 1,000 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 1,000 Btu/ft/sec too severe for direct attack by hand or engine crews.

Following the fuel model calibration, fireline intensity increased slightly as areas previously classified as grass or shrub were calibrated to a grass-shrub fuel.

Rate of Spread

Map C.4 in Appendix C illustrates the rate of spread classifications for the Planning Area.

The rate of spread, or the speed at which fire is moving away from the point of origin, is influenced by the slope. Fire moves at a faster rate uphill than downhill, thus the steeper the slope the faster the rate of spread. Additionally, steep slopes bring the fuels above the fire closer to a growing fire, making them more susceptible to ignition. Another issue with steep slopes is the possibility of burning debris rolling down the hill and igniting fuel below the main fire. This is illustrated in Figure 3.1.

The rates of spread in the area range from 0 chains/hour up to 150 chains/hour (one chain is approximately 66 feet and is a common measure in wildland firefighting). Low rates of spread are associated with timber-dominated areas, while moderate and high rates of spread are associated with grass and shrub fuels and riparian vegetation.

Following the fuel model calibration, rate of spread decreased slightly as areas previously classified as purely grass were calibrated to a grass-shrub fuel.

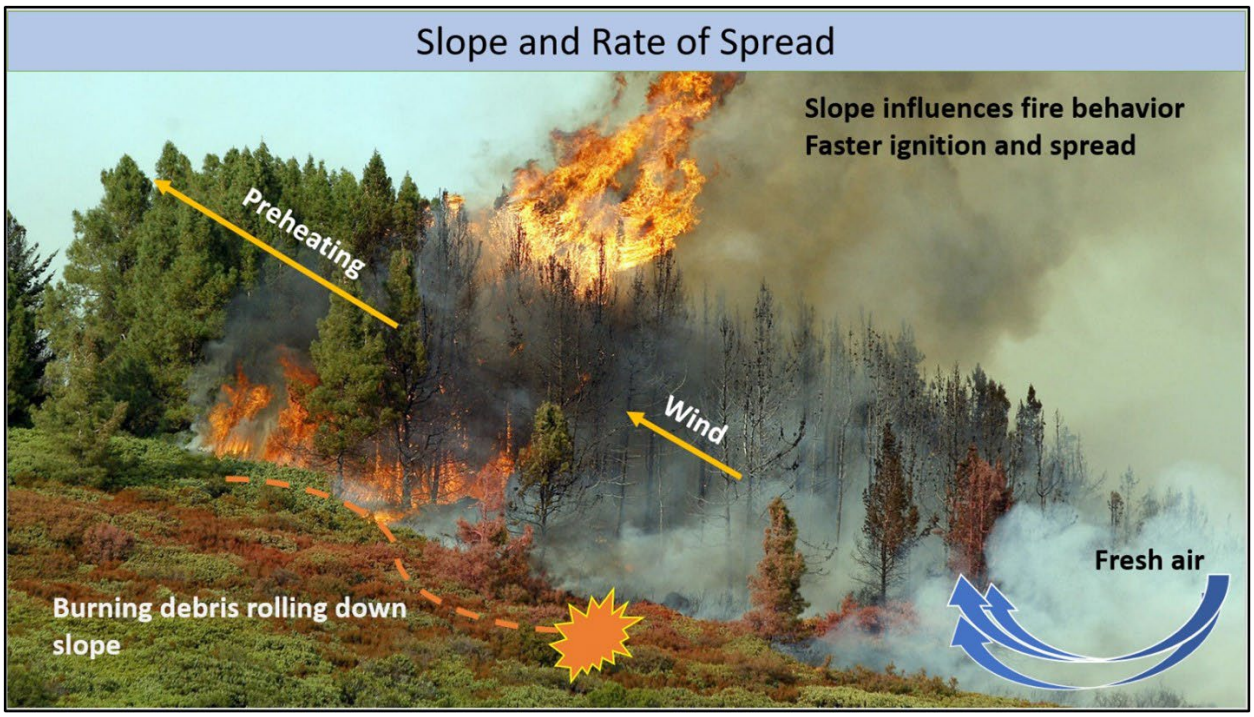

Figure 3.1. Effect of topography on fire behavior.

Crown Fire Potential

Map C.5 in Appendix C illustrates the range of crown fire activity from surface fire (in grass-dominated areas) to passive and active crown fire (in riparian fuel beds). Since the fuel calibration focused on changing grass to grass shrub fuels, crown fire activity stayed the same.

Fire Occurrence/Density of Starts

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 they show the location of fires within the Planning Area from 1934 to 2021. Fire history data was used to determine the location where fires tend to occur more often. Map C.6 (Appendix C) shows the density of fire events within the Planning Area and reveals a higher incidence of fire events to the west and northwest of Independence. The fire history map (Figure 2.6 in Chapter 2) and fire occurrence density map (Map C.6 in Appendix C) are used to provide information on areas where fires are prevalent and hence could be more prone to fire in the future.

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 data sets 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 data sets, 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 data set and evaluate an output value derived from each cell value of the overlaid data set in combination with the weighted assessment. In a Weighted Sum Model, the weighted values of each cell from each parameter data set are added together so that the resulting data set 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, 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 data sets.

As shown in Figure 3.2 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 data sets, 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 data sets and used the edited fuels and landscape file to create custom fire behavior outputs.

Next, in Esri ArcGIS Pro, we processed the fire history, fire station, WUI, and HVRA data sets 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).

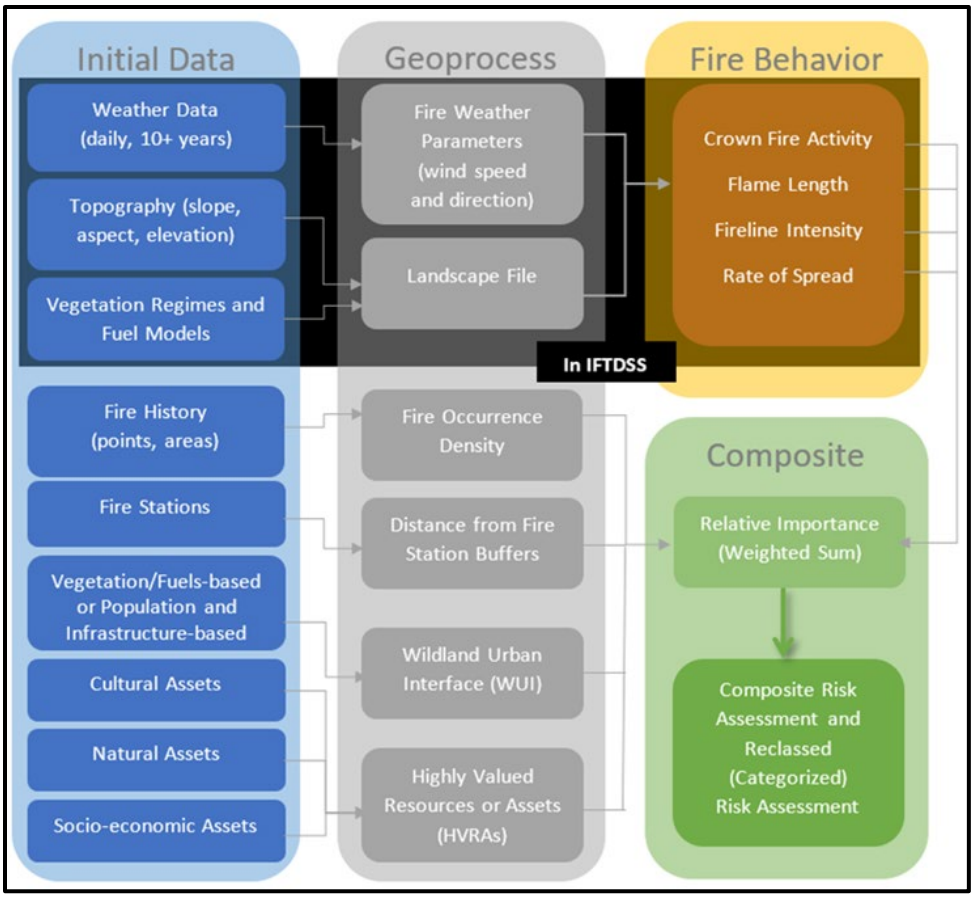

Figure 3.2. Composite Risk-Hazard Assessment breakdown.

Finally, we used ArcGIS Pro to run a weighted sum raster process to add all the inputs together. Risk assessment inputs were assigned weights according to their significance and Core Team input, and all eight inputs were weighted equally due to their potential influence on wildfire risk (Table 3.3).
The distance from the nearest fire station(s) to the community typically determines fire response times. The WUI and highly valued resources designate areas that constitute life, property, and critical infrastructure. Lastly, fire occurrence and fire behavior characteristics (crown fire activity, fireline intensity, flame length, and rate of spread) determine where a fire is likely to occur and the type, intensity, and speed at which the fire spreads.

COMPOSITE RISK-HAZARD ASSESSMENT RESULTS

The Composite Risk-Hazard Assessment modeling approach uses a weighted sum model, which “stacks” geographically aligned data sets and evaluates an output value derived from each cell value of the overlaid data set in combination with the weighted assessment. In a weighted sum model, the weighted values of each pixel from each parameter data set are added together so that the resulting data set 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. 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. Figure 3.3 illustrates the individual data sets and the relative weights assigned within the

modeling framework. Table 3.3 shows the same data sets and weights but includes the data source. These include fire behavior parameters, fire occurrence density, highly valued resources and assets (HVRA), WUI, and distance from fire stations. Figure 3.4 is the Composite Risk-Hazard Assessment for the Planning Area and classifies the Planning Area into low, moderate, high, and extreme risk categories.

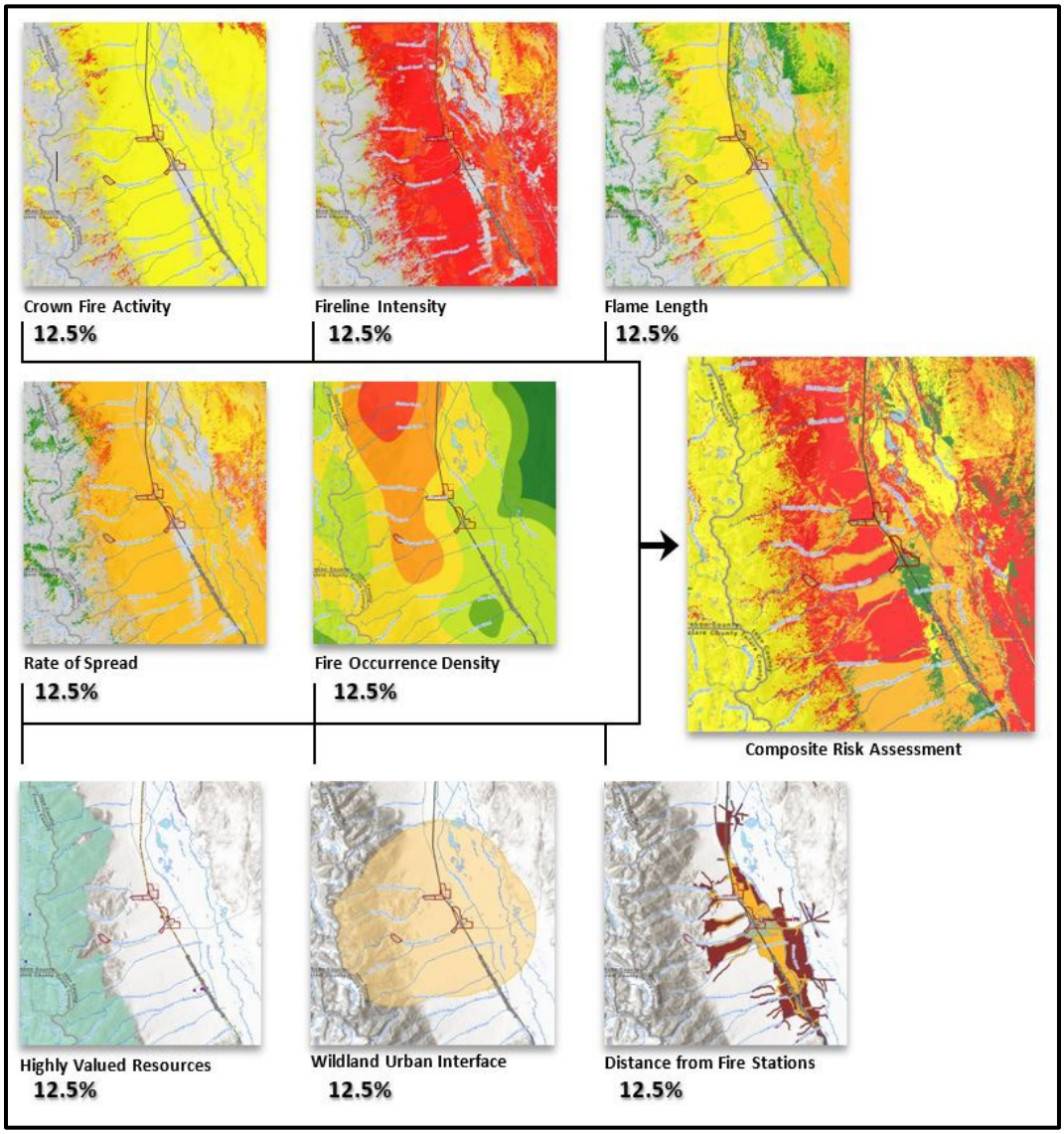

Figure 3.3. Composite Risk-Hazard Assessment overlay process.

Table 3.3 Risk Assessment Inputs, Sources, and Weights

Risk Assessment		
Inputs	**Source**	**Weight**
Flame length	IFTDSS, LANDFIRE	12.5%
Rate of spread	IFTDSS, LANDFIRE	12.5%
Fireline intensity	IFTDSS, LANDFIRE	12.5%
Crown fire activity	IFTDSS, LANDFIRE	12.5%

Risk Assessment		
Inputs	**Source**	**Weight**
Fire occurrence density	CAL FIRE	12.5%
Highly valued resources and assets	Inyo County GIS and IFTDSS	12.5%
Wildland urban interface (WUI)*	Delineated according to fuels and topography	12.5%
Distance from fire stations†	Fire stations from IFTDSS	12.5%

*We used a 5-mile buffer based on Core Team guidance regarding wind, fuels, and topography in the region.

†Distance from fire stations was partitioned in 5-, 10-, and 15-minute drive time intervals; 5-minute (rated 0), 10-minute (rated 1), 15-minute (rated 2), and >15-minute rated a 3. We used the ESRI tool—generate service areas—and configured the analysis for access for emergency vehicles.

Overall, the Composite Risk-Hazard Assessment (Figure 3.4) shows high and extreme risk areas around and within all the communities. However, extreme-risk areas are particularly concentrated within and around Seven Pines, to the west and east of Independence, and around the perimeters of Oak Creek, Mt. Whitney Fish Hatchery, and Fort Independence.

Moreover, discussions with local experts revealed that fires in the region are driven by strong west and southwest winds (and occasionally, north) and that the region has a history of fires along riparian corridors. Indeed, the Oak and Independence Creeks carrying riparian fuel beds into Fort Independence and Independence, respectively, are classified as extreme risk.

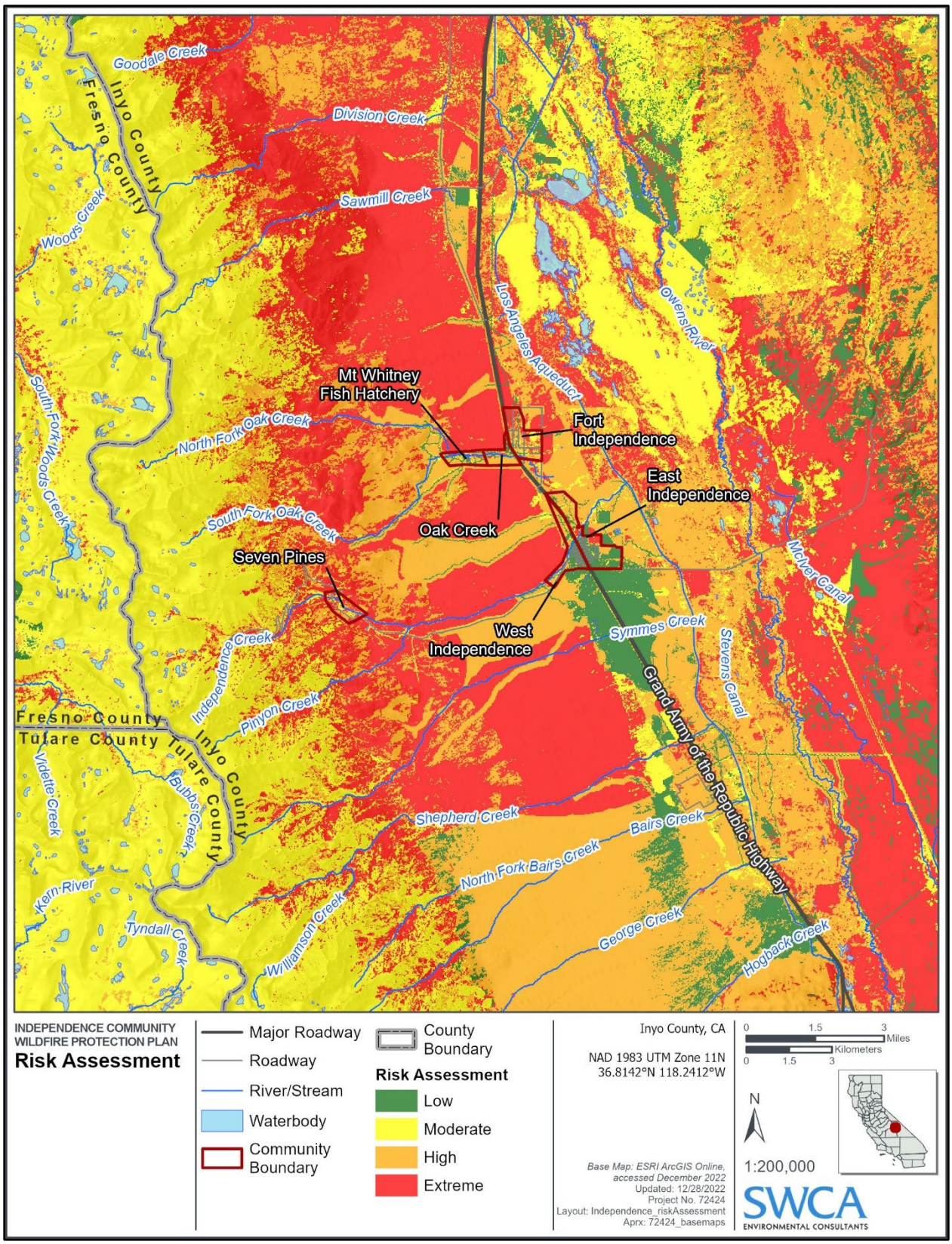

Figure 3.4. Composite Risk-Hazard Assessment.

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 values at risk (VARs) from wildland fire. These data are also supplemented with highly valued resources and assets (HVRA) data, which is a data set that is being gathered nationwide and available through the IFTDSS. The public was encouraged to provide additional VARs during the public outreach period, via the story map survey link. 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. It is important to note that although an 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.

NATURAL VALUES AT RISK

The CWPP Planning Area and the adjacent Inyo National Forest have 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 communities in the Planning Area have emphasized the importance of protecting natural/ecological values to the general public (Figure 3.5). Examples of natural values identified by the public and the Core Team include the following:

- Public land (e.g., Inyo National Forest, BLM lands)
- Trail systems (e.g., Baxter Pass)
- Agricultural land
- Scenic viewsheds
- Wildlife habitat and sensitive species
- Watersheds and preservation of water quality for the communities
- Wilderness areas (e.g., John Muir Wilderness Area)

Figure 3.5. Example of a natural VAR, Independence Creek.

SOCIOECONOMIC VALUES AT RISK

Social values include population, recreation, infrastructure, and the built environment (Figure 3.6). Socioeconomic values are of heightened concern when the state of the local economy is partially dependent on said resource. For instance, the closure of designated campgrounds due to wildfires can reduce revenue generated by outdoor recreation.

The entire communities of Independence, Fort Independence, Seven Pines, Oak Creek, and Mt. Whitney Hatchery fall within the WUI. Examples of socioeconomic values include the following:

- Communications infrastructure (e.g., cell phone, weather stations, and radio towers)
- Tourism values (e.g., restaurants, recreational facilities)
- Owens Valley High School
- Public safety infrastructure
- Highways
- Government buildings
- Mt. Whitney Fish Hatchery
- Tribal administrative buildings
- Tribal Travel Plaza and Casino
- Care homes, senior housing, day care, and other group homes
- Water storage tanks
- Seven Pines cabins
- Recreation sites (e.g., campgrounds)
- Water conduits and irrigation ditches
- Critical infrastructure (e.g., power lines)

Figure 3.6. Example of a socioeconomic VAR, the Mt. Whitney Fish Hatchery.

CULTURAL VALUES AT RISK

Many historical landmarks are scattered throughout Planning Area. Particular cultural VARs that have been identified by the Core Team and the public in the CWPP Planning Area are the following:

- Eastern California Museum
- Independence Cemetery
- Commanders House
- Churches
- Camp Independence Parade Ground
- Historic and cultural landscapes of tribal significance
- Historic trails
- Archaeological sites

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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. Post-fire response and rehabilitation information can be found in Appendix K.

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.

Recommendation matrixes 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 (California Forest Management Task Force [CA FMTF] 2021) wherever possible.

COHESIVE STRATEGY GOAL 1: RESTORE AND MAINTAIN LANDSCAPES

Goal 1 of the Cohesive Strategy and the 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.

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

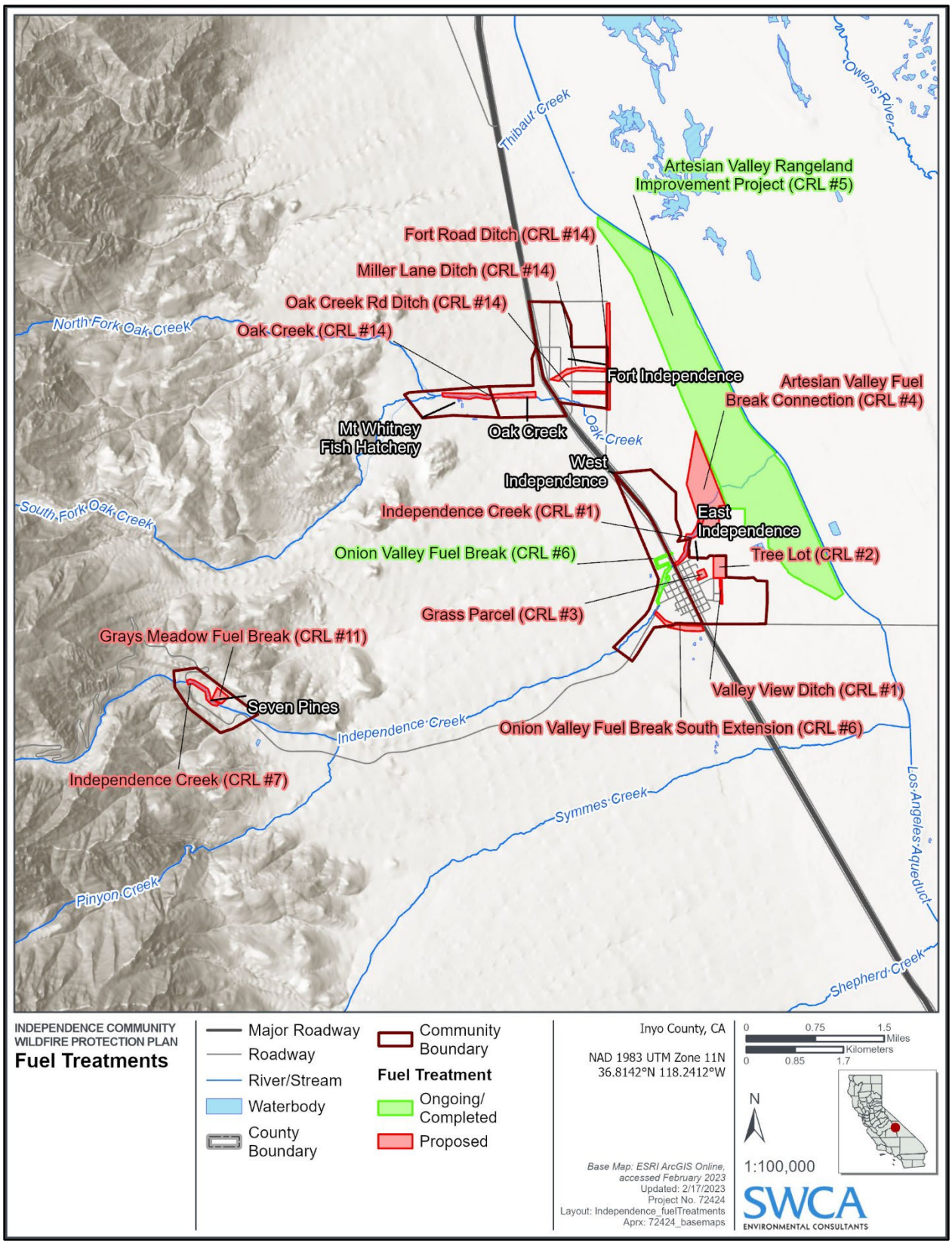

Figure 4.1. Ongoing, planned, and proposed fuels treatments in the Planning Area. Note: the "CRL #" text refers to the Project ID in Table 4.1.

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.

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 protect structures (defensible space) as the top priority, 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). The emphasis of each of these treatment types is unique. Proximate to structures, the recommendations focus on reducing fire intensity and fire spread rates 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.

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 those areas. Tables 4.1, 4.2, and 4.3 also address the requirement for an action plan and assessment strategy by providing monitoring guidelines and a timeline for implementation. This timeline is obviously dependent on available funding and resources, as well as National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) protocols for any treatments pursued on public land. See Figures 4.2 and 4.3 to view the CEQA process for CalVTP implementation and the CalVTP treatable landscape, respectively. It should be noted that the CalVTP process is not necessarily restricted to the treatable landscape. Lands outside of the treatable landscape area may also qualify with proper paperwork and justification. The CalVTP Final Programmatic Environmental Report is applicable to projects at least partially within the SRA, including projects on private land, if they receive state or local government grants for vegetation treatment. It should also be noted that CalVTP is not the only option available to comply with CEQA requirements; project-specific negative declarations or mitigated negative declarations may also be employed.

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). A compilation of detailed descriptions of fuels treatment types and methods, including defensible space practices and larger-scale landscape projects, is housed in Appendix J.

When possible, simultaneously planning for the management of multiple resources while reducing fuels will ensure that the land remains viable for multiple uses in the long term. The effectiveness of any fuel reduction treatment depends on the degree of maintenance and monitoring that is employed. Monitoring will also ensure that objectives are being met in a cost-effective manner.

The treatment list is by no means exhaustive and serves to provide a baseline of required projects 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.

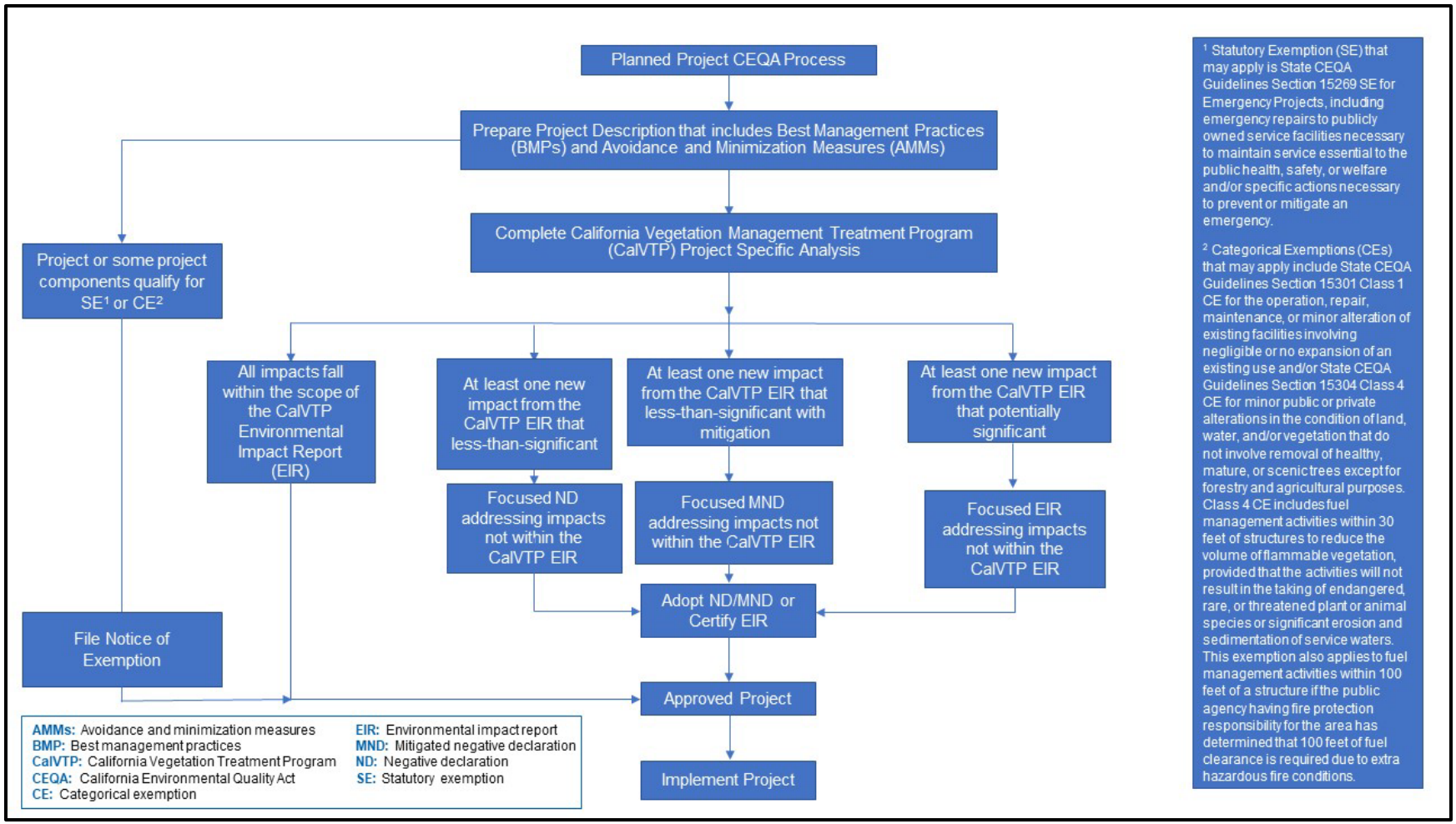

Figure 4.2. CEQA process for CalVTP implementation.

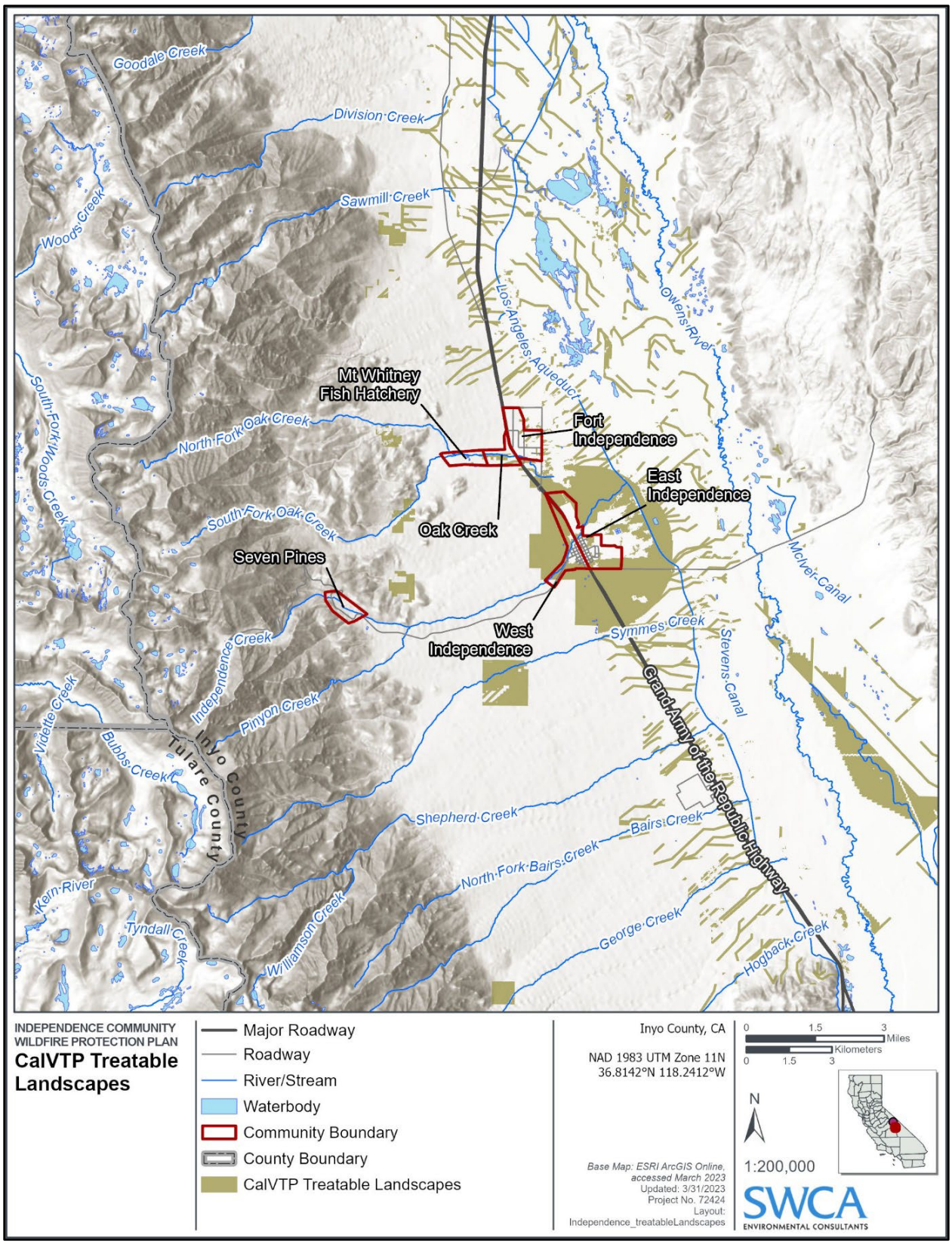

Figure 4.3. CalVTP treatable landscape.

Ongoing and Proposed Fuels Treatments in the Planning Area

As previously stated, fuel treatments are an effective means of reducing fire risk to communities in the WUI. Fuel treatments such as mastication, thinning, prescribed burning and removal of dead woody material serve to reduce fuel loading and will diminish potential fire behavior. For example, reducing ladder fuels minimizes transmission of fire from the surface into the crowns, and tree thinning increases the distance between tree crowns, which will help reduce the potential for crown fires and extreme fire behavior. In addition, fuels treatments enhance firefighter safety and increase the efficiency of fire suppression actions.

CAL FIRE and Independence FSC have been proactive in planning and implementing fuel breaks within the Planning Area. Figure 4.1 above shows the ongoing proposed fuels reductions projects in the Planning Area. The Onion Valley fuel break was recently completed through a combination of manual treatment, mechanical treatment (chipping), and pile burning and included treatment on LADWP land (Figure 4.4). The Artesian rangeland improvement project, which falls entirely within LADWP land, is in progress and consists primarily of prescribed burning, with minor amounts of manual and mechanical treatments. In addition, the Core Team and the risk-hazard assessment identified several areas within the Planning Area as priority areas for fuel reduction, including treatments along ditches and creeks and other concerning areas (e.g., upper Grays Meadows, Oak Creek, around the perimeter of Fort Independence and the northeast perimeter of Independence) (see Figure 4.1). Please refer to Figure 4.1 and Table 4.1 for all the projects identified as a high priority for the Planning Area.

Figure 4.4 The Onion Valley fuel break on the west side of Independence.

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Table 4.1. Recommendations to Create Resilient Landscapes (Fuel Treatments)*

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
CRL #1		H	Fall 2024	Selective thinning and removal of dead and downed vegetation, particularly light fuels (small branches, twigs, dead brush) along ditches and creeks. Consider selective and strategic removal of larger dead logs to enhance firefighter access. Refer to Figure 4.1	Along ditches and creeks, focusing on Valley View Ditch	Lessee, CDFW, USFS, BLM, LADWP (to grant access and to coordinate)	• Work with CDFW to determine feasible projects • Treatment methods could include hand thinning and prescribed fire when appropriate • Consider creating breaks for fire apparatus access	• Limit the spread and intensity of wildland fire and increase access to water resources through strategic placement of fuel breaks • Provide for safe and effective wildfire response capabilities	• Frequent maintenance since riparian vegetation grows quickly	• CAL FIRE Forest Health Grants • California EPA Loans and Grants • U.S. Forest Service Community Wildfire Defense Grant (USFS CWDG) • California Climate Investments Fire Prevention Grant Program (CAL FIRE) • LADWP can provide letters of support for grant applications
CRL #2		H	Winter 2023	LADWP to continue with scheduled maintenance of the tree lot (LADWP has the responsibility and is managing the tree lot) Refer to Figure 4.1	Tree lot	LADWP, Inyo County	• Inyo County Wildfire Preparedness Coordinator to lead engagement with LADWP • Provide public access to firewood from the woodlot, prioritizing low-income households and seniors • Manage the tree lot for multiple objectives (e.g., public use, wildlife habitat, fire risk reduction) • Identify a collaborative planning & management team that includes LADWP and community members to maintain healthy trees • Consider contracting with local, knowledgeable individuals or businesses to conduct semi-annual clean up or work • Conduct a community survey to determine the desired condition for the tree lot	• Enhance wildlife habitat and community green space • Balance the reduction of hazardous fuels with the protection of wildlife habitat	• Yearly maintenance	Not applicable
CRL #3		H	Winter 2024	Work with the lessee to reduce dry grass and shrub fuel loading by irrigation or grazing Refer to Figure 4.1	Grass lot parcel by North Clay and Market Street	LADWP (to coordinate) /Lessee, Inyo County,	• Implement grazing plans to reduce the height and fuel loading of dry grass and remove weeds and/or establish irrigation to regreen the parcel • Work with LADWP and lessee to ensure that the vegetation management requirements in the LADWP lease agreement are being followed • Collaborate with the lessee to determine priorities	• Reduce fuel loading within the community	• Yearly maintenance	Not applicable
CRL #4		H	Winter 2025	Install a fuel break to connect CAL FIRE's Artesian rangeland improvement project to the alfalfa fields Refer to Figure 4.1	Independence east	LADWP (to grant access and to coordinate), Zack Smith (rancher), CAL FIRE	• Coordinate fuel reduction efforts between LADWP and private landowners	• Reduce fuel continuity within the community and create resilient landscapes	• Yearly maintenance	• CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC) • LADWP can provide letters of support for grant applications

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
CRL #5	Ongoing	H	According to project schedule	Continue implementation of the Artesian Valley Rangeland Improvement Project Refer to Figure 4.1	East of Independence and Fort Independence	LADWP (to grant access and to coordinate), CAL FIRE	• Continue executing project plan.	• Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI	• As scheduled	• CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC)
CRL #6	Ongoing	H	Winter 2024	Maintain the Onion Valley Rd fuel break and extend it around the southwestern corner of town to U.S. Highway 395 Refer to Figure 4.1	Northwestern and southwestern portions of Independence	LADWP (to grant access and to coordinate), CAL FIRE	• Hire contractor or CAL FIRE to do hand thinning (85% reduction) • Work with wildlife non-profit organizations to ensure that projects align with wildlife habitat objectives	• Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI • Balance the reduction of hazardous fuels with the protection of wildlife habitat	• Yearly maintenance	• CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC) • LADWP can provide letters of support for grant applications
CRL #7		H	Winter 2024	Reduce fuel loading and ladder fuels along riparian corridor as well as other key areas Refer to Figure 4.1	Seven Pines	Inyo National Forest, I Cabin Owners Association, CDFW, Independence Volunteer Fire Dept.	• Independence FSC and Cabin Owners Association to work with USFS to identify hazard and implement treatments • Look for opportunities to open natural breaks in vegetation along the creek, particularly to the east of Seven Pines (where dispersed camping exists) and west (downslope from Onion Valley Road) • Investigate feasibility of clearing light timber litter along the creek • Explore feasibility of reducing fuel loads along Seven Pines Road • Investigate opportunities to reduce ladder fuels in strategic areas (e.g., near cabin tracts and along the creek) • Consider trimming brush and low hanging branches back along the dirt roads inside the community • Identify projects that align with oak protection (e.g., post-fire debris flow oak replanting) • USFS to investigate potential NEPA categorical exemptions that apply for fuels reduction projects	• Protect life and property by mitigating fuels • Provide defensible space for firefighters protecting structures • Ensure the protection of vulnerable ecosystems and values at risk	• Yearly review and maintenance	• CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC)
CRL #8	M	Winter 2025	Develop restoration projects that serve to enhance creek and habitat health	Fort Independence, Oak Creek, Mt. Whitney Fish Hatchery, Independence Creek	Fort Independence Tribe, BLM, and LADWP (to grant access and to coordinate), Independence FSC, CDFW, USFS	• Design fuels reductions projects that align with land management objectives, e.g., oak tree and sensitive species protection • Consider selective thinning and removal of dead and downed vegetation, particularly light fuels (small branches, twigs, dead brush) • Consider selective and strategic removal of larger dead logs to enhance firefighter access • Work with private property owners in Oak Creek	• Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI • Ensure the protection of vulnerable ecosystems and values at risk	• Yearly review	• California EPA Loans and Grants • CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC) • LADWP can provide letters of support for grant applications

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Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
CRL #9		M	Fall 2025	Investigate opportunities to implement fuels reduction projects upstream of the planned reservoir to protect water resources	Fort Independence	Fort Independence Tribe, BLM, and LADWP (to grant access and to coordinate), CDFW	• Work with CDFW to determine feasible projects • Select strategic locations for optimal fuels treatments effectiveness, e.g., reduce fuel loading near slopes situated adjacent to catchments to limit intense fire behavior	• Improve the protection of water resources at risk • Create resilient landscapes and address potential for extreme wildfire behavior in and around water resources	• Yearly	• California EPA Loans and Grants • CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC) • LADWP can provide letters of support for grant applications
CRL #10		M	Winter 2025	Develop a vegetation management plan	Oak Creek, Mt. Whitney Fish Hatchery	Fort Independence, LADWP, private homeowners, BLM, USFS and CDFW	• Create a vegetation management plan for the area that emphasizes watershed health, wildlife habitat protection, and hazardous fuel management • Establish a maintenance schedule	• Ensure the protection of vulnerable ecosystems and values at risk • Balance the reduction of hazardous fuels with the protection of wildlife habitat	• Revise plan every 5 years	• California Climate Investments Fire Prevention Grant Program (CAL FIRE) • USFS CWDG Grants • BRIC • LADWP can provide letters of support for grant applications
CRL #11		H	Winter 2024	Reestablish the Upper Grays Meadows fuel break Refer to Figure 4.1	Seven Pines	USFS and Cabin Owners Association	• USFS to prioritize the NEPA permitting process for the project due to the high prevalence of dispersed camping and high fire risk in the area • USFS to investigate potential NEPA categorical exemptions that apply for the reestablishment of fuel breaks	• Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI. • Protect life and property by mitigating fuels • Provide defensible space for firefighters protecting structures	• Yearly maintenance	• USFS CWDG Grants • CAL FIRE Grant Programs • BRIC • LADWP can provide letters of support for grant applications
CRL #12		H	Winter 2024	Host chipper days for green waste disposal	All communities	Inyo County, BLM, USFS, CAL FIRE, Fort Independence	• County to investigate how to acquire, rent, or borrow a chipper from BLM, USFS, or CAL FIRE • Independence FSC to coordinate/establish chipper days for the communities • Fort Independence Tribe to acquire a chipper and explore options to collaborate with Independence for green waste disposal efforts • County to acquire a chipper, splitter, and other equipment needs to assist defensible space efforts • Consider liability concerns if trained personnel are not on-site to operate equipment • Focus efforts on assisting socially vulnerable populations	• Support community defensible space efforts • Reduce fuel loading within the community	• Springtime, yearly	• CFSC Grants • Firewise Grants • CAL FIRE Grant Programs • USFS CWDG
CRL #13		H	Winter 2023	Continue to offer green-waste voucher program	Independence, Seven Pines	Independence FSC, Inyo County OES	• Use existing funding source and identify new sources	• Support community defensible space efforts	• In the spring, prior to the fire season	• CFSC Grants • Firewise Grants • USFS CWDG

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Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources

CRL #14		H	Winter 2024	Address fuel loading in Fort Independence and surrounding area (Mt. Whitney Fish Hatchery and Oak Creek)
				Refer to Figure 4.1
					Fort Independence	Fort Independence, LADWP (to grant access and to coordinate) /lessee, CDFW, BLM, USFS	• Create and maintain proper clearance along roadways (Fort Road, Miller Lane, and others)
							• Develop a community-wide vegetation management program to address dead and dying trees and brush
							• Implement defensible space standards to manage trees and brush on private properties
							• Install fuel breaks around residential perimeters and critical infrastructure (tribal administrative headquarters, dispensary, Oak Creek, etc.)
							  ○ Investigate viability of mimicking the Onion Valley Road fuel break
							• Reduce fuel loading along creeks and ditches
							  ○ Selective thinning and removal of dead and downed vegetation, particularly light fuels (small branches, twigs, dead brush); consider selective and strategic removal of larger dead logs to enhance firefighter access
							• Install fuel breaks around the Mt. Whitney Fish Hatchery on the north side (between the hatchery building and Oak Creek)
								• Protect life and property by mitigating fuels
								• Support community defensible space efforts
								• Reduce fuel loading within the community
								• Enhance ingress and egress
									• Yearly assessment	• USFS CWDG Grants
										• CAL FIRE Grant Programs
										• BRIC
										• CFSC Grants
										• Firewise Grants
										• LADWP can provide letters of support for grant applications

*See Appendix A to consult relevant regulations and past planning efforts

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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 the 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 continually 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 improve public education could include increasing awareness about fire department response and resource needs; providing workshops at 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.

Residents should also consider weather alerts and updates as valuable tools for developing protocols for an effective emergency response. By observing fire weather factors up to 7 days in advance, residents can update their evacuation plans before heat, smoke, flames, downed trees, and blocked roads are imminent. If the National Weather Service issues a Red Flag Warning, it means warm temperatures, very low humidity, and stronger winds are expected to combine to produce an increased risk of fire danger.

The following fire weather products are available in a user-friendly, no-cost format, allowing residents, homeowners, and land managers to easily prepare for increased fire danger:

- Interactive iNWS Mobile Alerting System: https://inws.ncep.noaa.gov/
- NWS Fire Weather Outlook: https://www.spc.noaa.gov/products/fire_wx/fwdy1.html
- NWS Zone Forecast for Owens Valley: https://forecast.weather.gov/MapClick.php?zoneid=CAZ520
- 7-Day Fire Wildfire Potential (California)
    - Map: https://fsapps.nwcg.gov/psp/npsg/forecast#/outlooks?state=map&gaccId=8
    - PDF: https://gacc.nifc.gov/oscc/predictive/outlooks/Scal_Fire_Potential.pdf

Please see Appendix B for a list of educational resources.

Table 4.2 lists public education recommendations to be implemented in the Planning Area.

RECOMMENDATIONS FOR REDUCING STRUCTURAL IGNITABILITY

Table 4.2 provides a list of community-based recommendations to reduce structural ignitability that should be implemented throughout the Planning Area. Reduction of structural ignitability depends largely on public education which provides homeowners the information they need to take responsibility for protecting their own properties. A list of action items that individual homeowners can follow can be found below. Carrying out fuels reduction treatments on public land may only be effective in reducing fire risk to some communities; if homeowners have failed 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 or damage houses that had not been impacted by direct flame impingement. Hardening the home to 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, leaves, pine needles, woody materials, and combustible 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. Combustible materials can include stacks of firewood and lawn furniture. In essence, reducing structural ignitability and creating defensible space are key for protecting from the potential loss and damage due to intense wildfires. Detailed information regarding defensible space practices as well as a list of actions for reducing structural ignitability can be found in Appendix J.

Below you will find pertinent information regarding recent legislation related to Goal 2 of the Cohesive Strategy.

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 (CA GOPR 2020a).

California Fire Code Chapter 49: This chapter of the California Fire Code is designed to reduce ember intrusion and minimize total losses to conflagrations. The chapter provides minimum standards for buildings with the aim of decreasing overall structural ignitability. Also discussed within the chapter are requirements regarding defensible space and vegetation management. For more information visit: https://up.codes/viewer/california/ca-fire-code-2022/chapter/49/requirements-for-wildland-urban-interface-fire-areas#49

California Building Code Chapter 7A: This Chapter of the California Building Code establishes requirements for structures located within the WUI. Among these minimum standards are vegetation management practices, defensible space guidelines, and use of ignition-resistant construction material, fire-resistant exterior windows, and attic vent coverings. For more information visit: https://up.codes/viewer/california/ca-building-code-2016/chapter/7A/sfm-materials-and-construction-methods-for-exterior-wildfire-exposure#7A

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Table 4.2. Recommendations for Creating Fire-Adapted Communities (Public Education and Reducing Structural Ignitability)*

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC #1		H	Winter 2023	Inform the public on how to mitigate risk and damage from wildfire	All communities	Independence FSC, Inyo County Wildfire Preparedness Coordinator, and Fort Independence	• Create wildfire information and education documents for distribution • Increase awareness and knowledge through community workshops and training classes on defensible space, fire safe landscaping, and structural hardening concepts • Provide a printed list of mitigation measures to homeowners. Utilize Ready, Set, GO! literature. Utilize list of actions broken down by cost • Provide community-specific homeowner education media, including videos (demonstration projects on private property) • Work with fire departments to create a checklist of what responders look for during triage so the public can see what responders look for • Ensure that all interactions result in follow-up engagement by collecting contact information for residents interested in action • Fort Independence Tribe to use EPA GAP funding to conduct public outreach and education • Seek opportunities to work with the Whitebark Institute for defensible space and home hardening workshops and/or community demonstrations • Engage residential and business absentee landlords in Independence (refer to FAC #5 for outreach methods)	• Reduce wildfire risk through community collaboration • Protect communities and valued resources by raising awareness of community residents and those staying in the area about actions that can prevent fires	• Review and revise strategy on an annual basis	• FEMA Building Resilient Infrastructure and Communities (BRIC) Grants • EPA Environmental Education Grants • Firewise Grants • CAL FIRE Grant Programs • CFSC Grants • USFS CWDG
FAC #2	H	Spring 2024	Assess feasibility for Firewise Community Certification for Independence	Independence	Independence FSC	• Work with Firewise USA,the California FSC, and the Inyo County Wildfire Preparedness Coordinator to begin the process of Firewise certification if community supports involvement • Evaluate community interest in Firewise Certification • Engage local, county, and state stakeholders • Conduct a cost-benefit analysis of forming a Firewise certified community	• Reduce wildfire risk through community collaboration • Facilitate access to funding and assistance • Develop a framework for action	Maintain “good standing” by reporting work completed and accomplishments on an annual basis	• Firewise Grants • CFSC Grants • USFS CWDG

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Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC #3		H	Winter 2024	Implement community events focused on vulnerable populations	All communities	Independence FSC, Fort Independence, and Inyo County Wildfire Preparedness Coordinator	• Identify volunteers • Work with the Tribe's quarry staff to solicit volunteers • Host a community-led day of yard cleanup with fire mitigation in mind to encourage large numbers within the community to carry out mitigation measures and implement defensible space • Residents to assist elderly, disabled, or vulnerable neighbors • Continue to expand translation services for future mitigation events	• Reduce wildfire risk through greater adoption of Firewise and structure hardening measures.	• Yearly, in preparation for the fire season • Conduct annual review to determine what works and what doesn't	• FEMA BRIC Grants • CAL FIRE Wildfire Prevention Grants • CFSC Grants • USFS CWDG
FAC #4		H	Winter 2024	Investigate 1) opportunities to offer financial assistance for defensible space work to seniors and low-income individuals and 2) how to use community-wide benefits to motivate individuals to create defensible space	All communities	Inyo County Wildfire Preparedness Coordinator, Independence FSC, Inyo-Mono Area Agency on Aging	• Independence FSC to work with the County to identify funding opportunities • Independence FSC to identify methods to incentivize homeowners to create defensible space • Identify grants for the FSC to hire contractors to perform defensible space work • Seek opportunities to partner with Team Rubicon (https://teamrubiconusa.org/) for free wildfire mitigation support	• Assist vulnerable populations with wildfire risk reduction • Support community defensible space efforts • Reduce fuel loading within the community	• Establish a program to determine frequency of activities	• Firewise Grants • CAL FIRE Wildfire Prevention Grants • CFSC Grants • USFS CWDG
FAC #5		H	Winter 2023	Involve second-home owners and absentee homeowners, including LADWP land lessees, in wildfire education and mitigation efforts	All communities	Inyo County Wildfire Coordinator, Independence FSC, Fort Independence	• Inyo County Wildfire Preparedness Coordinator to update Independence FSC 2021 mailing list of second homeowners using county assessor's 2022 data • Include 7 Pines cabin owners	• Encourage community-wide involvement in wildfire prevention and mitigation efforts	• Biannual	Not applicable
FAC #6		H	Fall 2024	Identify roads and shelter-in place locations and inform residents about evacuation procedures	Seven Pines	Independence FSC, Cabin Owners Association, USFS, Inyo County Wildfire Preparedness Coordinator, Inyo County Health & Human Services	• Collaborate with USFS to discuss and develop evacuation procedures • Identify shelter-in place locations and locate them on a map and distribute to all resident and Include information regarding County designated community shelters. • Distribute evacuation materials using resources from CAL FIRE, Firewise, and Ready, Set, GO! • Increase awareness through community workshops and mock evacuation drills • Discuss different evacuation scenarios during USFS-community walkthroughs • Develop a map that clearly shows all roads with potential ingress and egress points into Seven Pines and distribute to all cabin owners	• Protect life and lessen the risk of entrapment • Improve community preparedness	• Yearly updates	• Firewise Grants • CAL FIRE Wildfire Prevention Grants • CFSC Grants • USFS CWDG

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Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources

FAC #7			Winter
			Spring 2023
				Address dispersed camping issues	Independence	Independence FSC, BLM, USFS, The Mammoth Lakes Trails and Public Access Foundation, Inyo County Supervisors	• Whitebark to investigate feasibility of seeking grants to implement their education program
							• Seek sustained funding sources for “Camp Like a Pro” campaign
							• Implement and/or increase agency patrols
							  ○ Assess feasibility of staffing the Grays Meadows campground during all camping seasons
							• Upgrade campground to improve fire response vehicle access and provide or improve campsite identification signage
							• Create relatively fire-safe camping zones to reduce dispersed camping
							• Reduce the amount of access points to limit potential camp sites
							• Increase fire signage throughout
							  ○ Keep the dispersed camping sign up (in public view) regardless of season
							• Enforce LADWP’s no-camping rules on LADWP land
							• Enforce USFS’s campfire rules – campfires are only permitted in existing campfire rings
							• Work with Inyo National Forest and BLM to explore feasibility of expanding and improving campgrounds to meet demand
							• Implement region specific campfire restrictions within Inyo Forest consistent with earlier timing for dispersed camping in the southern Inyo area
								• Reduce wildfire risk due to dispersed camping
								• Protect communities and valued resources by raising awareness of campers about actions that can prevent fires
									• Establish outreach and education program to determine frequency	• USFS Community Wildfire Defense Grant
										• Federal budgets (USFS, BLM)
										• CAL FIRE Wildfire Prevention Grants

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC #8		H	Spring 2024	Improve wildfire emergency notification systems and wildfire signage (for non-evacuation events)	Independence and Seven Pines	Sheriff's Office and Inyo County OES	• Establish a reliable source (website or notification system) to relay alerts and messages quickly and consistently • Investigate the feasibility of upgrading internet capabilities for emergency notices • Inyo County to work with existing service providers to explore the feasibility of upgrading internet and communications infrastructure (e.g., cell coverage enhancements) • Use electronic signage with custom messages to notify the public about fire and weather conditions • Inyo County to continue the process of upgrading the Inyo OES website • Encourage residents to sign up for public alert notifications though: • WEA-Wireless Emergency Alert system on mobile devices (https://calalerts.org/wea.html#:~:text=WEAs%20are%20designed%20to%20get,sessions%20that%20are%20in%20progress) • Inyo County Code Red Alert and Warning System (https://public.coderedweb.com/CNE/en-US/DAD807D480BF?isMobile=true)	• Provide timely emergency alerts • Facilitate evacuation efforts	N/A	• County budget • CAL FIRE Wildfire Prevention Grants • Fire Management Assistance Grant (FMAG) • USFS CWDG
FAC #9		H	Summer 2023	Maintain defensible space	Seven Pines	Cabin Owners Association and Inyo National Forest	• Work with USFS to identify restrictions • Clear needle and oak leaf litter from the roofs and around the cabins (30-foot perimeter around cabin) • Reduce ladder fuels by clearing dry shrubs and litter from the understory, as well as removing branches in contact with structures • Keep clearance to bare soil (10 feet minimum) around propane tanks and woodpiles	• Reduce wildfire risk through greater adoption of Firewise and structure hardening measures.	• Yearly maintenance	• CFSC Grants • CAL FIRE Wildfire Prevention Grants • Good Neighbor Citizenship Grant • USFS CWDG
FAC #10		H	Fall 2023	Integrate the CWPP with Fort Independence's Wildfire Vulnerability Assessment	Independence	Independence FSC, Fort Independence Tribe, Independence Volunteer Fire Department, LADWP, CAL FIRE,	• Align wildfire mitigation projects for enhanced protection and prioritization of funding • Investigate opportunities to collaborate on cross-boundary projects • Tribal representation at monthly Independence FSC meetings; and Independence FSC to participate when appropriate at Tribal collaborative functions	• Increase multi-agency collaboration • Facilitate and expedite wildfire mitigation projects	N/A	Not applicable
FAC #11		M	Spring 2024	Implement defensible space around the outbuildings and housing quarters	Mt. Whitney Fish Hatchery	CDFW, Fort Independence Tribe, BLM, USFS, CAL FIRE, Independence Volunteer Fire Department	• Implement defensible space standards on the outbuildings surrounding the hatchery	• Reduce wildfire risk through greater adoption of Firewise and structure hardening measures	• Yearly maintenance	• Firewise Grants • CAL FIRE Wildfire Prevention Grants • CFSC Grants • USFS CWDG

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC #12		H	Spring 2024	Conduct an annual community walkthrough	Seven Pines	Independence FSC, Independence Volunteer Fire Department, CAL FIRE, USFS, Cabin Owners Association	• CAL FIRE and USFS staff to host a community walkthrough day with Cabin Owners Association to determine potential projects and needs for defensible space, fuel breaks, and fire response • USFS to provide a summary of walkthrough findings and a list of suggested mitigation actions to cabin owners	• Reduce wildfire risk through preplanning • Garner buy-in from cabin owners • Establish priorities and wildfire mitigation projects	• Yearly	Not applicable
FAC #13		M	Spring 2025	Address excess rubbish and debris on private property	Independence	Inyo County OES, Inyo County Board of Supervisors	• Investigate the feasibility of establishing a County ordinance to mandate the clearing hazardous rubbish and debris	• Decrease hazardous combustible materials from the community • Enhance community safety	N/A	Not applicable
FAC #14		M	Fall 2024	Establish a community pre-fire plan	Independence	Independence FSC, Independence Homeowners, Fort Independence, Independence Volunteer Fire Department, Inyo County Wildfire Preparedness Coordinator	• Collaboratively develop a pre-fire plan to facilitate neighbor to neighbor information sharing and emergency readiness • Make plans for pet and livestock evacuations (e.g., contacts for evacuation assistance and shelter locations) • Create a map with backup energy sources that are independent of the grid • Distribute pre-fire plans to all residents and place in Airbnb properties • Identify and develop strategy to assist frail and elderly residents that may have special medical needs and may need assistance with evacuation	• Promote community involvement • Improve community preparedness	• Yearly updates	• CAL FIRE Wildfire Prevention Grants • CFSC Grants • Firewise Grants • USFS CWDG
FAC #15		H	Summer 2023	Implement defensible space and periodic yard maintenance	Fort Independence	Fort Independence, private homeowners	• Private homeowners to implement defensible space standards and yard maintenance • Seek opportunities to partner with Team Rubicon (https://teamrubiconusa.org/) for free wildfire mitigation support	• Reduce wildfire risk through greater adoption of Firewise and structure hardening measures	• Yearly maintenance	• Firewise Grants • CAL FIRE Wildfire Prevention Grants • CFSC Grants • USFS CWDG

*See Appendix A to consult relevant regulations and past planning efforts

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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 members of the public so they can reduce dependence on fire departments is essential because these resources are often stretched thin due to limited personnel and equipment. 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 4.3 provides recommendations for improving firefighting capabilities. Many of these recommendations are general in nature to be tailored for response agencies across the Planning Area.

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Table 4.3. Recommendations for Safe and Effective Wildfire Response*

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
SEWR #1		H	Fall 2024	Acquire new firefighting apparatuses and equipment for Independence Volunteer Fire Department: • brush trucks (Type 3) • water tenders • hoses • nozzles • remote controlled drone • generator	Independence	Independence Volunteer Fire Department	• Investigate funding opportunities • Coordinate with BLM and USFS	• Protect life and property through Improved firefighting response	• Annual assessment of equipment	• GSA-Federal Excess Personal Property (GSA) • FEMA Assistance to Firefighters Grants • California Fire Foundation Grant Program • USFS CWDG
SEWR #2		H	Spring 2024	Install and/or upgrade address signage and signposts	Independence, Fort Independence, Seven Pines	Independence FSC, Fort Independence, private homeowners, Cabin Owners Association	• Independence FSC to investigate the feasibility of establishing an addressing program to offer standardized, reflective address signs to community members • Seven Pines Cabin Owners Association to work with USFS for approval of signpost installation • Explore the feasibility of obtaining Computer Aided Dispatch (CAD) and related devices	• Protect life and property through Improved firefighting response	• As needed	• CFSC Grants • Firewise Grants • CAL FIRE Wildfire Prevention Grants • USFS CWDG
SEWR #3		M	Winter 2023	Repaint, add reflectors, and clear brush around hydrants (as needed)	Independence, Fort Independence	Independence Volunteer Fire Department, County of Inyo Public Works, Independence FSC	• Independence Volunteer Fire Department to take the lead • Assess interest in a joint community, volunteer fire department and County project to address hydrant refurbishing (e.g., “adopt a hydrant” program) • Homeowners are expected to take on the responsibility of knowing the location of the nearest fire hydrant in relation to their property	• Protect life and property though improved firefighting response	• As needed	• California Fire Foundation Grant Program • USFS CWDG
SEWR #4		H	Winter 2024	Develop water sources in the campground at Upper Grays Meadows to fill trucks	Seven Pines	USFS	• Investigate the feasibility of installing two 2,500-gallon water tanks in strategic locations • Explore feasibility of installing a hydrant in Upper Grays Meadow • Cabin owners to purchase a portable water pump with sprinkler system capabilities (string of sprinklers that could cover multiple cabins) that can also be used by fire responders.	• Protect communities and valued resources • Promote firefighter safety	• As needed	• U.S. Forest Service Community Wildfire Defense Grant (USFS CWDG)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
SEWR #5		M	Spring 2025	Identify Potential Operational Delineations (POD)	Seven Pines	USFS	• Establish PODs and share information with CAL FIRE, Independence Volunteer Fire Department, and BLM to enhance fire suppression efforts • Identify staging areas on Onion Valley Road to reduce congestion of emergency vehicles in the event of a fire • Prepare a pre-attack plan to identify water resources • Once established, utilize PODs as a framing and planning tool to strategize and prioritize efforts across the region and to help formulate fire management planning and operations	• Increase multi-agency coordination • Protect communities and valued resources • Enhance firefighting response	• Yearly review	• USFS CWDG
SEWR #6		H	Spring 2024	Maintain road rights-of-way within the community	Fort Independence	Fort Independence	• Continue mowing of grass fuels and mechanical treatment of shrubs to a minimum of 5 feet from both sides of the road • Clear overhead branches that are encroaching on the right-of-way • Prioritize roads with more residences and limited roadside vegetation clearance	• Enhance evacuation efforts • Improve firefighter safety	• Yearly maintenance	• FEMA Building Resilient Infrastructure and Communities Grants • CAL FIRE Community Wildfire Prevention Grants • USFS CWDG • CFSC Grants
SEWR #7		H	Fall 2024	Increase workforce and retention of firefighting personnel	All	Independence Volunteer Fire Department and CAL FIRE,	• Investigate funding opportunities to fund salary increases (CAL FIRE) • Obtain funding to assist in the payment of training both locally and out of the area • Investigate the feasibility and the level of community support to construct a training facility for south county firefighting personnel • Utilize existing Independence Volunteer Fire Department programs at high schools to recruit junior firefighters • Explore options to establish partnerships or recruitment activities with Cerro Coso Community College	• Reduce wildfire risk through greater capacity for wildfire projects • Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI	• Assess capacity on an annual basis	• FEMA Assistance to Firefighters Grants • California Fire Foundation Grant Program • FEMA Staffing for Adequate Fire and Emergency Response • USFS CWDG
SEWR #8		M	Winter 2023	Provide sufficient clearance between power lines and trees	All communities	LADWP, Independence FSC	• Use LADWP's hotline to report hazard trees that are leaning and/or touching power lines and poles (760) 873-0251 ○ LADWP patrols will evaluate reports and determine if treatment is needed	• Reduce hazard tree encroachment • Enhance firefighter safety	• As needed	Not applicable
SEWR #9		M	Spring 2025	Expand coverage of Alert California live cameras	All communities	Alert California Core University Partners	• Investigate opportunities to install cameras where there is limited coverage	• Enhance wildfire response and readiness • Support early attack plans • Facilitate emergency notifications such as evacuation orders	• Follow existing maintenance schedule	• FEMA Building Resilient Infrastructure and Communities Grants • CAL FIRE Fire Prevention Grants • USFS CWDG

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
SEWR #10		M	Spring 2024	Maintain dirt roads and trails	All communities	CAL FIRE, BLM, Inyo County, Fort Independence, LADWP	• Maintain existing road and trail networks using mechanical treatments	• Provide access to fire personnel • Establish fuel breaks and fire containment lines	• Yearly	• U.S. Forest Service Community Wildfire Defense Grant • CAL FIRE Community Wildfire Prevention Grants • FEMA BRIC Grants
SEWR #11		H	Winter 2024	Improve water supply throughout the Fort Independence area	Fort Independence	Fort Independence, LADWP, Inyo County	• Address the low water pressure issue in the hydrant system • Investigate funding opportunities with the department of water resources for upgrading the tribal hydrant system (for a successful example, refer to the Big Pine Tribe's efforts) • Install water tanks in strategic locations as backup water sources	• Protect life and property though improved firefighting response • Improve firefighter safety	• Periodic pressure testing as needed • Track yearly progress	• FEMA BRIC Grants • USFS CWDG

SEWR #12		M	Summer 2025	Assess existing water supply for fire suppression (hydrants)	Fort Independence and Independence	Independence Volunteer Fire Department, Inyo County OES	• Conduct an assessment of the integrity of the hydrant network and its power source
							  ○ The County has generators that can be used during disasters
							  ○ The County has good relationships with LADWP and SCE for additional backup power resources
								• Protect life and property though improved firefighting response	• As needed	• FEMA BRIC Grants
										• USFS CWDG

SEWR #13		M	Fall 2024	Assess opportunities and/or the viability to build a new fire station	Independence	Independence Volunteer Fire Department	• The existing fire station was constructed in the 1960s; its size is inadequate to house newer engines and equipment which are typically larger than equipment from the 1906s • Work with the Wildfire Preparedness Coordinator to seek and funding opportunities	• Protect life and property through Improved firefighting response	• N/A	• California Fire Foundation Grant Program • USFS CWDG • Volunteer Fire Capacity (VFC) Grant
SEWR #14		H	Spring 2024	Establish a dedicated Wildfire Preparedness Coordinator position for Inyo County	Independence	Inyo County	The Wildfire Preparedness Coordinator will serve to support: • Development of annual operating plans • Coordination and cooperation between agencies, organizations, and communities • Implementation of projects identified in this CWPP • Efforts regarding public outreach, awareness, and knowledge • Volunteer fire departments and FSCs with building capacity • Acquisition of grant funding The Wildfire Preparedness Coordinator position is currently grant funded	• Enhance fire prevention and protection efforts • Protect communities and valued resources through code enforcement • Streamline wildfire mitigation efforts • Increase grant opportunities	• N/A	• County budget

*See Appendix A to consult relevant regulations and past planning efforts

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CHAPTER 5 – MONITORING AND EVALUATION

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 Independence 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—and typically requires scheduled maintenance (e.g., annual, semi-annual, etc.). 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, Tribal governments 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 toward wildfire hazard and risk reduction. Web app would include attribute tables that outline project details	County	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 are 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]) plots. This method is ideal for foresters or university researchers tracking vegetation changes in forested land.

IMPLEMENTATION

The Independence CWPP makes recommendations for prioritized fuels reduction projects, measures to reduce structural ignitability, and methods for public education and outreach. Implementation 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 Independence CWPP will require the use of the action plan (recommendation matrices in Chapter 4) as well as an 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.

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. It is recommended that the CWPP be evaluated on an annual basis, which should be completed by convening the existing Core Team so that all entities contribute to the evaluation. The CWPP document and planning goals and objective should be updated annually, based on findings from the evaluation.

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. Multi-agency 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. Multi-agency 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 (types of treatments?)?
        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?

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. 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. It is suggested that the evaluation framework above be used annually to make plan updates, and a more formal revision be made on the fifth anniversary of signing and every 5 years thereafter.

ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
AMMs	avoidance and minimization measures
ATV	all-terrain vehicle
BAER	Burned Area Emergency Rehabilitation
BDU	San Bernardino Unit
BLM	Bureau of Land Management
BMP	best management practice
Btu/ft/sec	British thermal units per foot per second
CA FMTF	California Forest Management Task Force
CA GOPR	California Governor's Office of Planning and Research
CAL FIRE	California Department of Forestry and Fire Protection
CalVTP	California Vegetation Treatment Program
CAR	community at risk
CCICC	Central California Interagency Communications Center
CCIP	California Climate Investments Program
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CE	categorical exemption
CEQA	California Environmental Quality Act
CFPC	California Forest Pest Council
CFSC	California Fire Safe Council
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
EIR	Environmental Impact Report
EMS	Emergency Management System
EPA	U.S. Environmental Protection Agency

EQIP	Environmental Quality Incentives Program
ESRI	Environmental Systems Research Institute
FAC	fire-adapted community
FEMA	Federal Emergency Management Agency
FLAME	Federal Land Assistance, Management and Enhancement Act
FP&S	Fire Prevention and Safety
FRA	Federal Responsibility Area
FRI	fire return interval
FSC	Fire Safe Council
GAID	Geographic Area Interagency Division
GIS	geographic information system
GPS	global positioning system
HFRA	Healthy Forests Restoration Act of 2003
HIZ	home ignition zone
HMP	hazard mitigation plan
HVRA	highly valued resource or asset
ICC	International Code Council
IFTDSS	Interagency Fuel Treatment Decision Support System
ISO	Insurance Services Office
JPA	Joint Powers Agreement
LADWP	Los Angeles Department of Water and Power
LRA	Local Responsibility Area
MFI	mean fire interval
MND	mitigated negative declaration
NEPA	National Environmental Policy Act
ND	negative declaration
NFP	National Fire Plan
NFPA	National Fire Protection Association
NIFC	National Interagency Fire Center
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWCG	National Wildfire Coordinating Group
OES	Office of Emergency Services
OSCC	Southern California Geographic Coordination Center
PERI	Public Entity Risk Institute

PPE	personal protective equipment
RAWS	remote automated weather station
RFA	Rural Fire Assistance
SAF	Society of American Foresters
SAFER	Staffing for Adequate Fire and Emergency Response
SE	statutory exemption
SHPO	State Historic Preservation Office
SRA	State Responsibility Area
SWCA	SWCA Environmental Consultants
Task Force	California Forest Management Task Force
UCANR	University of California, Agriculture and Natural Resources
ULI	Urban Land Institute
USDA	U.S. Department of Agriculture
USDOI	U.S. Department of the Interior
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VAR	value at risk
VCC	Vegetation Condition Class
VDEP	Vegetation Departure
WFDSS	Wildland Fire Decision Support System
WRSC	Western Regional Strategy Committee
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 fire is one of several types of crown fire and is 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 M) (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 one acre) (New Mexico Future Farmers of America [NM FFA] 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. (CA GOPR 2020b).

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

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 Healthy Forest Restoration Act of 2003 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 including 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 (CA GOPR 2020b).

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 wildland-urban interface (WUI). Developed from the Healthy Forest Restoration Act of 2003. Addresses issues such as wildfire response, hazard mitigation, community preparedness, or 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, then it is expected to remain so. If it begins as an active crown fire in an adjacent stand, then 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 contain 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 fireline or use natural features to surround a fire and any control spot fires therefrom and reduce its 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. 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 on 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 (CA GOPR 2020b).

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: That 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 (CA GOPR 2020b).

Fire Adapted Communities: 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 spread and exhibits other related phenomena as determined by the interaction of fuels, weather, and topography (Fire Research and Management Exchange System [FRAMES] 2021).

Fire Break: Areas 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 – including both the natural and built environment – and their combustibility (CA GOPR 2020b).

Fire Hazard Severity Zones: Fire hazard severity zones 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 fire hazard severity zone (FHSZ) data for the entire state. There are three classes of fire hazard severity ratings within FHSZs: Moderate, High, and Very High (CA GOPR 2020b).

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 is intended to reduce the incidence of unwanted human-caused wildfires and the risks they pose to life, property or resources (CA GOPR 2020b).

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 (CA GOPR 2020b).

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, foliar moisture content 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 manmade change in fuel characteristics which 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” (CA GOPR 2020b).

Fuel Moisture Content: This is expressed as a 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 percent. 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 range- and forested lands, 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 2019b).

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 (CA GOPR 2020b).

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 (Interagency Fuel Treatment Decision Support System [IFTDSS] 2021).

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

Incident: An occurrence or event, either natural or person-caused, which 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 2021f).

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property and to 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 2021a).

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: A term specific to California, designating areas where the local government is responsible for wildfire protection. The Local Responsibility Area (LRA) includes incorporated cities, cultivated agricultural lands, and portions of the desert. Local responsibility area fire protection is typically provided by city fire departments, fire protection districts, counties, and by CAL FIRE under contract to local government (CA GOPR 2020b).

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 2021a).

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 2021b).

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

Mutual Aid: Assistance in firefighting or investigation by fire agencies, irrespective 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 (U.S. Department of Agriculture [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 which 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 fires (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 2021a).

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, as rate of forward spread of the fire front, or as rate of increase in 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 2021h).

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 (CA GOPR 2020b).

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 (CA GOPR 2020b).

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 in a percent. One hundred feet of rise to 100 feet of horizontal distance equals 100 percent (NWCG 202i).

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

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

Surface Fire: 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 1-3 m (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 manmade) -- such as homes, specific structures, water supply, power grids, natural and cultural resources, community infrastructure-- as well as other economic, environmental, and social values (CA GOPR 2020b).

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 (CA GOPR 2020b).

Wildfire: A “wildfire” can be generally defined as any unplanned fire in a “wildland” area or in the wildland-urban interface (WUI) (CA GOPR 2020b).

Wildfire Exposure: During fire suppression activities, an exposure is any area/property that is threatened by the initial fire, but in National Fire Incident Reporting System (NFIRS) 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 (CA GOPR 2020b).

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

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

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 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 6 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 6 wildland fuel types are (NWCG 2021j):

1. Grass
2. Shrub
3. Grass-Shrub
4. Timber Litter
5. Timber-Understory
6. 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 Community Wildfire Protection Plan, 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 Community Wildfire Protection Plan offers the opportunity to establish a localized definition and boundary for the wildland urban interface (USFS 2021b)

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APPENDIX A:

CWPP Planning Process and Background

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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, which have been followed in preparing the Independence 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 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-Hazard Assessment. Work with partners to develop a community Risk-Hazard Assessment that considers fuel hazards; risk of wildfire occurrence; homes, businesses, and essential infrastructure at risk; other values at risk (VARs); 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-Hazard 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 the private sector where applicable. 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

Codes and Ordinances

The Planning Area falls within Inyo County and therefore operates based on the Inyo County Code. Inyo County has a *Defensible space and fire hazard reduction* section under *Title 14 Building and Safety*, which designates all of the unincorporated areas as WUI and requires that properties in the WUI be "maintained in accordance with the defensible space requirements set forth in Government Code Section 51182 and Public Resources Code (PRC) Section 4291." Additional information about this requirement is provided here: https://library.qcode.us/lib/inyo_county_ca/pub/county_code/item/title_14-chapter_14_08-14_08_140

Additionally, Inyo County has two ordinances regarding "combustible waste materials" and their removal under Title 7: *7.36.040 Fire hazard—Removal—Required* and *7.36.050 Fire hazard—Removal—By city.* These ordinances require the full or partial removal of combustible materials that may pose a fire hazard. In the event of noncompliance, the County may enter the noncompliant premises and remove the combustible material and the owner shall be liable for expenses. More information about these ordinances is provided here: https://library.qcode.us/lib/inyo_county_ca/pub/county_code/item/title_7-chapter_7_36

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, fire-adapted forests. The plan is organized into four overarching goals, which break down into sub-goals and their correlated action items. The four sub-goals/strategies specific to wildfire include:

1. **Increase Fuel Breaks:** Reduce the risk of wildfire and slow fire spread within the WUI.
2. **Protect Wildfire-Prone Homes and Neighborhoods:** Expand and extend defensible space programs.
3. **Improve Utility-Related Wildfire Risk:** Ensure electrical corporations are compliant with wildfire regulations.
4. **Create Fire-Safe Roadways:** Ensure emergency evacuation routes can function as fuel breaks.

Like the 2014 national strategy, California's 2019 Strategic Plan, California's Wildfire and Forest Resilience Action Plan, and Federal Emergency Management Agency (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 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.

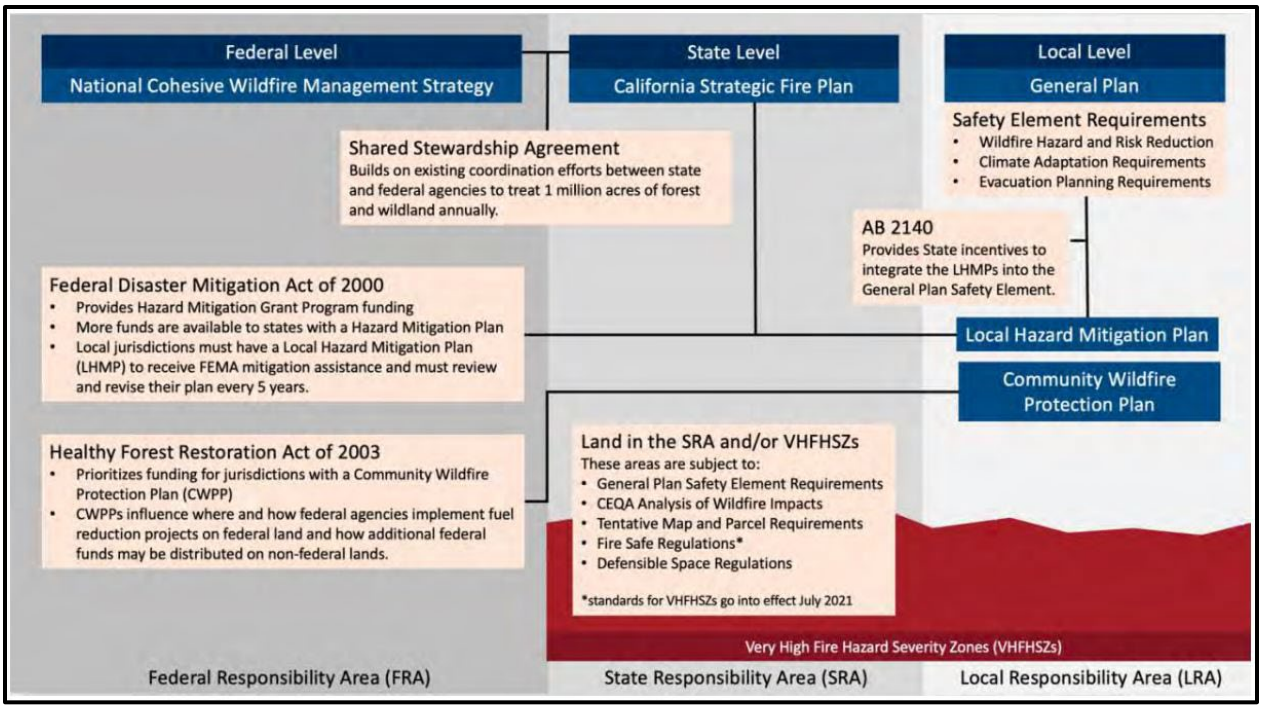

Figure A.1. California's wildfire regulatory framework. Source: CA GOPR (2022)

Assembly Bill 1823: This CWPP is in alignment with the requirement stipulated by Assembly Bill (AB) 1823 (2019). The Bill requires that on or before July 1, 2022, the State Board of Forestry and Fire Protection to 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 community wildfire protection plans (CWPPs) (CA GOPR 2020).

California Bills and Regulations

Assembly Bill 179: In September 2022, Governor Newsom signed Assembly Bill 179 authorizing $1.3 billion over the next 2 years to build wildfire resilience and bolster forest health throughout the state. The bill allocates $472 million toward forest health and fire prevention planning, $130 million toward state-owned land stewardship, $50 million for post-fire reforestation, $170 million for state conservancy forest health projects, $70 million for fire crews and prescribed burning activities, $40 million for the Regional Forest and Fire Capacity Program, $30 million for workforce development, and $25 million to assist small landowners (California Wildfire & Forest Resilience Task Force 2022). This plan is part of the governor's Wildfire and Forest Resilience Action plan, which aims to increase and expedite forest health projects to sustain and protect communities and meet economic and environmental goals (California Department of Water Resources 2021).

Assembly Bill 1823: Assembly Bill 1823 (2019) 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 (CA GOPR 2022). This CWPP is in alignment with the requirement stipulated by Assembly Bill 1823.

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, and 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 (CA GOPR 2022).

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, review and update the safety element of the general plan to include applicable climate adaptation and resilience strategies (CA GOPR 2022). This CWPP may be integrated into the safety element of the City's 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. CA GOPR recommends that climate change–related safety updates be made in alignment with ICARP vision, principals, definitions, and wildfire requirements where applicable (CA GOPR 2022).

Senate Bill 901: Senate Bill 901 (2018) requires the State Board to regularly update regulations for fuel breaks and greenbelts close to communities to enhance fire safety within the State Responsibility Area or areas designated as very high FHSZs. The Bill also requires that the updated regulations include measures to maintain undeveloped ridgelines to minimize fire risk and enhance fire protection (CA GOPR 2022).

Senate Bill 535: Senate Bill 535 (2012) outlines the initial funding requirements to communities that have been identified as "disadvantaged communities." The designation is based on pollution burden, prior designation as a disadvantaged community, and federal land status (i.e., federally recognized tribes) (California Office of Environmental Health Hazard Assessment 2023). Fort Independence has been designated as "disadvantaged" by the California Environmental Protection Agency (CalEPA) (see Figure B.5). Through its designation as a disadvantaged community, this community will receive priority for funding through the California Climate Investments Program (CCIP), including the Wildfire Prevention Grants Program, which is a part of the CCIP and is administered by CAL FIRE (State of California 2022).

PRC Section 4290: PRC Section 4290 confers the State Board with the authority to adopt regulations for base-level fire safety standards with respect to SRA land and land designated as very high FHSZ. The fire safety standards address multiple issues, including fuel modification standards for fuel breaks and greenbelts; road and driveway standards for emergency response access and public evacuation; minimum private water supply reserves for fire suppression; and standards for street, road, and building signage. However, these standards do not replace local regulations that meet or exceed minimum requirements adopted by the State Board (CA GOPR 2022).

PRC Section 4291: PRC 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 (CA GOPR 2022).

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 (CA GOPR 2022).

Senate Bill 1035: Senate Bill 1035 (2018) amended Section 65302 of the California Government Code to require local agencies to update the climate adaptation section (safety element) of the general plan at least every 8 years. This mandate would require local agencies to identify new information relating to fire hazards, climate adaptation, and resiliency measures that were not available during the last revision of the safety element (CA GOPR 2022).

Evacuation Planning Requirements: Assembly Bill 747 (2019), Assembly Bill 1409 (2020), and Senate Bill 99 (2019) were signed into law to enhance evacuation planning at the local level. Assembly Bills 747 and 1409 require local agencies to assess evacuation routes and locations under a variety of emergency scenarios, whereas Senate Bill 99 requires municipalities to identify communities with less than two evacuation routes. These planning mandates should be considered when assessing wildfire risk in the safety element of the general plan (CA GOPR 2022).

PRC 4290.5: Assembly Bill 2911 (2018) added Section 4290.5 to the PRC, which requires the State Board, in consultation with the State Fire Marshal and the local jurisdiction, to identify existing subdivisions with more than 30 dwelling units in the State Responsibility Area or areas designated as very high FHSZs without secondary egress routes, that are at high risk for fire. Following identification of subdivisions without secondary egress routes, the State Board must provide recommendations to the local government to enhance public safety in such subdivisions. This process must begin on or before July 1, 2021, and be repeated every 5 years thereafter. If available, recommendations made by the Board should feed directly into the community's general plan update (CA GOPR 2022).

PRC Section 4202: PRC Section 4202 mandates that the State Fire Marshal classify lands within the SRA into FHSZs. There are three classes of fire hazard severity ratings within FHSZs: moderate, high, and very high (CA GOPR 2022). FHSZs are used for many purposes, such as to identify areas where California's defensible space standards, WUI codes, and the State Minimum Fire Safe Regulations are mandated as well as to identify the level of hazard in a specified area or region. It's important to note that mitigation requirements apply to all zones within the SRA (CAL FIRE 2023a).

CAL FIRE 2022 FHSZ Update: In accordance with PRC 4202, CAL FIRE maintains FHSZ data for the entire state. FHSZs were originally determined and released in 2007; however, CAL FIRE recently updated these zones for the SRA in December 2022. The new FHSZs are currently in the public review process. FHSZs are defined based on vegetation, topography, and weather, and represent the probability of the area burning and potential fire behavior in the area. The new iteration of the FHSZs also accounts

for land use changes, recent fire history, new wind data, and local climate data. FSHZs for the LRA are currently in development and expected for release in summer of 2023 (CAL FIRE 2022a).

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, including state, federal, and tribal, 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 Healthy Forests Restoration Act (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 CWPPs, which facilitate 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 wind throw, 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.

In order to achieve this vision, the national strategy goals are:

1. **Restore and maintain landscapes:** Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
2. **Fire-adapted communities:** Human populations and infrastructure can withstand a wildfire without loss of life and property.
3. **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.

Disaster Preparedness Guide: The Inyo County Office of Emergency Services (Inyo County OES) has a basic Disaster Preparedness Guide available (Inyo County OES n.d.). The objective of the guide is to prepare residents for human-caused or natural disasters. The guide provides a series of preventive action steps for a range of disasters, including wildfire preparedness. The guide recommends preparing a family emergency plan and assembling an emergency kit and other supplies. It also describes shelter and sheltering-in-place options (Inyo County OES n.d.).

Inyo County General Plan: Inyo County last completed a comprehensive update of its general plan in 2001 in compliance with state law (Government Code 65300). The general plan is a comprehensive guidance document that directs future physical development throughout the county (Inyo County 2001). 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. Inyo County provides annual progress reports about updates and amendments to the plan on the planning department's section of the county website: https://www.inyocounty.us/services/planning-department/inyo-county-general-plan

Inyo County Community Wildfire Protection Plan: A CWPP was prepared for the entire county in 2009 by Anchor Point Group. This plan (Inyo County 2009) assesses the wildfire hazard throughout the county, provides some recommendations for reducing the risks, and outlines a range of fuels modification projects, including fuelbreaks for Seven Pines and along Oak Creek. The plan's assessment of risk at the community level rated Seven Pines at a "high" hazard rating and Independence at a moderate hazard rating (Inyo County 2009:B-24, B-25, B-50, and B-51). This current 2023 Independence CWPP is much more detailed with respect to its focus on a smaller geographic area.

Inyo County Multi-Jurisdictional Local Hazard Mitigation Plan: In 2017, Inyo County adopted and FEMA approved the Inyo County/City of Bishop Multi-Jurisdictional Hazard Mitigation Plan. The purpose of this plan is to assess human-caused and natural risks to communities throughout Inyo County, and to reduce the potential effects of the hazards by establishing mitigation strategies (Inyo County 2017). 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 and some generalized mitigation strategies regarding wildfire.

Inyo County has mapped the fire hazard for nearly the entirety of the Planning Area as "high." https://gis.inyoco.com/arcgis/apps/webappviewer/index.html?id=381b793851de485f89f2fef2cf9d2f15

Inyo County Emergency Operations Plan: Inyo County adopted its current Emergency Operations Plan in 2016. Regarding wildfire, this plan (Inyo County 2016) describes available resources and direction to form a federal-county Unified Command when necessary to respond to a large wildfire. An emergency operations center will coordinate resources from all jurisdictions within Inyo County.

CAL FIRE San Bernardino Unit Strategic Fire Plan: The CAL FIRE San Bernardino Unit (BDU) is comprised of San Bernardino, Inyo, and Mono counties. Inyo County is served by the Owens Valley Battalion, which operates one fire engine crew out of the Bishop Station at 2781 South Round Valley

Road and a second BDU fire engine crew out of its Independence Station at 250 East Park Street. The nearby Owens Valley Conservation Camp has five type 1 hand crews and one dozer. A program for defensible space inspections assists homeowners in complying with the requirements of Section 4291 of the California PRC. This recently updated strategic fire plan outlines a variety of fire prevention programs and projects (CAL FIRE 2022c).

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, 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 2022, the CA GOPR updated the Fire Hazard Planning Technical Advisory. The goal of the guide is to provide a framework for planners and decision-makers in addressing hazards, increasing resilience, and reducing risks associated with fire. This guide provides a brief history of fire in the state, impacts to communities, and implications of climate change as well as describes several local, state, and federal wildfire policies and regulations to inform on required planning elements and available resources. This regulatory overview sets the stage for the fire hazard planning guidance chapter, which has recommendations regarding the integration of fire hazard specific elements into general plans. This guide also contains direction to align hazard plans with broader plans and connect fire hazard planning to relevant matters such as climate adaptation (CA GOPR 2022).

Wildland Urban Interface Planning Guide: In 2022, in accordance with the requirements of Assembly Bill 75, the CA GOPR, with the Community Wildfire Planning Center and CAL FIRE, created the WUI planning guide to provide recommendations and examples to aid communities in planning for living in the WUI (CA GOPR 2022). The guide serves as a supplement to the Fire Hazard Planning Technical Advisory and discusses several plan categories, detailing their respective purpose, and how they relate to WUI planning. Some plan types referenced include, general, hazard, climate, and wildfire plans. The regulation section of the guide provides required and recommended codes for resilient WUI planning and rationale for how these measures promote a fire safe community. Additional tools and programs that enhance community resilience are detailed in the plan (CA GOPR 2022).

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 a template for fire management plans and 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 2020a).

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 treatment projects. CAL FIRE identified 35 priority projects that could be immediately implemented 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 2019a).

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 2021). 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 2021). 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 2021).

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 2021b). 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 2021b).

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/

Safer from Wildfire Initiative: This partnership program was established to increase home hardening and defensible space efforts on homes that were not built to current CAL FIRE Standards. The program was developed in a partnership with the CA OES, Planning and Research, Department of Insurance, Public Utilities Commission, and CAL FIRE to create pathways for more accessible home insurance by requiring insurers to reward safety and mitigation actions (California Department of Insurance [CDI] 2022a). The program works within the three mitigation topics of Protecting the Structure, Protecting the Surroundings, and Working as a Community to identify actionable steps to improving community resilience in a cost-effective way. Each topic has specific measures, such as upgrading to ember resistant vents, clearing under deck vegetation, or working as a community to achieve a Firewise rating (CDI 2022a). The list of actions creates consistency in home hardening. This program has been used to negotiate insurance discounts for individuals and communities based on mitigation achievements at each

level. For example, State Farm offers a discount to communities that achieve a Firewise Community rating (CDI 2022b). More information about the Safer from Wildfires initiative and currently available insurance discounts are available at the following URL: Safer from Wildfires (ca.gov)

Federal

U.S. Forest Service

The guiding document is the Land Management Plan for the Inyo National Forest (Inyo National Forest 2019). This plan satisfies the National Land Management Act of 1976 and directs all fire management activities in the forest, among other things. The "strategic fire management zones" section of chapter 3 and the fire-related actions in appendix B are perhaps the most relevant parts of the plan to this CWPP. The Inyo National Forest and BLM-Bishop Field Office collaborate through an Interagency Fire Organization.

Bureau of Land Management

The Bishop Field Office of the Bureau of Land Management (BLM) has a general fire management plan, prepared in 2004, according to a citation in a LADWP report. However, a public copy of the document is not available. In general, 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). The Bishop Field Office of the BLM last updated its Resource Management Plan in 1993. That plan contains very little about wildfire.

Tribal

The Fort Independence Tribe of Paiute Indians is currently developing a Wildfire Vulnerability Assessment for the Fort Independence area. The assessment will evaluate the vulnerability of the Tribe's lands, assets, and resources to wildfire and is expected to be completed by early spring 2023.

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 (CA 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 (CA 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

State Responsibility Area (SRA) is a legal term defining the area where the State has financial responsibility for the prevention and suppression of wildfire. Independence is within the SRA and is adjacent to the Federal Responsibility Area on the western side.

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 (CA GOPR 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. The Planning Area is currently mapped as a high FHSZ (https://egis.fire.ca.gov/FHSZ/). The mapping is being revised during 2023 (https://osfm.fire.ca.gov/media/0vphbxrc/isor-fhsz-sra-121622-to-020323.pdf), but the high rating for the Planning Area will remain (https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=fd937aba2b044c3484a642ae03c35677).

Federal Land

Inyo National Forest

The Inyo National Forest includes Seven Pines, and portions of the Forest are just west of Fort Independence and Independence. Wildfires as well as fuels management activities on these federal lands can certainly affect the Planning Area. The Land Management Plan for the Inyo National Forest (2019) is the guiding document for the forest. The USFS has created four Strategic Fire Management Zones within the forest (Inyo National Forest 2019:77–81):

- **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.

Tribal Land

Fort Independence Indian Reservation

Fort Independence is about 2 miles northwest of Independence and is situated on mostly flat topography. The Tribal lands are accessible through several roads that intersect the community, and the main thoroughfare is Highway 395. Surrounding the Tribal lands are BLM, LADWP, USFS and State lands.

Tribal lands are managed by the Fort Independence Tribe of Paiute Indians, which is a sovereign nation and a federally recognized Native American Tribe that is indigenous to the Inyo County region of eastern California. The Tribe is an active steward of the environment and one of their core pillars of focus is environmental restoration. The aim of this core pillar is to not only protect the environment but to help it thrive. Indeed, the Tribe accomplishes this objective by developing and strengthening relationships with stakeholders and the community as well as by having environmental monitoring programs (e.g., air monitoring) (Fort Independence Indian Reservation 2020). In addition, the Tribe is in the process of developing its first Wildfire Vulnerability Assessment.

STEWARDSHIP AGREEMENTS

The Inyo County Emergency Operations Plan (Inyo County 2016) describes how the county participates in local, state, and federal mutual aid systems.

In 2020, the State of California and the 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

APPENDIX B:

Community and CWPP Background Information

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LOCATION AND GEOGRAPHY

The Planning Area is roughly in the middle of the Owens Valley from north to south and roughly halfway between the Owens River channel and lower slopes of the Sierra Nevada (upper extent of the bajada of alluvial fans). Independence began to be built in the late 1860s and was originally known as “Little Pine”. Fort Independence Indian Reservation was established in 1915 with an area of about 350 acres and is about 2.5 miles north-northwest of the town of Independence. Both communities are along U.S. Highway 395. Independence is the county seat of Inyo County. Public land in and adjacent to the Planning Area is managed by the Los Angeles Department of Water and Power (LADWP), BLM, and Inyo National Forest.

Fort Independence and Independence are located on the lower portions of alluvial fans formed by Oak Creek and Independence Creek, respectively. Both communities are at an elevation of about 3,900 feet. In very general terms, the terrain on which the communities are located has a 6 percent slope from west to east toward the Owens River. The Oak Creek area is immediately upslope and upstream of Fort Independence. The eastern escarpment of the Sierra Nevada is just a few miles to the west.
The geographic location of the communities is significant because a few times each year, strong downslope winds off of the Sierra Nevada create severe fire-weather conditions. As a result of this topography and regional weather patterns, the communities are particularly at risk of wind-driven wildfires approaching from the west, as well as ignitions within the community during windy weather.

Independence, Fort Independence, and the Oak Creek area are surrounded by a sagebrush scrub plant community largely composed of big sagebrush (*Artemisia tridentata*), antelope bitterbrush (*Purshia tridentata*), rubber rabbitbrush (*Ericameria nauseosus*), and a wide variety of understory forbs and grasses (Howald 2000). Vegetation density (and therefore fuel continuity) is relatively sparse because of the arid climate (about 4–8 inches of precipitation annually on average). However, wind-driven embers can readily propagate fire through the scrubland. Although the region’s arid climate limits the density of native vegetation, irrigation in Independence and Fort Independence has created “oasis” conditions and high fuel loads within the communities compared to their immediate surroundings. Irrigated agricultural fields are adjacent to both communities to the east and north (Independence only). Observed from the air or the Sierra Nevada, the green communities and fields stand out in marked contrast to the adjacent brown sparsely vegetated landscape. The luxuriant riparian corridors of Oak and Independence Creeks are also readily apparent from above. Although the creeks and associated vegetation provide critical aquatic and riparian habitat within an arid region, the dense and continuous vegetation carries a wildfire risk analogous to a wick through an otherwise low-fuel environment (Switzer and Umek 2022).

Seven Pines is a small tract of cabins on Inyo National Forest land. Seven Pines is located along Independence Creek at about 6,200 feet elevation and about 6 miles west of Independence. A pair of Forest Service campgrounds (Upper and Lower Grays Meadow) are immediately downslope of Seven Pines. As these names imply, the area is relatively well-watered resulting from its riparian position and supports a robust stand of Jeffrey Pine.

Land ownership is varied within and around the Planning Area, and the main land-owning entities are LADWP, BLM, Tribal, California Department of Fish and Wildlife (CDFW), U.S. Forest Service (USFS), and private landowners (Table B.1). It should be noted that ownership of the Mt. Whitney Fish Hatchery is currently in the process of being transferred to the Fort Independence Tribe.

Table B.1. Breakdown of Land Ownership by Community

Community	Land Ownership	Acres	% of Community
East Independence (544 Acres)	LADWP	379	69.7
	Private	165	30.3
West Independence (326 Acres)	LADWP	177	54.3
	Private	133	40.7
	BLM	16	5.0
Fort Independence (397 Acres)	Fort Independence Tribe	237	59.6
	LADWP	141	35.6
	Private	19	4.8
Seven Pines (209 Acres)	USFS	197	94.3
	Private	12	5.7
Oak Creek (174 Acres)	LADWP	108	61.8
	Fort Independence Tribe	43	24.8
	BLM	12	6.8
	Private	12	6.7
Mt Whitney Fish Hatchery (169 Acres)	Private	47	27.6
	LADWP	45	26.7
	CDFW	39	23.0
	USFS	25	14.9
	BLM	13	7.8

ROADS AND TRANSPORTATION

U.S. Highway 395 serves as the principal road artery through the Planning Area and passes directly through Independence. All other roads in the area essentially provide out-and-back access from Highway 395 or connecting roads. Most of the roads within the core of Independence are relatively wide, paved, and flat. The Onion Valley Road links Seven Pines to Independence and provides paved-road access to a popular high-elevation trailhead at Onion Valley to the west. Opposite the Onion Valley Road, the Mazourka Canyon Road provides partially paved-road access into the Inyo Mountains to the east and connects to dirt roads running more-or-less perpendicular north and south in the Owens Valley. The dirt roads have signage and are promoted as Inyo County Off-Road and ATV trails.

In addition to the surfaced highways, numerous smaller roads and forest roads traverse a couple of the communities, with variable road conditions. Some steep grades and gravel road surfaces may impede ingress and egress in the event of a wildfire evacuation or emergency response. For instance, the road off the Onion Valley road that provides access to Seven Pines is narrow and relatively steep and narrows as it enters the cabins (Figure B.1). As another example, the local access roads within Oak Creek are poorly maintained, narrow, unpaved, and unmarked (Figure B.2).

Figure B.1. Example of a narrow road system with variable topography.

Figure B.2. Example of a narrow and unpaved road.

TOPOGRAPHY

Independence's communities are situated within the Owens Valley in the Eastern Sierra at about 4,000 feet. This is a dry valley that occurs between the Inyo Mountains to the east and the Sierra Nevada to the west. Due to the Sierra Nevada's rain shadow effect, the climate of Independence can be described as arid, which results in sagebrush vegetation covering much of the Valley. The topography surrounding much of the Planning Area can be described as relatively flat (Figure B.3); however, the communities that lie west of Highway 395 can be subject to gentle to moderate slopes due to fluvial features associated with aquatic features (e.g., creeks and streams) and fluvial fans emanating from the canyons exiting the Sierra Nevada. The Seven Pines community, however, is found in areas with steeper slopes and more mountainous topography (Figure B.4). Seven Pines is located along Independence Creek at about 6,200 feet elevation and about six miles west of Independence.

Figure B.3. Typical landscape in Independence, showing relatively flat topography in the valley floor, sagebrush shrubland in the foreground, and riparian vegetation along creeks in the background.

Figure B.4. Landscape surrounding Seven Pines, showing shrubland fuels, riparian vegetation, timber fuels (oaks and pines), and steep topography.

POPULATION

The American Community Survey of 2021 indicated that Independence had a population of 785 at the time of survey. There were 397 housing units, 314 of which were occupied (U.S. Census Bureau 2021). The 2021 survey also indicated that Fort Independence had a population of 148. There were 53 housing units, 49 of which were occupied (U.S Census Bureau 2021). Seven Pines is a recreational residence tract on federal land and therefore does not have permanent residents.

SOCIAL VULNERABILITY

The Federal Emergency Management Agency (FEMA) defines social vulnerability as the susceptibility of social groups to the negative impacts of natural hazards (e.g., wildfire), which include disproportionate death, injury, loss, or disruption of livelihood (FEMA 2022). A sole hazard occurrence can bring about considerably different impacts for distinct individuals, even if the magnitude of the hazard was the same for the entire community. Specific groups of individuals may be more susceptible to natural hazards because of socio-economic status, physical state, or other factors. For instance, elderly individuals may have more difficulty in quickly evacuating during wildfire emergencies, which may make them more susceptible to entrapment. In other cases, low-income individuals may be less able to harden and improve their homes to reduce structural ignitability, indicating that they can face a higher probability of their home being damaged or destroyed should a wildfire event occur.

According to the 2017 Inyo County and City of Bishop Multi-Jurisdictional Hazard Mitigation Plan (Inyo County and City of Bishop 2017), social vulnerability for wildfire hazards is roughly the same between residents within the high wildfire hazard zones of Inyo County, such as the communities within the

Planning Area, and residents in all of Inyo County. The similarity in social vulnerability between the communities located in wildfire hazard zones and all Inyo County communities is owed to the similar socioeconomic composition of both populations (Inyo County and City of Bishop 2017).

At the state level, CalEPA designates disadvantaged communities with respect to environmental pollution. The designation is based on pollution burden, prior designation as a disadvantaged community, and federal land status (i.e., federally recognized tribes) (California Office of Environmental Health Hazard Assessment 2023). CalEPA has designated Fort Independence as a “disadvantaged” community (Figure B.5). This designation makes Fort Independence a priority for funding through the CCIP, including the Wildfire Prevention Grants Program, which is a part of the CCIP and is administered by CAL FIRE (State of California 2022).

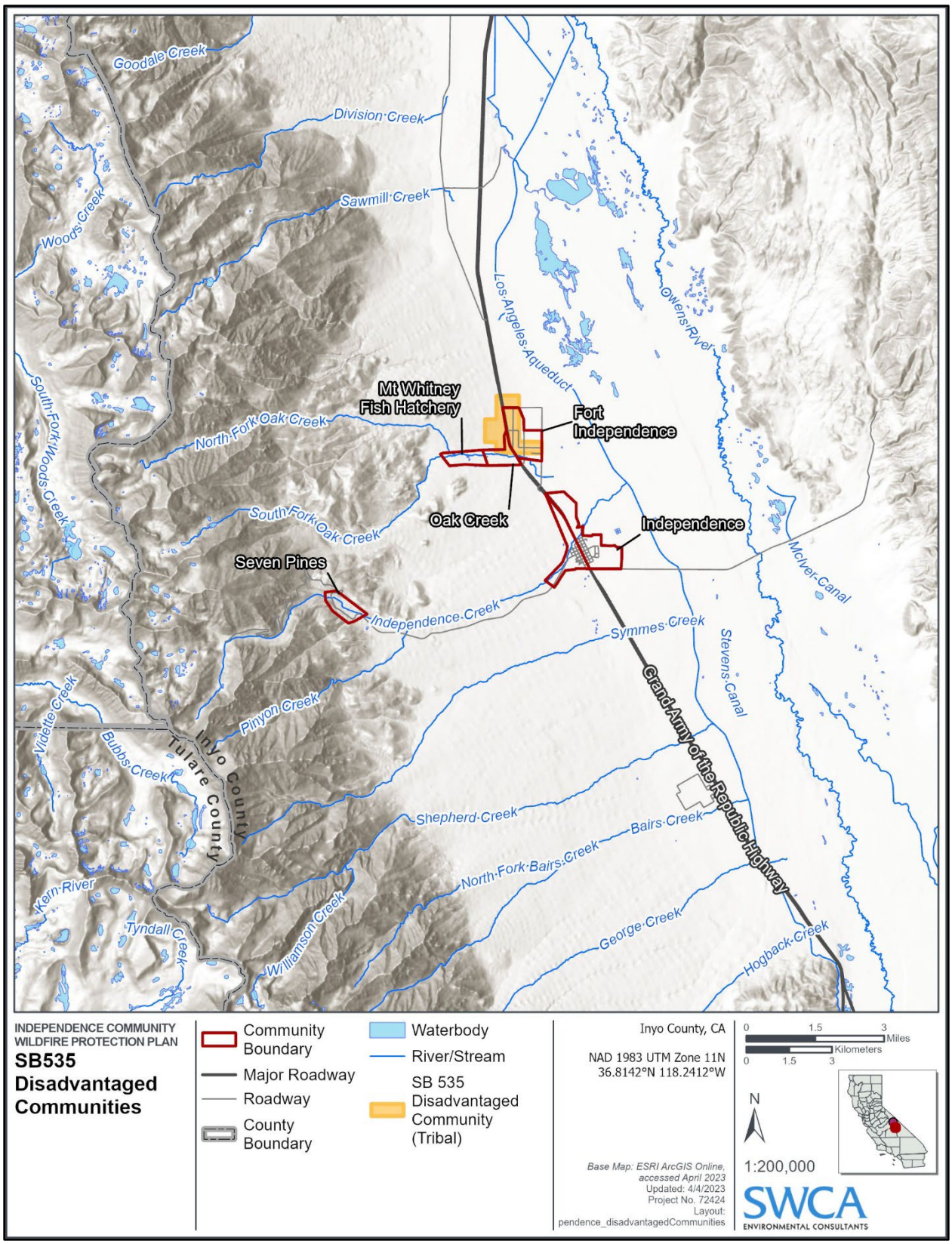

Figure B.5. Disadvantaged communities in the Planning Area as designated by CalEPA.

RECREATION

The eastern Sierra Nevada, Owens Valley, and Inyo National Forest have tremendous recreational use. Annual visitation use of the Inyo National Forest was estimated as 2.3 million people in 2016, and that number has almost certainly grown since then. The Onion Valley Road that goes west from Independence past Seven Pines and ends at a high-elevation (9,200 feet) trailhead is particularly popular. There are four public campgrounds along the road. Evacuation of this area would be problematic. A road up the North Fork of Oak Creek provides access to the Baxter Pass trailhead at 6,000 feet, but this area receives only a small fraction of the traffic to Onion Valley. This road also provides access to the historic Mt. Whitney Fish Hatchery, a little more than a mile west of U.S. Highway 395. The building and grounds are a very popular tourist destination. Dispersed camping is of significant use along the many dirt roads between the highway and the steep terrain of the Sierra Nevada. Independence Creek campground is a popular spot for camping (Figure B.6). The area where Mazourka Canyon road transitions from pavement to dirt heading east into the Inyo Mountains is used as Inyo County Off-Road and ATV trails.

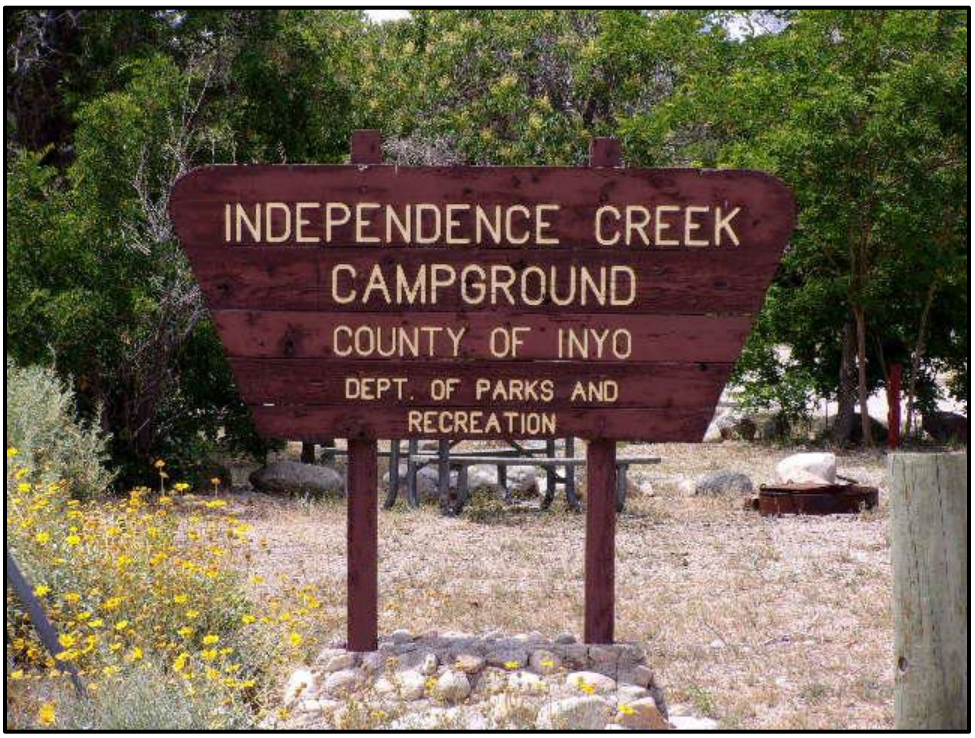

Figure B.6. Independence Creek Campground.

Source: https://www.reserveamerica.com/webphotos/originals/INYO/pid1100015/%7Bpht%7D100_0055%7Bpht%7D1495493879159.jpg

FIRE RESPONSE CAPABILITIES

LOCAL RESPONSE

Independence Volunteer Fire Department

The nearest station serving the Planning Area is the Independence Fire Station, located at 200 South Jackson Street, Independence, California 93526. Part of the Core Team witnessed the Independence Fire Department in action putting out a fire at the Commander's House on October 25, 2022, a few hours before the CWPP public meeting at the high school. The number of personnel and resources at this station can be found in Appendix D.

Other volunteer fire departments in southern Inyo County include Lone Pine Fire Protection District stations 1 and 2, 15.5 and 17.1 miles south of Independence, respectively; Big Pine Fire Department, 26 miles to the north; Keeler Volunteer Fire Department, 28 miles south and east; and Olancha-Cartago Fire Department, 39 miles to the south. These departments would be dispatched to respond to wildfires in the Planning Area as needed. If needed, Bishop Fire Department, 45 miles to the north will respond.

STATE RESPONSE

California Department of Forestry and Fire Protection (CAL FIRE)

CAL FIRE San Bernardino Unit

The nearest CAL FIRE station serving the Planning Area is the CAL FIRE Independence Station at 250 East Park Street, Independence, California 93526. The number of personnel and resources at this station can be found in Appendix D.

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 the Wildland Fire Decision Support System (WFDSS) (U.S. Geological Survey [USGS] 2021b).

Inyo 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 System lands are considered FRAs, which are regions where the federal government is responsible for fire response. On USFS land, the USFS has the responsibility for initial attack (initial response).

The Inyo National Forest and BLM-Bishop Field Office have an Interagency Fire Organization covering an area from the southern Sierra near Ridgecrest to Topaz Lake on the Nevada border, and from the crest of the Sierra Nevada to the White Mountains.

Located in Bishop, the White Mountain Ranger Station has one Type 3 wildland engine, two fire prevention patrol units, one 20-person hotshot crew (the Inyo Hotshots), a District Fire Management Officer and an Assistant District Fire Management Officer, all from the USFS. In the summer, a BLM fire prevention unit also works out of this station.

Also located in Bishop are various "Fire Overhead" personnel: fire planners, Forest Fire Management Officers, Interagency Mitigation/Education Specialist, and more. These employees are a mixture of USFS and BLM employees and manage the overall direction of the interagency fire program for the area.

At the Eastern Sierra Regional Airport is the Bishop Air Tanker Base, capable of reloading nearly all air tankers in service today, except for the Very Large Air Tankers (VLATs) such as the DC-10 and 747. The tanker base is operated on an as-needed basis, but also hosts a Single Engine Air Tanker (SEAT) during the summer.

Bureau of Land Management

Public domain lands adjacent to and near the Planning Area are administered by the Bishop Field Office of the BLM. The BLM is a member of the CA FMTF, which 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 mutual aid agreements at the federal, state, and local levels. Such automatic aid agreements allow for the 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 BDU 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.

EVACUATION RESOURCES

Evacuation planning is a joint effort among county departments, with law enforcement as the lead agency. Independence operates under the Inyo County evacuation procedures. At a county level, evacuation routes and procedures are detailed in the Emergency Operations Plan and Hazard Mitigation Plan (Inyo County 2016, 2017).

You can sign up for Inyo County emergency notifications, CodeRED, here: https://public.coderedweb.com/CNE/en-US/DAD807D480BF

People

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

- **Emergency notification methods:** Inyo County has established CodeRED, an Emergency Notification System that utilizes reverse 911. Residents must register their numbers in the system. Social networking sites such as Facebook, Nextdoor, and Twitter, as well as locally maintained blogs and email distribution lists, are other resources that have become highly valued during wildfires in nearby communities.
- **Preplanning by the public about how to evacuate and where to go:** Dead-ends, poor or missing signage, and conflicts with emergency vehicles driving into the community versus the public trying to leave complicate evacuation. 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.
- **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.

Animals and Livestock

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, during a fire and smoke situation, and transport of stock vehicles down narrow roads under stressful situations, can be very difficult. Public education could emphasize the need for individuals to have a plan for the evacuation of pets in addition to their family, ensuring a lack of planning doesn't slow or prevent evacuation.

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.

Inyo County Animal Services helps with evacuating small and large animals from fire areas. In the past, Millpond Equestrian Center and the Tri-County Fairground have offered emergency housing for evacuated animals.

WATER AVAILABILITY AND SUPPLY

The town of Independence is one of three communities (others are Laws and Lone Pine) where Inyo County Public Works Department distributes water from an allotment supplied by LADWP under terms of the Long-Term Water Agreement. The amount of the allocation was intended to encourage outdoor irrigation as mitigation for declining groundwater levels resulting from extraction via LADWP wells. This arrangement creates a situation, perhaps unique in California, in which residential water use is not under a conservation mandate and a flat fee structure seems appropriate. Inyo County now operates the water systems, which had been under contract since the County took ownership of the systems in the late 1990s. There is a great deal of deferred maintenance to be done before the Independence system can be

considered fully reliable. For example, the transmission main failed in 2017 and an aboveground plastic pipe was installed as a temporary fix. There is a fire hydrant network within Independence.

Additional water for fire suppression can be available from streams and ponds. The Fort Independence Paiute tribe is constructing a small reservoir off Oak Creek upslope of the Travel Plaza in 2023. Both Oak Creek and Independence Creek are available as water sources for pumping into engines or water tenders.

On a broader scale, 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).

VEGETATION AND LAND COVER

Vegetation zones within the community and surrounding environment are primarily a function of elevation, slope, aspect, substrate, and associated climatic regimes. Since most of the Planning Area is relatively homogenous in terms of elevation and topography, there is little change in vegetation characteristics across the area. Most of the Planning Area comprises shrub, grass, and grass-shrub communities, with pockets of dispersed trees and riparian vegetation along ditches and creeks (Figure B.7). In addition to grass-shrub communities, Seven Pines also includes mixed conifers and oaks.

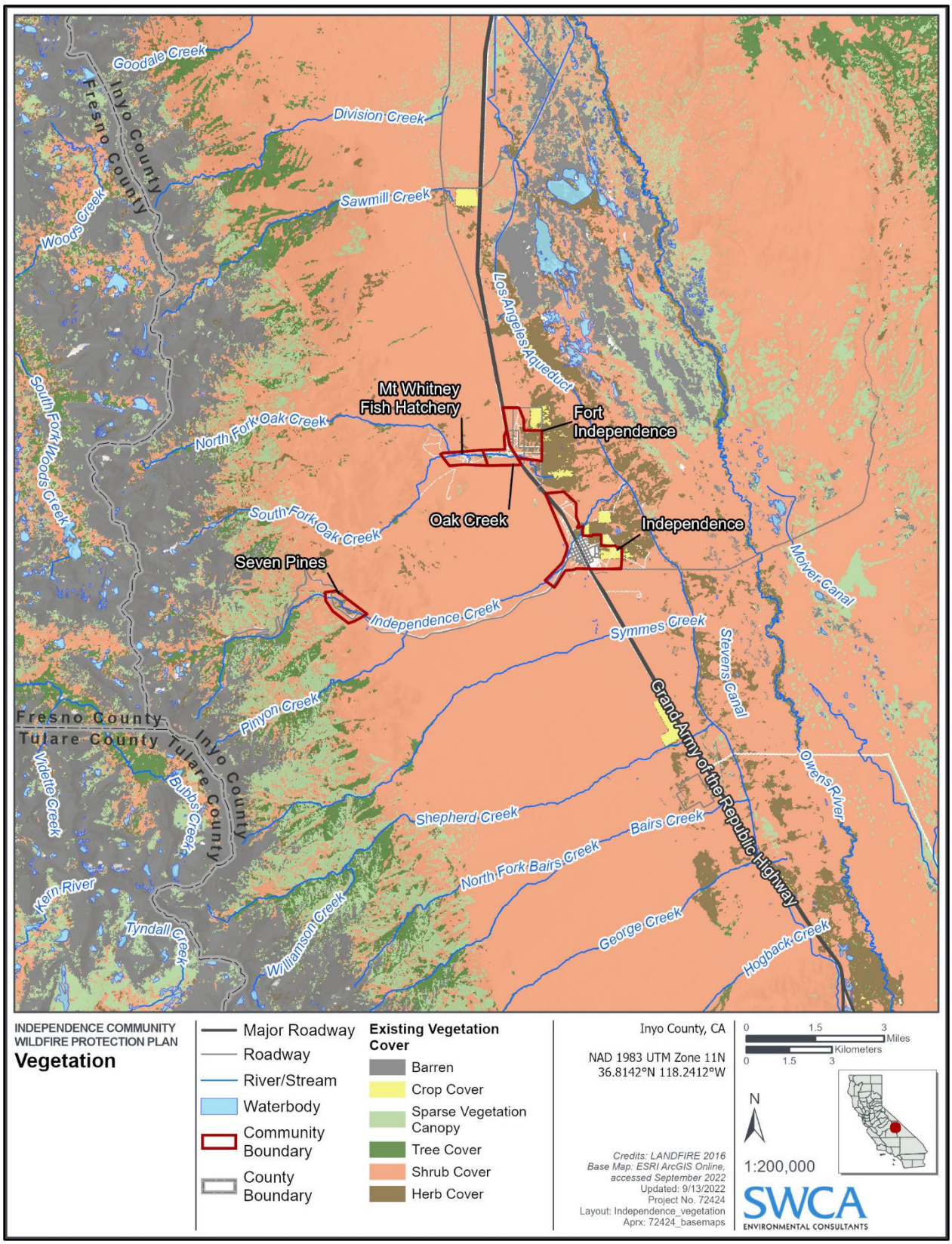

Figure B.7. Independence existing vegetation cover.

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 insects 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. Most 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 2021). 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 2021).

Insect epidemics in California forests continue to persist. In 2021, USFS's annual aerial survey showed tree mortality in 1.3 million acres out of 38 million acres that were surveyed. Tree mortality is strongly correlated with extreme and prolonged drought and subsequent bark and engraver beetle attacks (USFS 2021c). Stands of trees that have been killed by insects have varying degrees of associated impacts on fire behavior depending on the time lapse following an insect attack and structure, fuel loading, and continuity of the fuels that remain. However, forests with a large degree of mortality following an insect attack may have the potential to experience extreme fire behavior , especially if a large degree of needle cover remains in the canopy. Heavy dead fuels increase the fire suppression difficulty and snags are a significant hazard to fire crews.

Insects that have infested or have the potential to infect the forested areas in the region (e.g., Inyo National Forest) are listed below.

- **Bark beetles** (Ips Beetles) (Ips spp. and *Dendroctonus* spp.) (California Forest Pest Council [CFPC] 2021)
- **Mountain pine beetle** (*Dendroctonus ponderosae*) (CFPC 2020)
- **Jeffrey pine beetle** (*Dendroctonus jeffreyi*) (CFPC 2020)
- **Pinyon needle scale** (*Matsucoccus acalyptus*) (CPFC 2021; USFS 2021c)
- **California flatheaded borer (***Phaenops californica*) (USFS 2018b)
- **Pandora moth** (*Coloradia pandora*) (USFS 2018b)
- **Douglas-fir tussock moth** (*Orgyia pseudotsugata*) (USFS 2018b)

Diseases

Diseases of trees, such as parasitic plants, fungi, and bacteria, can also affect forests in the region (e.g., Inyo National Forest). 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 region are described below. Trees that are killed by disease have the similar potential to increase fire hazards.

- **White pine blister rust** (*Cronartium ribicola*) (USFS 2018b)
- ***Armillaria* root disease** (*Armillaria* sp.) (USFS 2018b)
- **Black stain root disease** (*Leptographium wageneri*) (USFS 2018b)
- **Heterobasidion root disease** (*Heterobasidion* sp.) (USFS 2018b)
- **Dwarf mistletoe** (*Arceuthobium campylopodum*) (USFS 2018b)

Impact of Climate Change

The rapidly 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 the state. 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 in 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, 60% of the top 20 largest wildfires in California occurred in the last 5 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 2022b). It is clear that 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 services. 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 (CA GOPR 2019).

It is 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

Extensive droughts, extreme wildfires, and post-fire debris flows have contributed to tree mortality in and around Independence, Oak Creek, Mt. Whitney Fish Hatchery, Seven Pines, and Fort Independence. Tree mortality in the vicinity of the communities occurs on public and private lands, including open spaces and creeks and ditches.

Moreover, rising temperatures, extensive droughts, extreme wildfires, and insect outbreaks have contributed to widespread tree mortality in the nearby forests, i.e., Inyo National Forest (USFS 2018b). Tree mortality due to the aforementioned factors is a natural process in forest ecosystems. However,

if due to compound disturbances or other factors, many trees die in a brief time period over large regions, forest health may be negatively affected. In addition to disrupting ecosystem functions, widespread tree mortality near developed or recreational areas present hazards as they can fall and potentially endanger the public and infrastructure (National Park Service [NPS] 2021). 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, recent droughts and rising temperatures have contributed to an increase in dead woody fuels that persist for a long period of time and present a significant wildfire hazard. As such, any increase in tree mortality results in increased fuel loading, which contributes to the potential for high severity fire and extreme fire behavior in the region (UCANR 2020).

During the 2012–2016 drought, 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 2021 annual aerial survey, the USFS detected 9.5 million dead trees statewide, mostly fir, followed by ponderosa pine, bringing the cumulative total to 173 million dead trees since 2010 (USFS 2021c). Most of the surveyed tree mortality occurred in the southern areas of the Sierra Nevada range. In Inyo County, 10,000 acres with 68,000 deceased trees were detected (USFS 2021c).

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).

WILDLIFE

Vegetation management treatments are commonly applied throughout Inyo County to benefit habitat for general wildlife species or game habitat. Most native wildlife species found in the region evolved with a frequent fire regime. However, impacts to wildlife should still be considered when planning fuel treatments.

Threatened and Endangered Species

According to the U.S. Fish and Wildlife Service's Information for Planning and Consultation Tool, several endangered or threatened species have the potential to occur within and around the Planning Area. These endangered or threatened species include three mammals (fisher [*Pekania pennanti*], North American wolverine [*Gulo gulo luscus*], and Sierra Nevada red fox [*Vulpes vulpes necator*]), three birds (southwestern willow flycatcher [*Empidonax traillii extimus*], yellow-billed cuckoo [*Coccyzus americanus*],

and California condor [*Gymnogyps californianus*]), two fishes (Owens pupfish [*Cyprinodon radiosus*] and Owens tui chub [*Gila bicolor* ssp. *snyderi*]), and two amphibians (mountain yellow-legged frog [*Rana muscosa*] and Sierra Nevada yellow-legged frog [*Rana sierrae*]) (U.S. Fish and Wildlife Service n.d.).

Although the U.S. Fish and Wildlife Service's Information for Planning and Consultation Tool suggests potential habitat for a few threatened or endangered species, the coarse-level information is not consistent with assessments by biologists familiar with the Planning Area. The riparian areas may occasionally be visited by the Southwestern Willow Flycatcher and Yellow-billed cuckoos.

Treatments on federal land would be subject to the National Environmental Policy Act (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.

PUBLIC EDUCATION AND OUTREACH PROGRAMS

LOCAL AND STATE PROGRAMS

Independence Fire Safe Council

The Independence Fire Safe Council (FSC) was established in spring 2019 by community volunteers to promote fire safety and prevention, provide education, and exchange information in the community. The Council offers various educational resources such as brochures on hardened homes and defensible space, evacuation guides, disaster readiness guides, and home evaluation guides. Each spring the FSC provides a free green waste disposal event for the community. Volunteers help clear more vulnerable properties, a roll-off dumpster for biomass material is located at the school campus, and free lunch and educational materials are available to residents.

The Independence FSC has a webpage on the Eastern Sierra Wildfire Alliance site:

- https://www.eswildfirealliance.org/independence-fsc

California Department of Forestry and Fire Protection (CAL FIRE)

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 County utilizes the Ready, Set, Go Program for their public outreach with a focus on making communities "fire adapted".

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.

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 (www.firewise.org) 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 and research. 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 National Interagency Fire Center (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

provides decision support information to be more proactive in anticipating significant fire activity and determining resource allocation needs, based on current fire danger, climate and forecasted weather. The Predictive Services group uses weather data from over 2,000 remote automated weather stations to assist in their analysis and predictions. 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 (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 assessments, public outreach, and community training. Find the toolkit here: https://www.usfa.fema.gov/wui/.

Wildfire Research Center (WiRē)

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 C:

Additional Mapping

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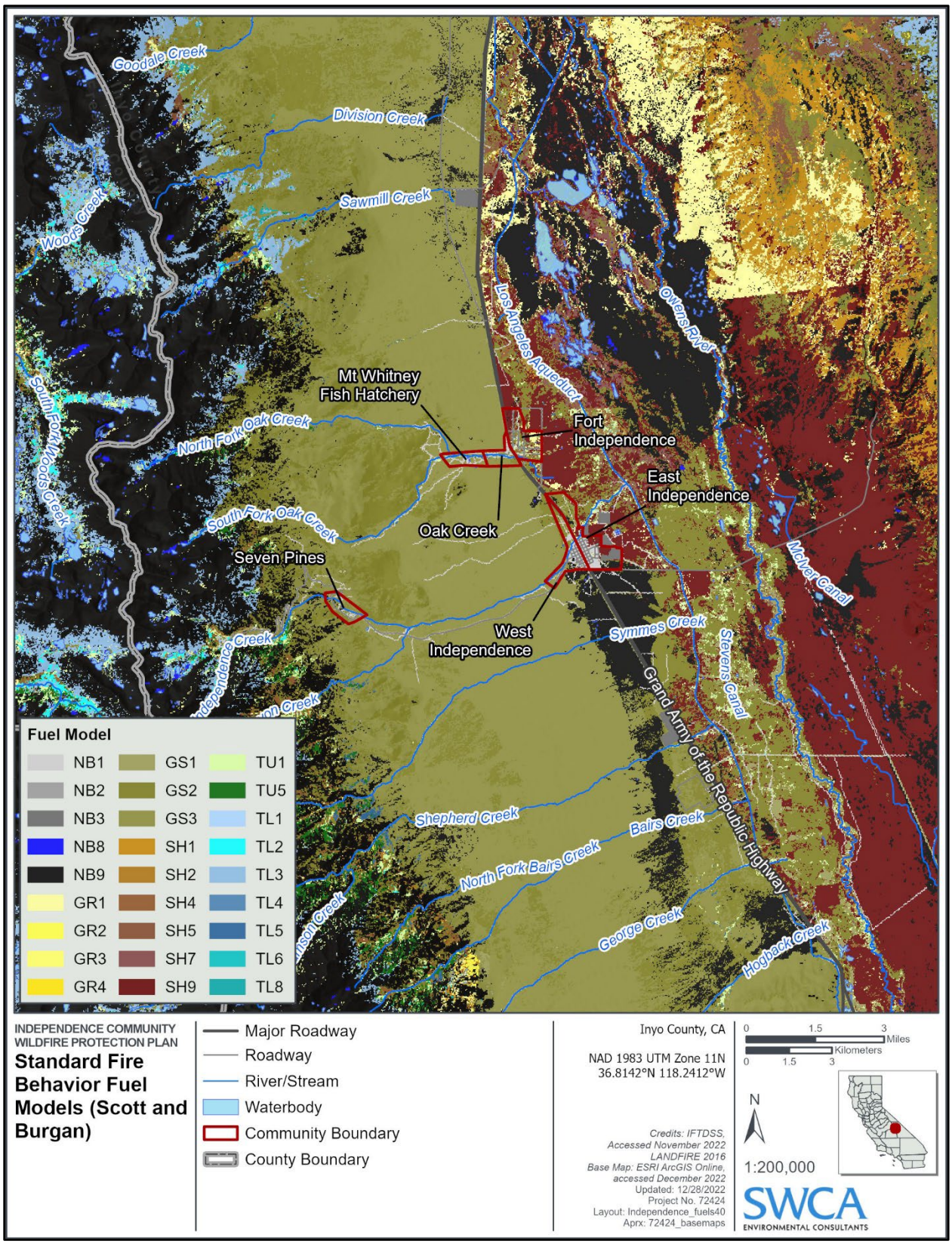
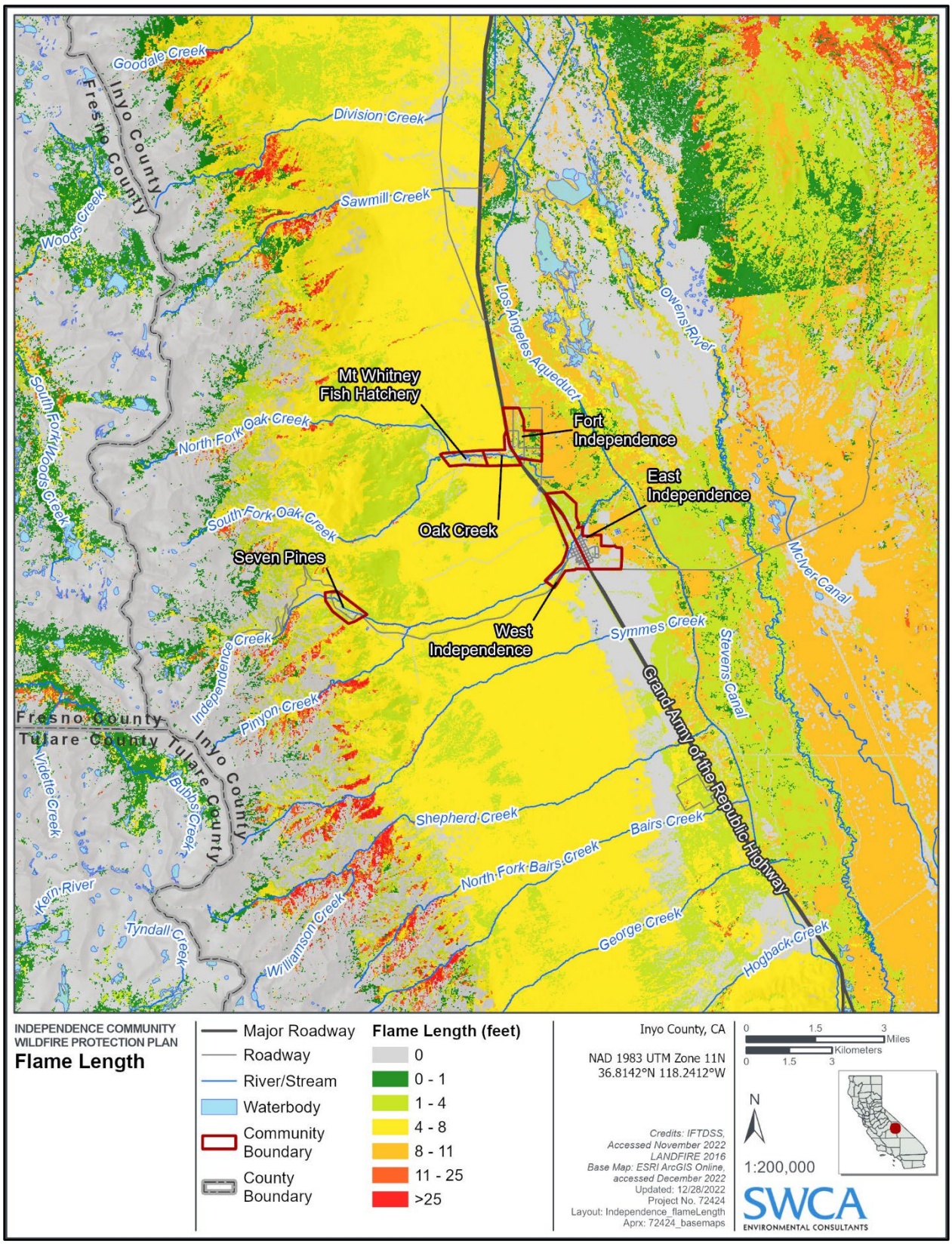
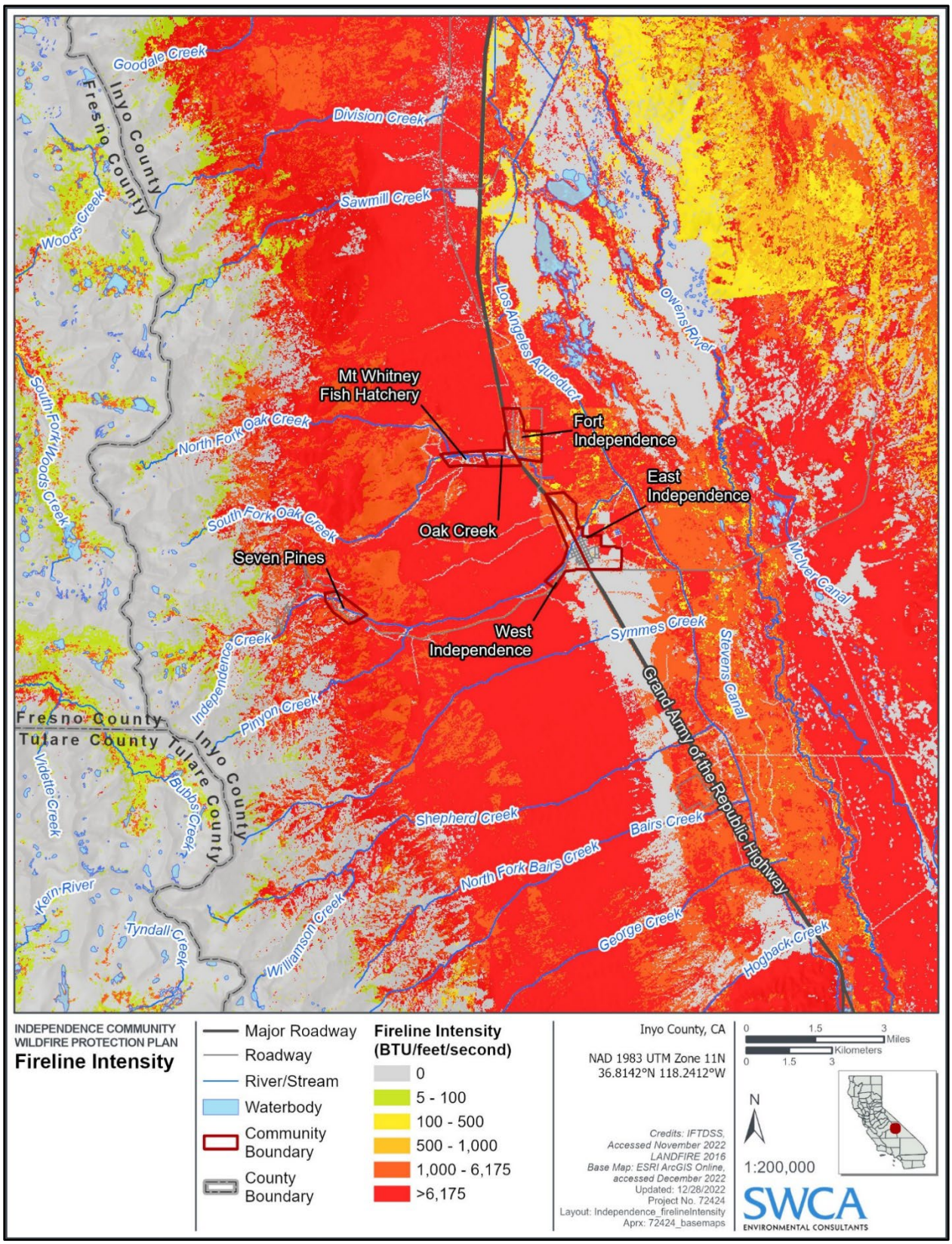


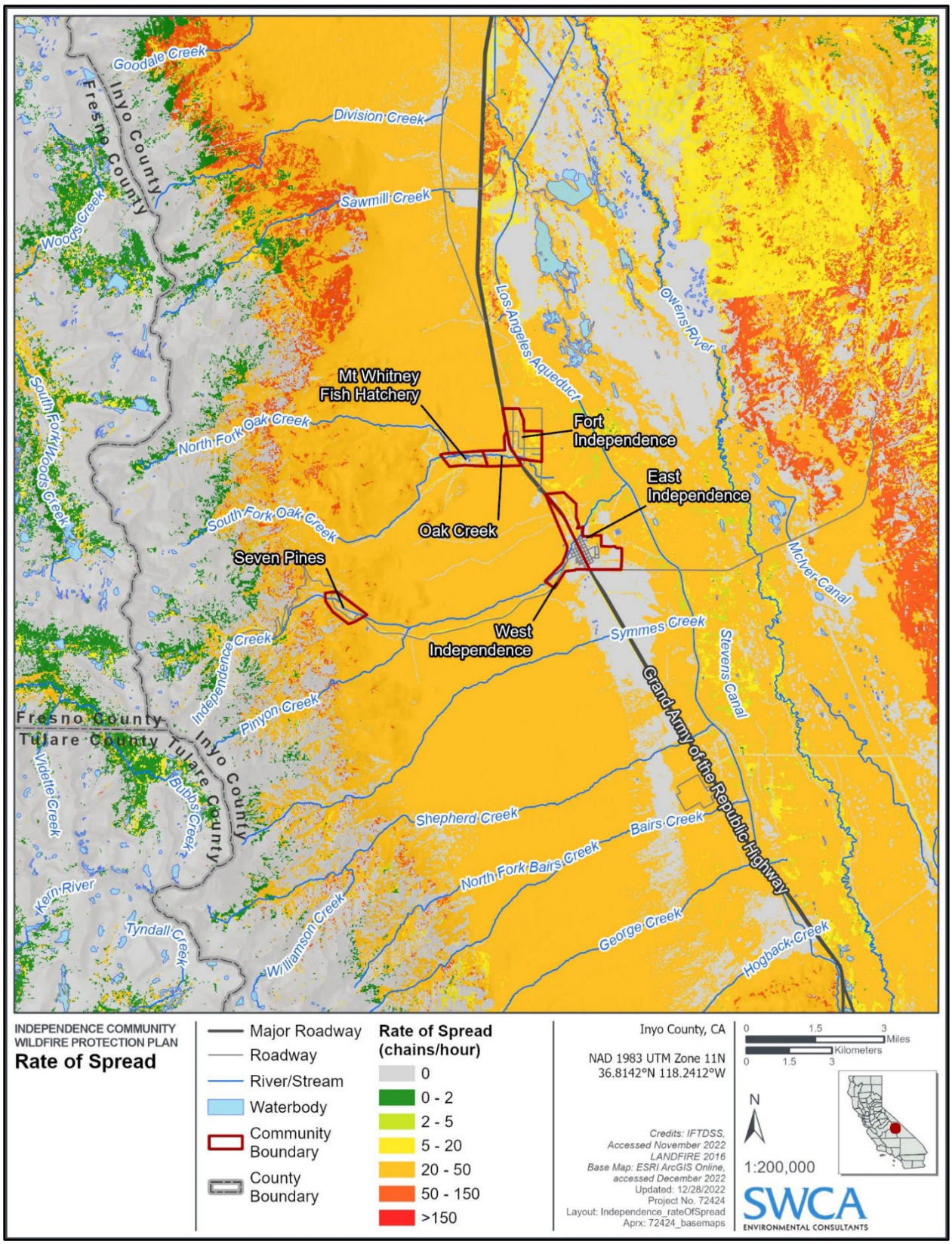
Map C.1. Scott and Burgan 40 Fire Behavior Fuel Models.



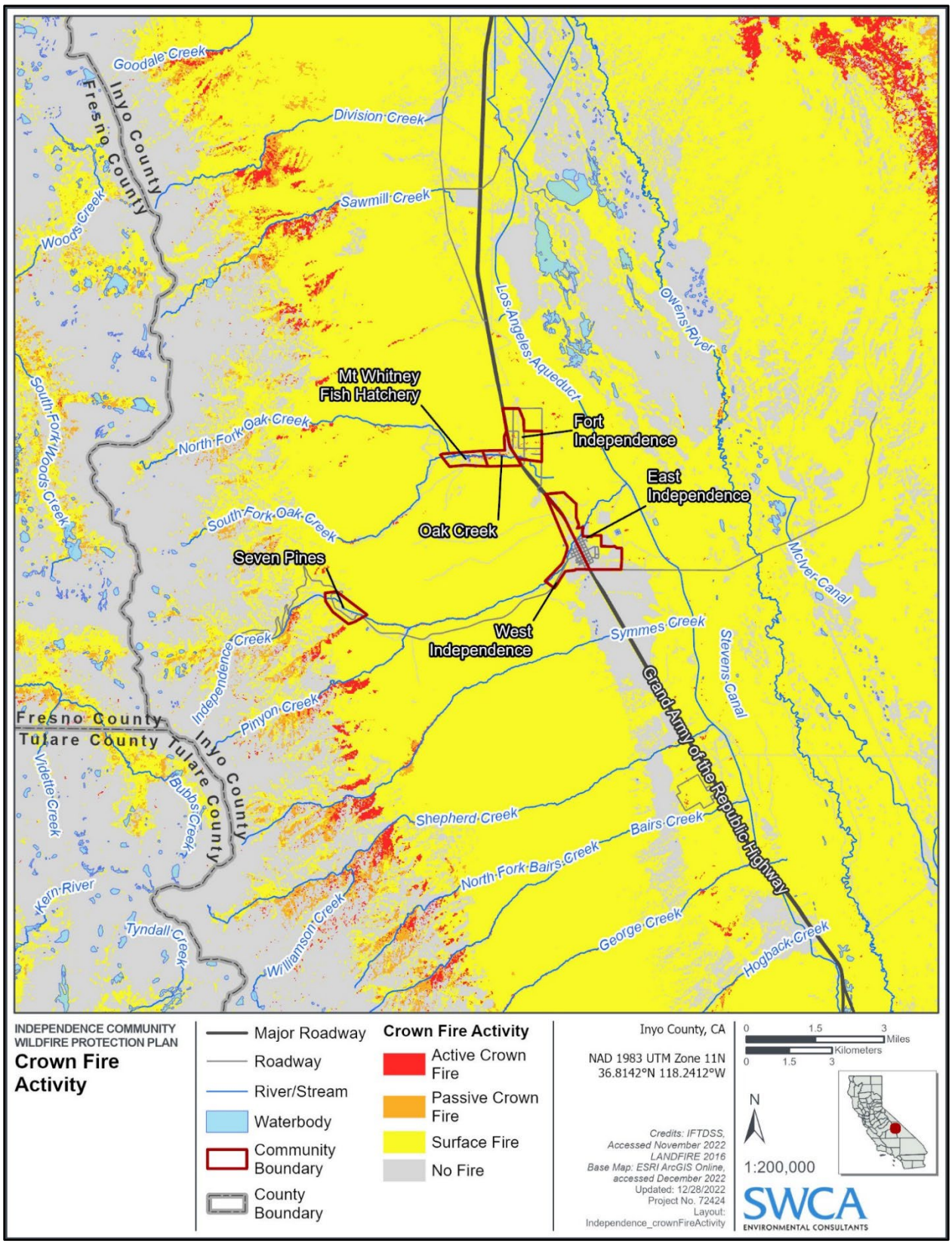
Map C.2. Risk-Hazard Assessment inputs: flame length.



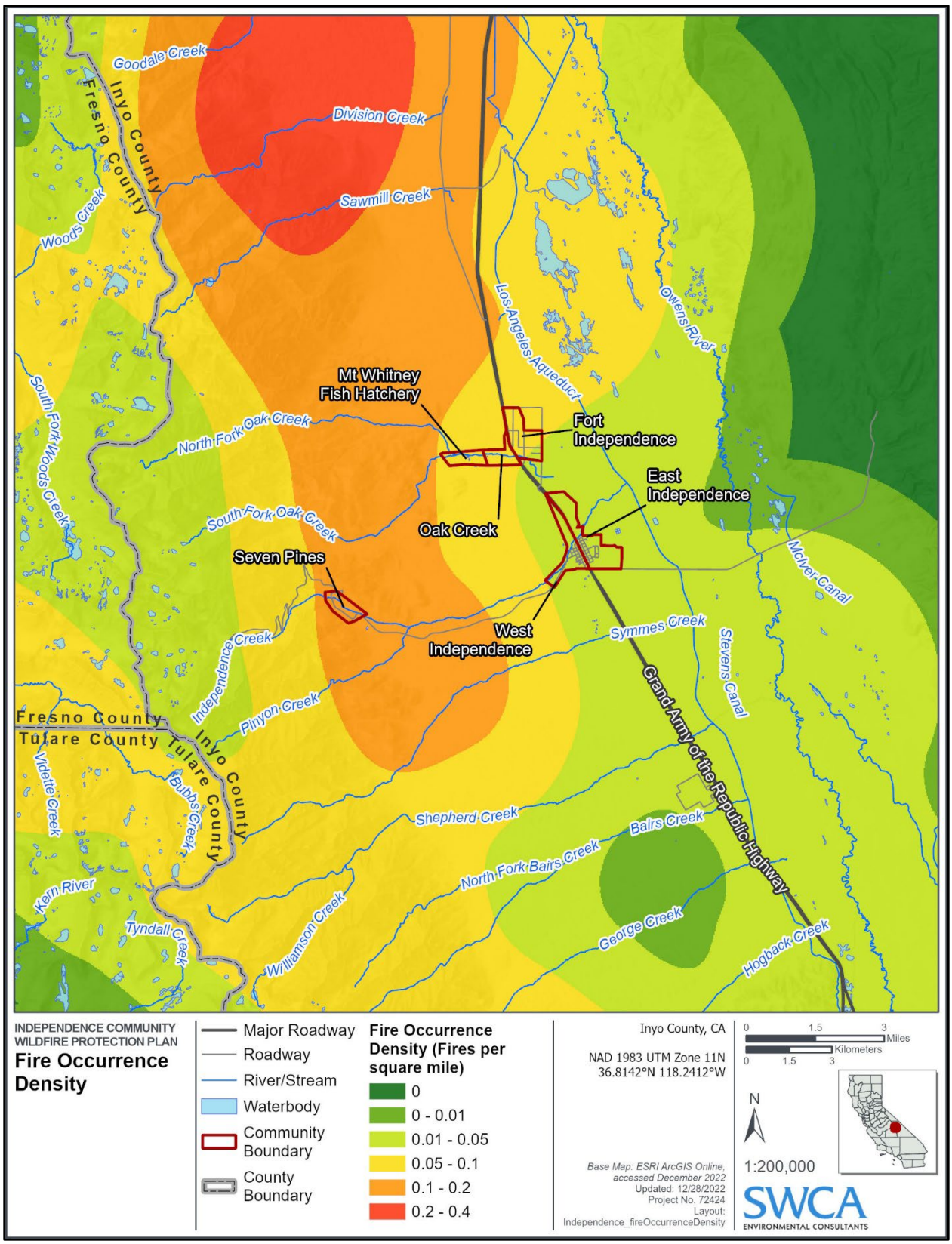
Map C.3. Risk-Hazard Assessment inputs: fireline intensity.



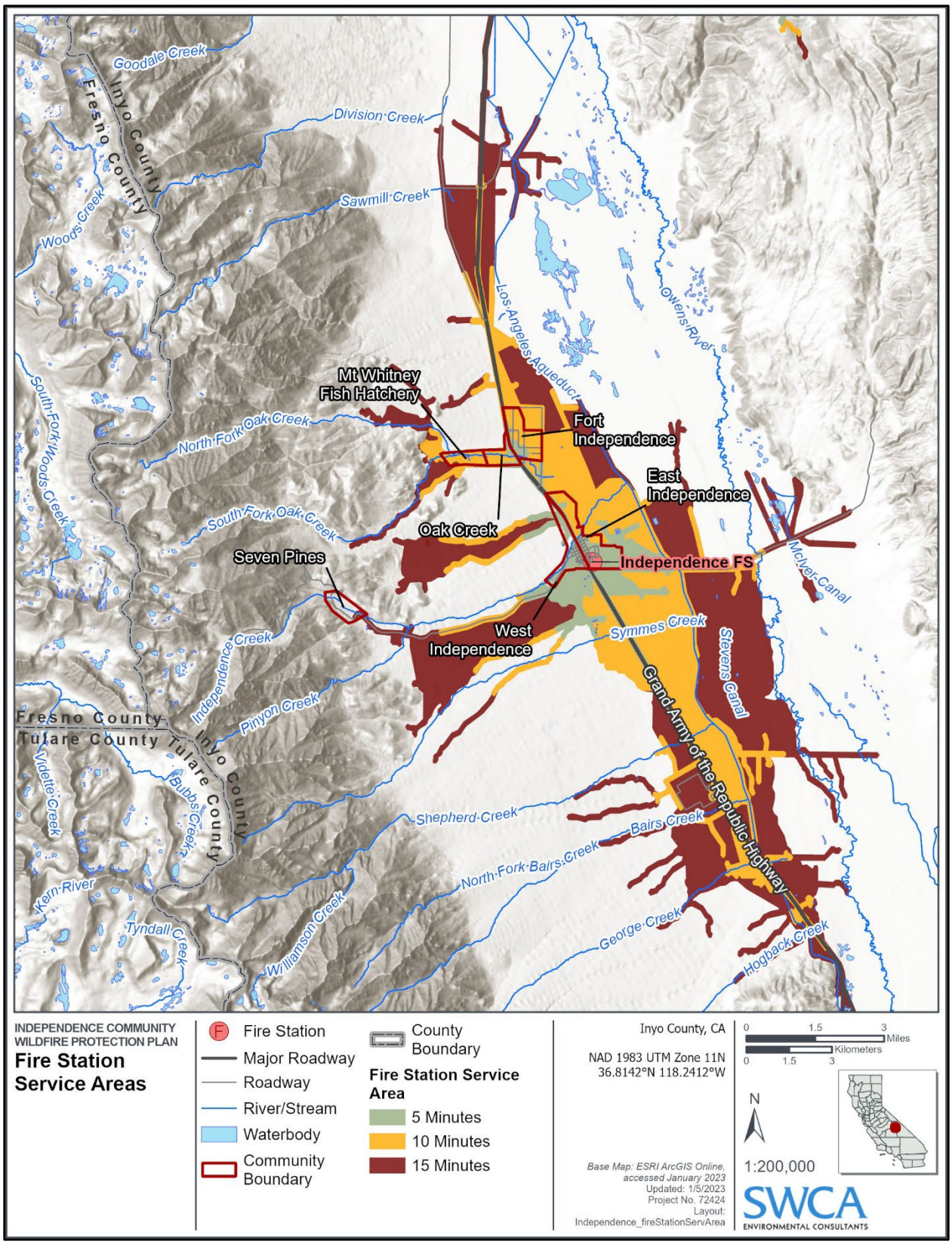
Map C.4. Risk-Hazard Assessment inputs: rate of spread.



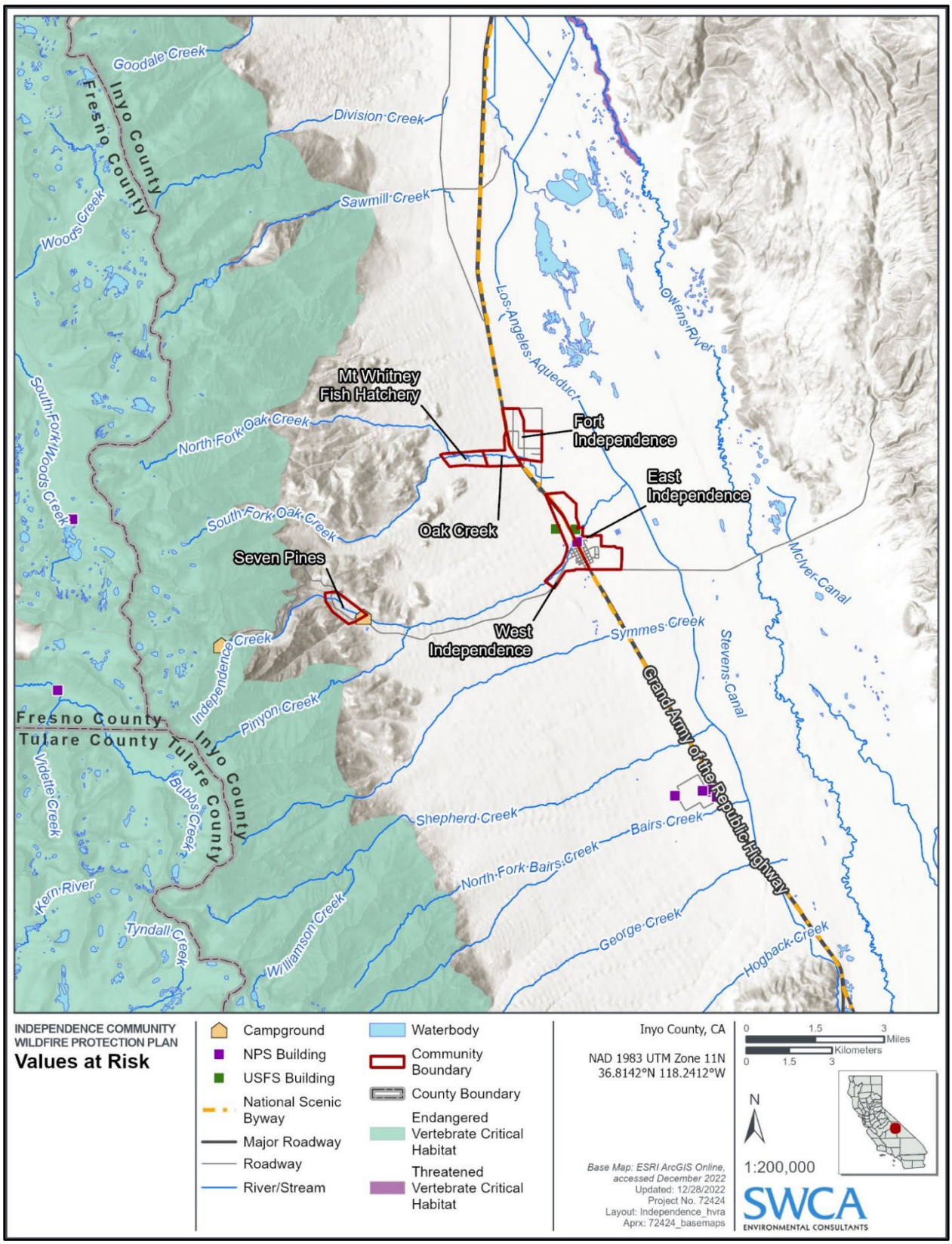
Map C.5. Risk-Hazard Assessment inputs: crown fire activity.



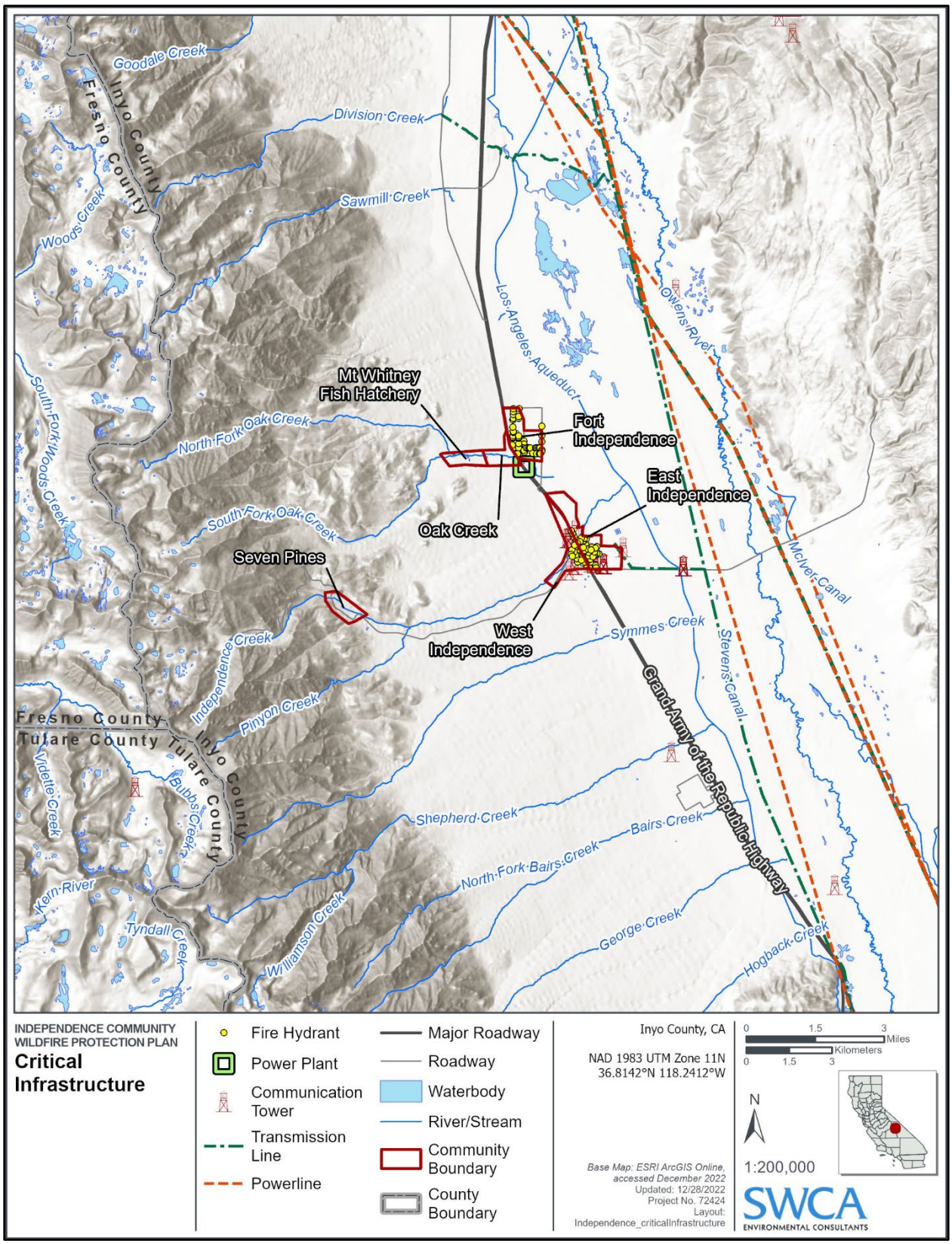
Map C.6. Risk-Hazard Assessment inputs: fire occurrence density.



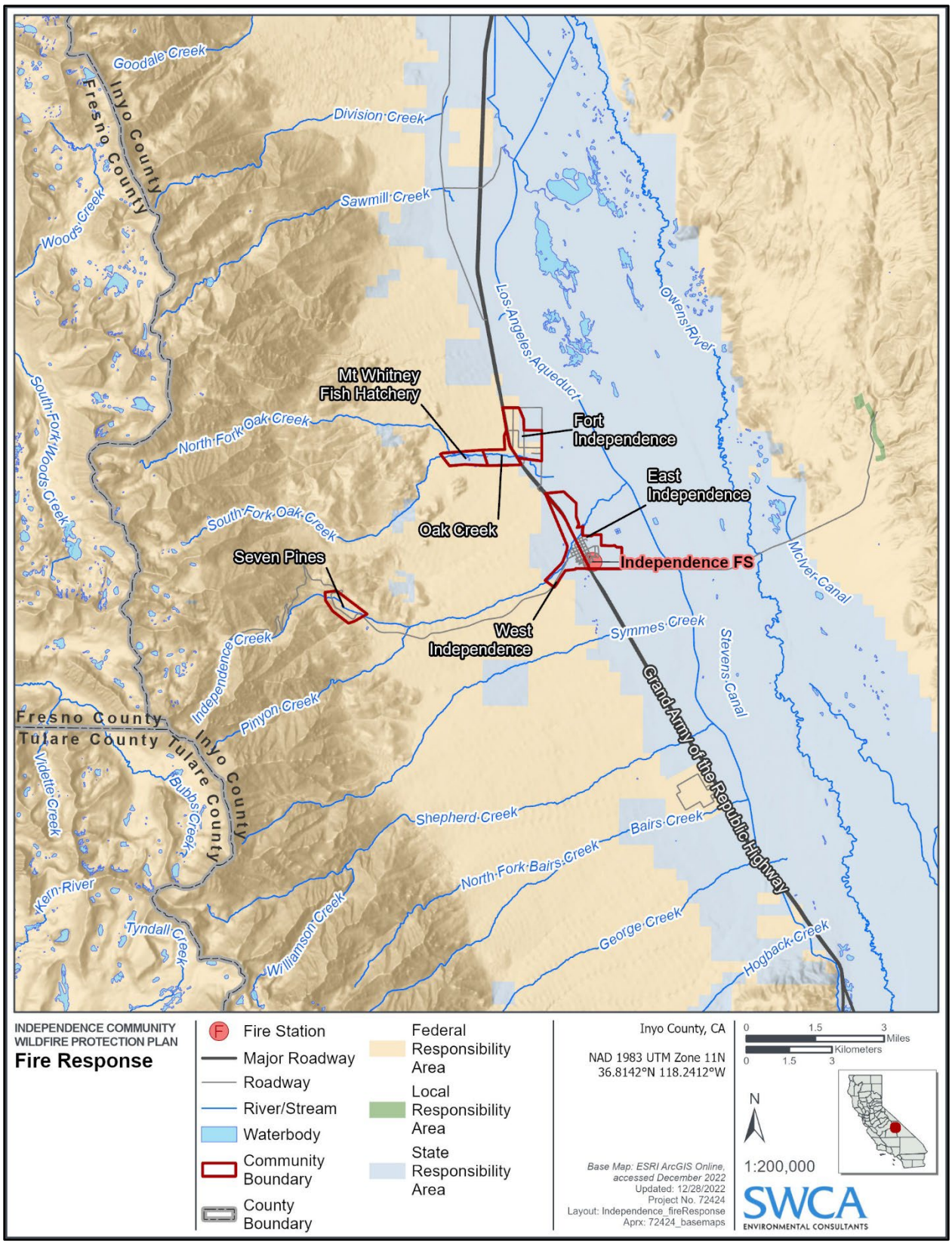
Map C.7. Risk-Hazard Assessment inputs fire station service areas.



Map C.8. Values at risk.



Map C.9. Critical infrastructure.



Map C.10. Fire responsibility areas and fire stations.

APPENDIX D:

Community Risk-Hazard Assessments for WUI Communities

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INDEPENDENCE WILDLAND URBAN INTERFACE COMMUNITIES

COMMUNITY ASSESSMENT SUMMARIES

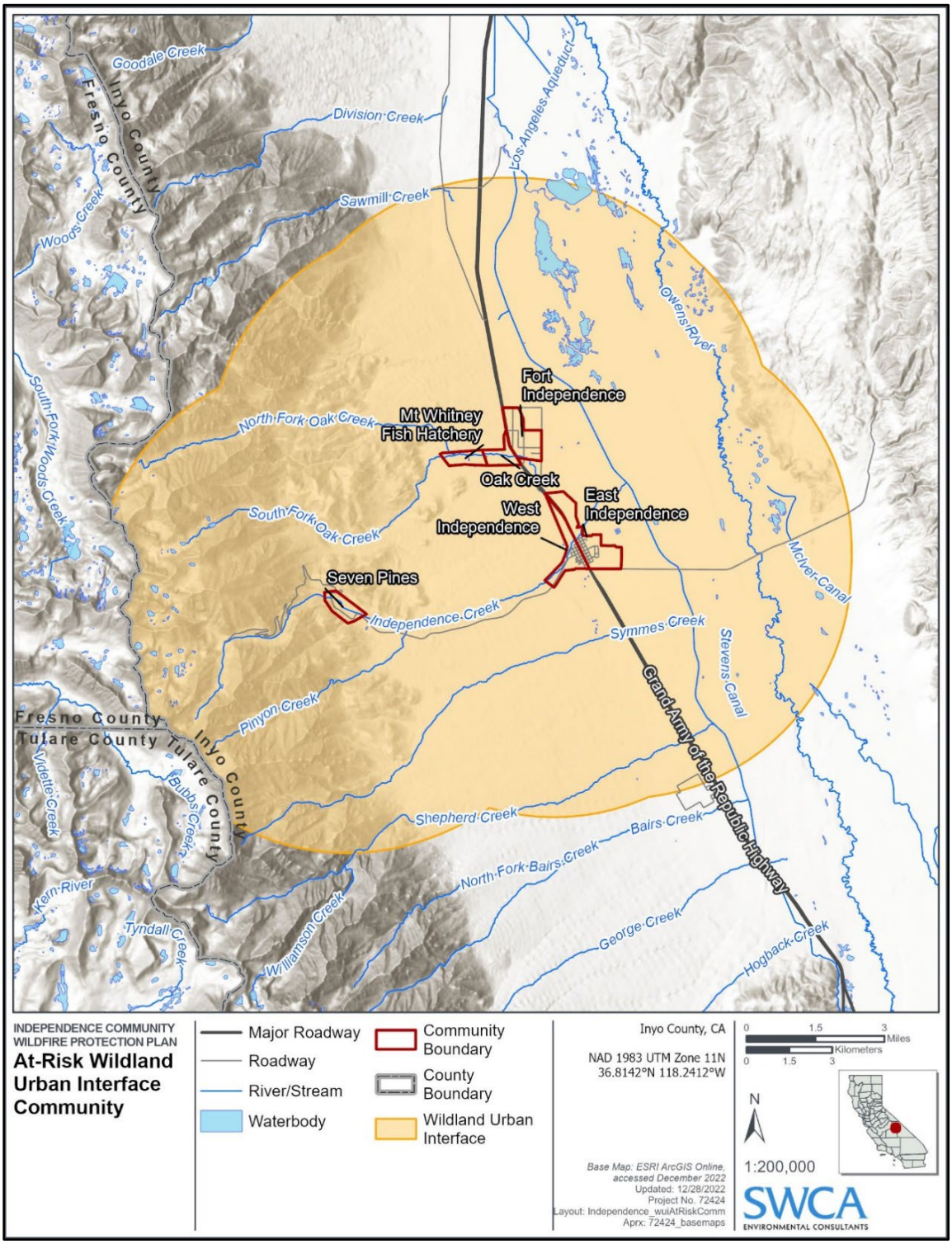

Figure D.1. Independence at-risk communities.

SEVEN PINES COMMUNITY SUMMARY STATISTICS

Community Background		
Community Name: Seven Pines	**Total Score:** 143 (Extreme)	**Land Area (acres):** 209

Percent of Community by Modeled/Calculated Wildfire Risk Inputs
Drive Time from Fire Station
0-5 (min): 0%
5-10 (min): 0%
10-15 (min): 11.7%
15+ (min): 88.3%

Fire Department Statistics:

Fire Departments: Independence Volunteer Fire Department (IVFD) and CAL FIRE BDU Independence Station

Fulltime Firefighters: 18* On-call Firefighters: -- Volunteer Firefighters: 25*

Water Tender:		Wildland Engines		
		Total Number:	4WD/AWD:	Brush Breaker:
Type 1: 1¶		Type 3: 4†	4†	--
Type 2: --		Type 4: --	--	--
Type 3: --		Type 5: --	--	--
Structure Engines:		Type 6: --	--	--
Type 1: --		Type 7: --	--	--
Type 2: 2#				
Port-A-Tanks:	2‡			
Portable Pumps:	6‡			

* IVFD contributes 25 volunteer firefighters; CAL FIRE BDU contributes 18 full-time firefighters

† Both IVFD and CAL FIRE BDU have 2 type 3 wildland engines

‡ Both IVFD and CAL FIRE BDU have 1 port-a-tank; IVFD contributes 2 portable pumps; and CAL FIRE BDU contributes 4 portable pumps

IVFD has 2 type 2 structure engines

¶ IVFD has 1 type 1 water tender

1144 Survey Summary Highlights

Positive Attributes (Low Scores)

- Street signs present
- Small, well-organized community
- Independence Creek flowing through center of community
- Recent wildfire west of community has reduced fuel loads
- Agency coordinated pre-fire planning
- Paved road leading up to community
- One large turnaround within community

Negative Attributes (High Scores)

- High fuel loads with needles in community
- Flammable shrub fuels lining access roads
- Limited defensible space
- Propane tanks exposed to flammable fuels
- Steep slopes within and surrounding community
- Non-surfaced roads with > 5% grade
- Limited turnarounds
- Non-reflective street signs
- Limited availability of water sources
- Combustible house siding
- Combustible roofing material
- One road in and out for whole community
- Community is more than 15 minutes away from nearest fire station
- Seasonal cabin use, with lack of home maintenance
- Dispersed camping to the east

Suggested Mitigation Focus Area

Areas of Concern:

- Ladder fuels within the cabin tracts and around the perimeter
- Area to the east of the cabins, where dispersed camping occurs
- Fuel loading along Independence Creek

Fire Department Concerns:

- Ingress and egress – Seven Pines Road is narrow and lined with grass-shrub fuels
- Water sources need development, e.g., installation of a water tank or hydrant
- Addressing and signposting
- Evacuation procedures

Figure D.2. Cabins are surrounded by shrubs, heavy riparian vegetation, and timber and have limited defensible space. The red boundary is the community boundary.

Source: Google Earth. Acquisition date: 07/2016.

WEST INDEPENDENCE COMMUNITY SUMMARY STATISTICS

Community Background		
Community Name: West Independence	**Total Score:** 80 (High)	**Land area (acres):** 326

Percent of Community by Modeled/Calculated Wildfire Risk Inputs
Drive Time from Fire Station
0-5 (min): 85.9%
5-10 (min): 0.1%
10-15 (min): 0.0%
15+ (min): 14.0%

Fire Department Statistics:

Fire Departments: Independence Volunteer Fire Department (IVFD) and CAL FIRE BDU Independence Station

Fulltime Firefighters: 18* On-call Firefighters: -- Volunteer Firefighters: 25*

Water Tender:		Wildland Engines		
Type 1: 1¶	Total Number:	4WD/AWD:	Brush Breaker:	
Type 2: --	Type 3: 4†	4†	--	
Type 3: --	Type 4:--	--	--	
Structure Engines:	Type 5: --	--	--	
Type 1: --	Type 6: --	--	--	
Type 2: 2#	Type 7: --	--	--	
Port-A-Tanks: 2‡				
Portable Pumps: 6‡				

* IVFD contributes 25 volunteer firefighters; CAL FIRE BDU contributes 18 full-time firefighters

† Both IVFD and CAL FIRE BDU have 2 type 3 wildland engines

‡ Both IVFD and CAL FIRE BDU have 1 port-a-tank; IVFD contributes 2 portable pumps; and CAL FIRE BDU contributes 4 portable pumps

IVFD has 2 type 2 structure engines

¶ IVFD has 1 type 1 water tender

1144 Survey Summary Highlights	
Positive Attributes (Low Scores) • 2 or more roads in and out • Flat, well surfaced roads • Accessible to fire response, ample ability to turn around (wide roads) • Reflective street signs • Onion valley road can function as a fuel break • Fuel loading surrounding town consists of light grass-shrub • Some structures with fire-resistant roofing • Ample water sources • Most of the community is within 5 minutes or less from the fire station • Structures are well spaced	Negative Attributes (High Scores) • Limited defensible space • Exposed propane tanks next to woodpiles • Fire hydrants are not easily visible • Combustible decks and fences • Potential for severe fire weather • Gas and electric lines are aboveground • Combustible siding material

Suggested Mitigation Focus Area
<u>Areas of Concern:</u> • West side of community is exposed to shrubland fuels (Onion Valley fuel break addresses the concern) • Concentration of dispersed camping to the west • Potential of Independence Creek to act as a wick drawing fire into town <u>Fire Department Concerns:</u> • Hydrants need a fresh coat of paint and a reflector • IVFD's brush trucks and water tender are older vehicles

Figure D.3. There is limited defensible space within the community, and gas/electric lines are aboveground. The red boundary is the community boundary.

Source: Google Earth. Acquisition date: 07/2016.

EAST INDEPENDENCE COMMUNITY SUMMARY STATISTICS

Community Background		
Community Name: East Independence	**Total Score:** 64 (Moderate)	**Land area (acres):** 544

Percent of Community by Modeled/Calculated Wildfire Risk Inputs
Drive Time from Fire Station
0-5 (min): 67.8%
5-10 (min): 32.2%
10-15 (min): 0.0%
15+ (min): 0.0%

Fire Department Statistics:

Fire Departments: Independence Volunteer Fire Department (IVFD) and CAL FIRE BDU Independence Station

Fulltime Firefighters: 18* On-call Firefighters: -- Volunteer Firefighters: 25*

Water Tender:		Wildland Engines		
		Total Number:	4WD/AWD:	Brush Breaker:
Type 1: 1¶		Type 3: 4†	4†	--
Type 2: --		Type 4: --	--	--
Type 3: --		Type 5: --	--	--
Structure Engines:		Type 6: --	--	--
Type 1: --		Type 7: --	--	--
Type 2: 2#				
Port-A-Tanks:	2‡			
Portable Pumps:	6‡			

* IVFD contributes 25 volunteer firefighters; CAL FIRE BDU contributes 18 full-time firefighters

† Both IVFD and CAL FIRE BDU have 2 type 3 wildland engines

‡ Both IVFD and CAL FIRE BDU have 1 port-a-tank; IVFD contributes 2 portable pumps; and CAL FIRE BDU contributes 4 portable pumps

IVFD has 2 type 2 structure engines

¶ IVFD has 1 type 1 water tender

1144 Survey Summary Highlights	
Positive Attributes (Low Scores)	Negative Attributes (High Scores)
• Reflective street signs • Easily accessible to fire response with wide roads for trucks to turn around • 2 or more roads in and out • Relatively flat, surfaced roads • Reflective street signs • Some structures with fire-resistant roofing • Ample waters sources • Most of the community is within 5-minutes or less from the fire station	• Flammable grass and shrub fuels in northeast section of community • Tree lot not maintained • Flammable shrubs surrounding community • Dead and down logs in irrigation ditches and Independence Creek • Limited defensible space • Combustible siding materials • Lack of adequate separation between adjacent structures • Severe fire weather potential • Combustible decks/fencing • Gas and electric lines are aboveground • Exposed propane tanks next to woodpiles • Fire hydrants not easily visible

Suggested Mitigation Focus Area

Areas of Concern:

- Valley View ditch has high fuel loading, particularly dead and downed trees
- LADWP tree lot and grass parcel
- Tall, dense, and continuous stands of shrubs along the perimeter of the community but particularly concentrated in the northeast section
- Dead and downed trees in Independence Creek

Fire Department Concerns:

- Hydrants need a fresh coat of paint and a reflector
- IVFD's brush trucks and water tender are older vehicles

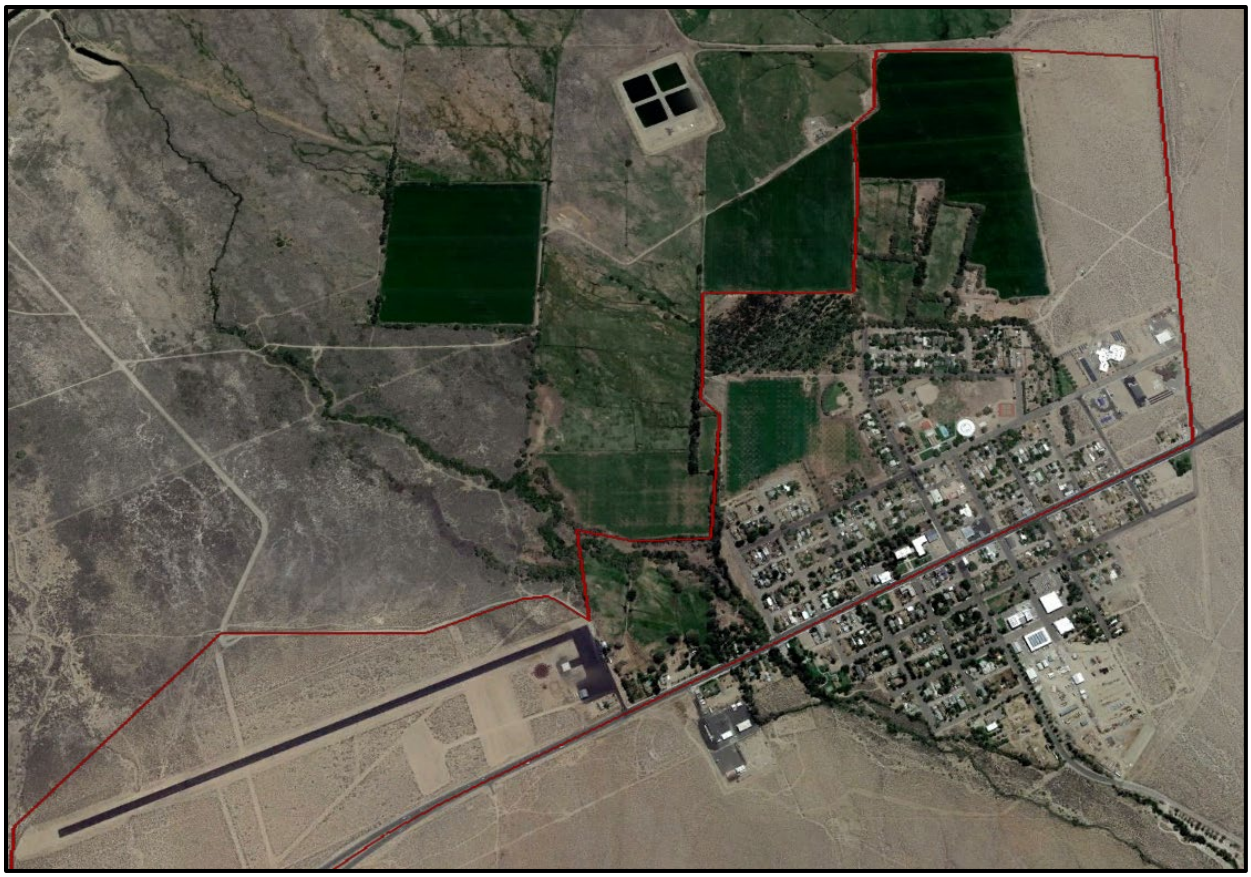

Figure D.4. Buildings are close together and surrounded by shrubs, large fields of grass and shrubs are highly flammable, and tree lots are not maintained. The red boundary is the community boundary.

Source: Google Earth. Acquisition date: 07/2016.

FORT INDEPENDENCE COMMUNITY SUMMARY STATISTICS

Community Background		
Community Name: Fort Independence	**Total Score:** 95 (High)	**Land area (acres):** 397

Percent of Community by Modeled/Calculated Wildfire Risk Inputs
Drive Time from Fire Station
0-5 (min): 25.0%
5-10 (min): 75.0%
10-15 (min): 0.0%
15+ (min): 0.0%

Fire Department Statistics:

Fire Departments: Independence Volunteer Fire Department (IVFD) and CAL FIRE BDU Independence Station

Fulltime Firefighters: 18* On-call Firefighters: -- Volunteer Firefighters: 25*

Water Tender:		Wildland Engines		
Type 1: 1¶	Total Number:	4WD/AWD:	Brush Breaker:	
Type 2: --	Type 3: 4†	4†	--	
Type 3: --	Type 4: --	--	--	
Structure Engines:	Type 5: --	--	--	
Type 1: --	Type 6: --	--	--	
Type 2: 2#	Type 7: --	--	--	
Port-A-Tanks: 2‡				
Portable Pumps: 6‡				

* IVFD contributes 25 volunteer firefighters; CAL FIRE BDU contributes 18 full-time firefighters

† Both IVFD and CAL FIRE BDU have 2 type 3 wildland engines

‡ Both IVFD and CAL FIRE BDU have 1 port-a-tank; IVFD contributes 2 portable pumps; and CAL FIRE BDU contributes 4 portable pumps

IVFD has 2 type 2 structure engines

¶ IVFD has 1 type 1 water tender

1144 Survey Summary Highlights	
Positive Attributes (Low Scores)	Negative Attributes (High Scores)
• 2 or more roads in and out • Most roads are relatively flat and surfaced • Topography of community is relatively flat • Most of the community is within 5-10 minutes from the fire station • Fuels treatment projects east of community	• Limited turnarounds • Relatively narrow roads • Some roads lined with flammable fuels • Driveway markers not always present • Some dirt roads • Heavy loading of dead/down fuels in community • Many ditches are lined with heavy fuels • Limited defensible space • Severe fire weather potential • Flammable roofing materials • Combustible siding materials • Combustible decks/fences • Poor fire hydrant visibility • Gas and electric utilities are aboveground • Exposed Propane tanks

Suggested Mitigation Focus Area

Areas of Concern:

- Ditches and creeks have high fuel loading, particularly dead and downed trees
- Thick and dense stands of shrubs within the community and along the perimeter
- Excessive dead and downed trees within private and public lands
- Roadside fuels

Fire Department Concerns:

- Hydrants need a fresh coat of paint and a reflector
- IVFD's brush trucks and water tender are older vehicles
- Low flow hydrants

Figure D.5. There are many narrow dirt roads lined with flammable fuels, and buildings have limited defensible space. The red boundary is the community boundary.

Source: Google Earth. Acquisition date: 07/2016.

MOUNT WHITNEY FISH HATCHERY COMMUNITY SUMMARY STATISTICS

Community Background		
Community Name: Mount Whitney Fish Hatchery	**Total Score:** 76 (High)	**Land area (acres):** 169

Percent of Community by Modeled/Calculated Wildfire Risk Inputs
Drive Time from Fire Station
0-5 (min): 0.0%
5-10 (min): 90.3%
10-15 (min): 4.7%
15+ (min): 5.1%

Fire Department Statistics:

Fire Departments: Independence Volunteer Fire Department (IVFD) and CAL FIRE BDU Independence Station

Fulltime Firefighters: 18* On-call Firefighters: -- Volunteer Firefighters: 25*

Water Tender:		Wildland Engines		
Type 1: 1¶	Total Number:	4WD/AWD:	Brush Breaker:	
Type 2: --	Type 3: 4†	4†	--	
Type 3: --	Type 4: --	--	--	
Structure Engines:	Type 5: --	--	--	
Type 1: --	Type 6: --	--	--	
Type 2: 2#	Type 7: --	--	--	
Port-A-Tanks: 2‡				
Portable Pumps: 6‡				

* IVFD contributes 25 volunteer firefighters; CAL FIRE BDU contributes 18 full-time firefighters

† Both IVFD and CAL FIRE BDU have 2 type 3 wildland engines

‡ Both IVFD and CAL FIRE BDU have 1 port-a-tank; IVFD contributes 2 portable pumps; and CAL FIRE BDU contributes 4 portable pumps

IVFD has 2 type 2 structure engines

¶ IVFD has 1 type 1 water tender

1144 Survey Summary Highlights	
Positive Attributes (Low Scores)	Negative Attributes (High Scores)
• Relatively flat, surfaced roads • The Hatchery has fire-resistive roofing • Reflective street signs • The Hatchery has good defensible space • The Hatchery has non-combustible siding material • Most of the community is within 5-10 minutes from the fire station	• Only 1 road in and out • Relatively narrow roads • Limited ability for fire trucks to turn around • History of fire occurrence • Severe fire weather potential • Combustible decks/fences that are less than 30 ft to a slope • Limited water sources (requires pumping from a pond) • Gas and electric utilities are aboveground

Suggested Mitigation Focus Area

Areas of Concern:

- Oak Creek has high fuel loading, particularly dead and downed trees
- Large quantities of dead and dry shrubs within the property
- Outbuildings are surrounded by dead shrubs and downed trees
- Ladder fuels to the northwest of the Hatchery: downed trees, wooden fences, and dry shrubs connect to structures

Fire Department Concerns:

- High fuel loads along the perimeter to the east, north, and west
- Large amounts of flammable debris and dead vegetation to the northwest of the historic building
- Escape routes
- Water supply

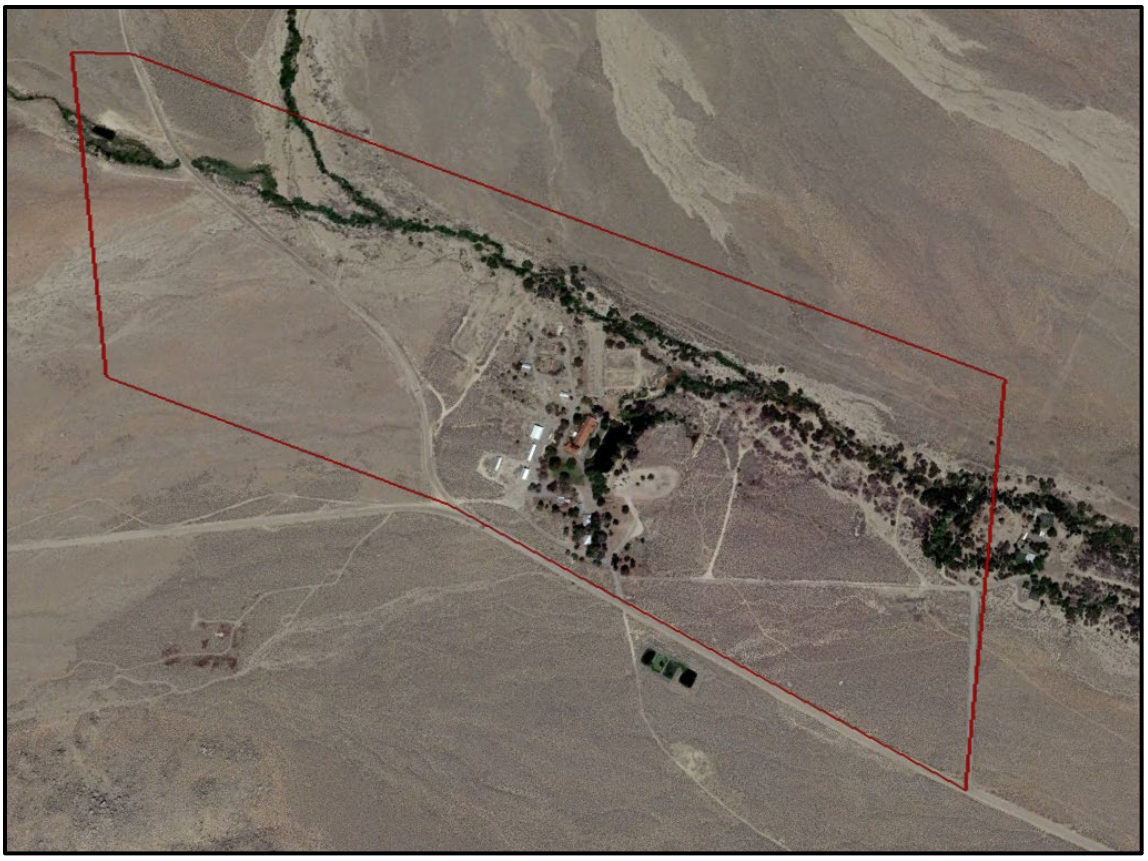

Figure D.6. There are limited roadways in and out of the community, and all are relatively narrow. The red boundary is the community boundary.

Source: Google Earth. Acquisition date: 07/2016.

OAK CREEK COMMUNITY STATISTICS

Community Background		
Community Name: Oak Creek	**Total Score:** 116 (Extreme)	**Land area (acres):** 174

Percent of Community by Modeled/Calculated Wildfire Risk Inputs
Drive Time from Fire Station
0-5 (min): 32.5%
5-10 (min): 66.1%
10-15 (min): 0.0%
15+ (min): 1.4%

Fire Department Statistics:

Fire Departments: Independence Volunteer Fire Department (IVFD) and CAL FIRE BDU Independence Station

Fulltime Firefighters: 18* On-call Firefighters: -- Volunteer Firefighters: 25*

Water Tender:		Wildland Engines		
Type 1: 1¶		Total Number:	4WD/AWD:	Brush Breaker:
Type 2: --		Type 3: 4†	4†	--
Type 3: --		Type 4: --	--	--
Structure Engines:		Type 5: --	--	--
Type 1: --		Type 6: --	--	--
Type 2: 2#		Type 7: --	--	--
Port-A-Tanks:	2‡			
Portable Pumps:	6‡			

* IVFD contributes 25 volunteer firefighters; CAL FIRE BDU contributes 18 full-time firefighters

† Both IVFD and CAL FIRE BDU have 2 type 3 wildland engines

‡ Both IVFD and CAL FIRE BDU have 1 port-a-tank; IVFD contributes 2 portable pumps; and CAL FIRE BDU contributes 4 portable pumps

IVFD has 2 type 2 structure engines

¶ IVFD has 1 type 1 water tender

1144 Survey Summary Highlights	
Positive Attributes (Low Scores)	Negative Attributes (High Scores)
• Roads are flat • Existing street signage is reflective • Oak Creek runs through community • Only 6-8 homes in community • Most of the community is within 5-10 minutes from the fire station	• Only 1 road in and out • Roads are very narrow within community • Roads are non-surfaced • Flammable vegetation along roads • No turnaround potential for fire trucks • Difficult for fire trucks to access community • No driveway markers • Limited street signage inside community • Heavy debris flows and fuel loading along banks of Oak Creek • Limited defensible space • Steep slopes in community • Limited separation of adjacent structures • Severe fire weather potential • History of recent fire occurrence • Combustible siding materials • Limited water supply. • Gas and electric utilities are aboveground • Propane tanks exposed to dry fuels

Suggested Mitigation Focus Area

Areas of Concern:

- Oak Creek has high fuel loading, particularly dead and downed trees
- Excessive dead and downed trees within the community
- Abandoned houses and structures
- Roadside fuels

Fire Department Concerns:

- Limited water sources
- Ingress and egress – unpaved, unmarked, and unmaintained roads
- Lack of safe staging locations

Figure D.7. There are limited roadways in and out of the community, and all are relatively narrow. Roadways are surrounded by flammable vegetation, and there is dense fuel loading along the creek. The red boundary is the community boundary.

Source: Google Earth. Acquisition date: 07/2016.

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APPENDIX E:

NFPA 1144 Assessment Forms

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1144 NATIONAL FIRE PROTECTION ASSOCIATION ASSESSMENT FORM

SWCA – 1144 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**

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APPENDIX F:

Funding Sources

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FUNDING SOURCES

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.

Specifically, the Community Wildfire Defense Grant Program is a $1 billion program where the Department of Agriculture will provide grants to communities at risk from wildfire to develop or revise their community wildfire protection plans and carry out projects described within those plans. It will include a mix of formula and competitive funds. Applications are expected to open early in 2023.

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 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: https://www.firstnations.org/

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: https://www.firstnations.org/rfps/california-tribal-fund-access-to-ancestral-lands-grant-opportunity/

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 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 (RCP) Grants**

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: https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/emergency-forest-restoration/index

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: https://www.fsa.usda.gov/programs-and-services/conservation-programs/emergency-conservation/index

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 farmers, ranchers and forest landowners who own or rent agricultural land to implement practices and/or install measures to protect soil, water, plant, wildlife, and other natural resources while ensuring sustainable production on their farms, ranches, and working forest lands. California EQUIP ranking pools include Catastrophic Fire Recovery and Forest Tree Mortality.

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: U.S. 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: U.S. 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: Conservation Innovation Grant (CIG) | NRCS California (usda.gov)

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 Program, National Urban and Community Forestry Challenge Cost Share Grant Program**

Agency: U.S. Forest Service

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://ordspub.epa.gov/ords/wfc/f?p=165:512:10535656593775:::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: https://www.grants.ca.gov/grants/community-development-block-grant-cdbg/
- California Clean Water State Revolving Fund Program (CWSRF): https://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/index.html

Source: **Firewise Communities**

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)**

Agency: DOI 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)**

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. SAFER grants pay for a portion of the salaries of newly hired firefighters over the 5-year program.

Source: **The Fire Prevention and Safety Grants (FP&S)**

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/firefighters/safety-awards

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. Examples of the types of projects supported by FP&S include fire-prevention and public-safety education campaigns, juvenile fire-setter interventions, media campaigns, and arson prevention and awareness programs. 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**

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:

1. Forest Health Grants: https://www.fire.ca.gov/grants/forest-health-grants/
2. California Forest Improvement Program: https://www.fire.ca.gov/grants/california-forest-improvement-program-cfip/
3. Fire Prevention Grants Program: https://www.fire.ca.gov/grants/fire-prevention-grants/
4. Urban & Community Forestry Grant Programs: https://www.fire.ca.gov/grants/urban-and-community-forestry-grant-programs/
5. Wildfire Resilience and Forestry Assistance Grant- Prop 68: https://www.fire.ca.gov/programs/resource-management/resource-protection-improvement/landowner-assistance/forest-stewardship/

Source: **California Fire Safe Council (CFSC) Grant Programs**

Agency: CFSC

Website: https://cafiresafecouncil.org/grants-and-funding/apply-for-a-grant/

Description: The CFSC 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 (CalEPA) Loans and Grants**

Agency: Multiple

Website: https://calepa.ca.gov/loansgrants/

Description: The CalEPA 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 Foundations 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.

Source: **California Fire Foundation Grant Programs**

Agency: California Fire Foundation

Website: https://www.cafirefoundation.org/programs/fireprevention/

Description: The California Fire Foundation (CFF) offers grant opportunities to fire departments, firefighter associations, and community-based organizations whose projects help address wildfire and disaster prevention, preparedness, relief, and recovery needs within the state of California. The CFF directly supports high fire threat and/or under-resourced communities.

Source: **Wildfire Recovery Fund**

Agency: California Community Foundation

Website: https://www.calfund.org/wildfirerecoveryfund/

Description: The Wildfire Recovery Fund supports intermediate and long-term recovery efforts for major California wildfires. The Fund also supports wildfire prevention and preparedness efforts. Since 2003, the fund has granted more than $32 million to support relief and recovery efforts in the aftermath of destructive wildfires.

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; 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: **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, the Matching Awards Program 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, Natural Resources Conservation Service (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: https://www.fs.usda.gov/managing-land/fire
- Insurance Services Office Mitigation Online (town fire ratings): http://www.isomitigation.com/
- National Fire Protection Association: http://www.nfpa.org
- National Interagency Fire Center, Wildland Fire Prevention/Education: https://www.nifc.gov/fire-information/fire-prevention-education-mitigation
- Department of Homeland Security U.S. Fire Administration: https://www.usfa.fema.gov/index.html

APPENDIX G:

Homeowner Resources

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ADDITIONAL LINKS AND RESOURCES

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
- How do Homes Burn in a Wildfire? https://www.youtube.com/watch?v=3QthynXympI
- Wildfire Community Preparedness Day Toolkit: https://go.nfpa.org/l/14662/2022-01-11/8j6nqh

- 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
- 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
- Outthink a Wildfire; Wildfire Action Policies: https://www.nfpa.org/wildfirepolicy

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
- 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
- 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

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APPENDIX H:

Project Outreach

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COMMUNITY OUTREACH

Table H.1 presents examples of the public outreach completed as part of the CWPP development. Online and physical resources were used to provide information to the public and solicit feedback. Community events were held by the Independence FSC, SWCA, Inyo County (Wildfire Preparedness Coordinator) and the Whitebark Institute. Figure H.1 shows the Owens Valley High School community event that was hosted to gather general community input with respect to wildfire safety. Figure H.5 shows the community open house at Owens Valley High School that was held to gather public comment on the draft CWPP. In addition, the Whitebark Institute and the Independence FSC conducted a survey of wildfire concerns and priorities. The survey and results are shown on pages H-9 through H-13.

A comprehensive and robust process was used by the Independence FSC to include a broad cross section of the community in the survey collection process. The activities occurred mostly in October 2022 and are described below.

1. On October 6, 467 surveys were mailed to post office boxes and residences.
2. Surveys were distributed during CWPP presentations at the October Civic Club meeting, October Lions Club meeting, and Independence Fire Department.
3. Ninety surveys were sent home with students from the Owens Valley High School.
4. Surveys were distributed during the Fire Prevention Week event at the Independence Volunteer Fire Department.
5. Email distributions

The Independence FSC used a similar process to encourage public participation in the Owens Valley High School community event. The activities occurred mostly in October 2022 and are described below.

1. Numerous flyers were posted around Independence and Fort Independence.
2. On October 19, 467 flyers were mailed to post office boxes and residences in Independence and Fort Independence.
3. On October 19, the flyer was distributed through email using the Civic Club emailing list.
4. Targeted emails

The Community Open House (Figure H.5) for the review of the final draft of the CWPP was scheduled in March of 2023. It was held at the Owen's Valley School Cafeteria, the same location as the previous meeting in October. To notify the public, a CWPP public announcement (flyer) was circulated through various channels. Described below are strategies for notifying the community:

1. The flyer was sent out to PO Boxes & to out-of-town homeowners announcing how to review a copy of the draft.
2. The flyer was sent via email using the Civic Club email list.
3. The flyer was be posted around town.
4. The flyer was distributed to Fort Independence residents
5. The flyer was distributed to 7 Pines cabin owners.
6. PDF copies were made available to individuals who requested one

7. Inyo County hosted the CWPP on the County website
8. IVFD received a PDF of the draft CWPP for review as soon as it was released.
9. Hard copies were made available for review at the library, museum, and fire department.
10. Three copies will be available at the Open House.

Feedback, comments, and suggestions received from community members during community events, the community survey, project recommendations review, and draft CWPP review were synthesized and utilized to craft project recommendations for the Independence CWPP. Therefore, the project recommendations (see Chapter 4 or Appendix I) are specifically tailored to address the concerns and priorities of the community.

Table H.1. Public Outreach Resources

Resource Description	Location/Description	Figure/Page Number(s)	Date
Event Flyer (Owens Valley High School)	Independence and Fort Independence (physical postings and email distributions)	Page H-3	October 19 2022
Community Meeting	Owens Valley High School (in-person event)	Figure H.1	October 25 2022
Community Survey	Independence and Fort Independence (hard copies and online surveys)	See pages H-9 – H-13	October 2022
Request for Public Comments	Inyo County Website	Figure H.2	February 18, 2023
Request for Public Input	Sierra Wave Media Webpage: https://sierrawave.net/inyo-county-requests-public-input-for-community-wildfire-protection-plan/	Figure H.3	February 27, 2023
Press Release	Inyo County Website	Figure H.4	February 27, 2023
Open House	Owens Valley High School (in-person event for public review of the draft CWPP)	Figure H.5	March 2023

Independence Fire Safe Council

Public Meeting

Tuesday October 25

6:30 pm

Owens Valley School Multipurpose Room

Come Learn About Our

Community Wildfire Protection Plan

For Independence, Fort Independence, Oak Creek, and Seven Pines

With Whitebark Institute and SWCA Environmental Consultants

We want to hear from you!

Please complete our online survey at

https://forms.gle/uFSxJds3bZtciKSC9

or contact as at indyfsc@gmail.com for copy

Figure H.1. Community event at Owens Valley High School.

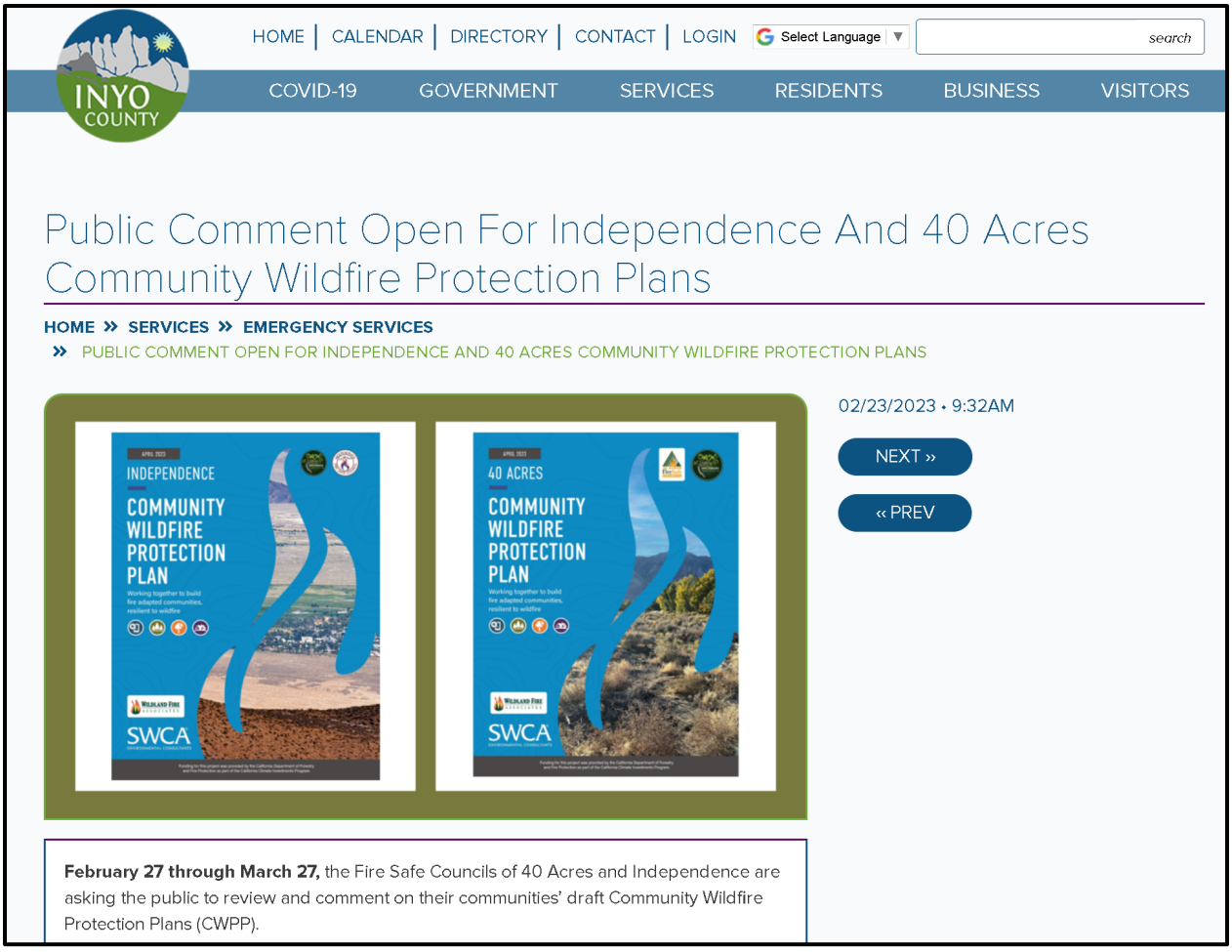


Figure H.2. Announcement that CWPP is open for public comment on Inyo County website.

Inyo County Requests Public Input for Community Wildfire Protection Plan

by **Press Release** on February 27, 2023 in **Community Event, Inyo County, Public Event**

Public Comment Open for Community Wildfire Protection Plans

Independence and 40 Acres Fire Safe Councils seek your feedback

Wildfires are continuously knocking at our doors. It is imperative that we come together as neighbors, land managers, and responders to ensure our communities can thrive alongside wildfire. Community wildfire protection planning is one of the most important components of a wildfire safety strategy. Curious what these robust plans look like?

February 27 through March 27, the Fire Safe Councils of 40 Acres and Independence are asking the public to review and comment on their communities' draft Community Wildfire Protection Plans (CWPP). These CWPPs, along with instructions for submitting comments, will be available online at the Inyo County Office of EmergencyServices website (https://www.inyocounty.us/services/emergency-services). Hard copies will be available at the public library in Independence and other sites that will be listed on the County website. An open house in Independence will also be held on Tuesday, March 7, 2023 from 5-7 p.m. at the Owens Valley School Multi- Purpose Room to gather community input.

Figure H.3. Announcement on the Sierra Wave requesting input from the public.

Nate Greenberg
County Administrative Officer and
Director of Emergency Services

Mikaela Torres
Emergency Services Manager
mtorres@inyocounty.us

INYO COUNTY
Office of Emergency Services

FOR IMMEDIATE RELEASE
February 27, 2023

FOR MORE INFORMATION, CONTACT:
Wildfire Preparedness Coordinator Kristen Pfeiler, (760) 878-8444

Public Comment Open for Community Wildfire Protection Plans

Independence and 40 Acres Fire Safe Councils seek your feedback

Wildfires are continuously knocking at our doors. It is imperative that we come together as neighbors, land managers, and responders to ensure our communities can thrive alongside wildfire. Community wildfire protection planning is one of the most important components of a wildfire safety strategy. Curious what these robust plans look like?

February 27 through March 27, the Fire Safe Councils of 40 Acres and Independence are asking the public to review and comment on their communities' draft Community Wildfire Protection Plans (CWPP). These CWPPs, along with instructions for submitting comments, will be available online at the Inyo County Office of Emergency Services website (https://www.inyocounty.us/services/emergency-services). Hard copies will be available at the public library in Independence and other sites that will be listed on the County website. An open house in Independence will also be held on Tuesday, March 7, 2023 from 5-7 p.m. at the Owens Valley School Multi-Purpose Room to gather community input. A similar event at 40 Acres will be held on March 4, 2023 from 1-3 p.m. at Kay Ogden's home and virtually on March 8, 2023 from 6- 7:30 p.m.

These CWPPs will allow 40 Acres and the greater Independence area to plan and prioritize projects that can make a difference in protecting homes, residents, and first responders in the event of a wildfire. These CWPPs consist of a description of the wildland urban interface (WUI) and the fire environment, a risk-hazard assessment and analysis, mitigation strategies, and project tracking and monitoring strategies.

Now is a great time to get familiar with these plans, as Inyo County embarks on updating the countywide CWPP this year. Public involvement in developing CWPPs is a foundational component, and there will be many opportunities for input.

Figure H.4. Press release from Inyo County OES announcing the CWPP public review period.

Figure H.5. Community open house at the Owens Valley High School for the public review period of the draft CWPP.

COMMUNITY SURVEY RESULTS

Independence CWPP

Survey Responses: 54

November 2022

Question 1. Please enter as much information about your home location as possible (If you wish to remain anonymous, please provide general location information)

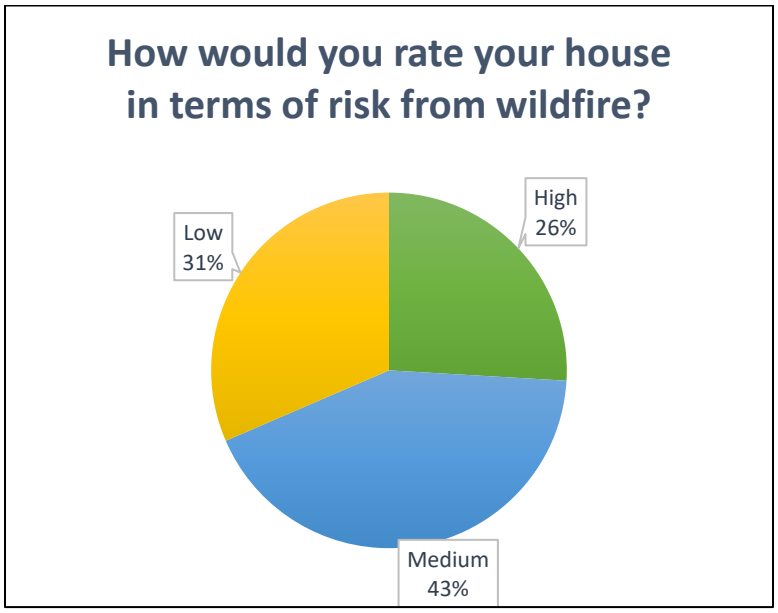
Addresses removed for privacy

Question 2. 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



Question 3. My home is vulnerable to wildfire because of…… (*Select all that apply*)

_____ 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?)

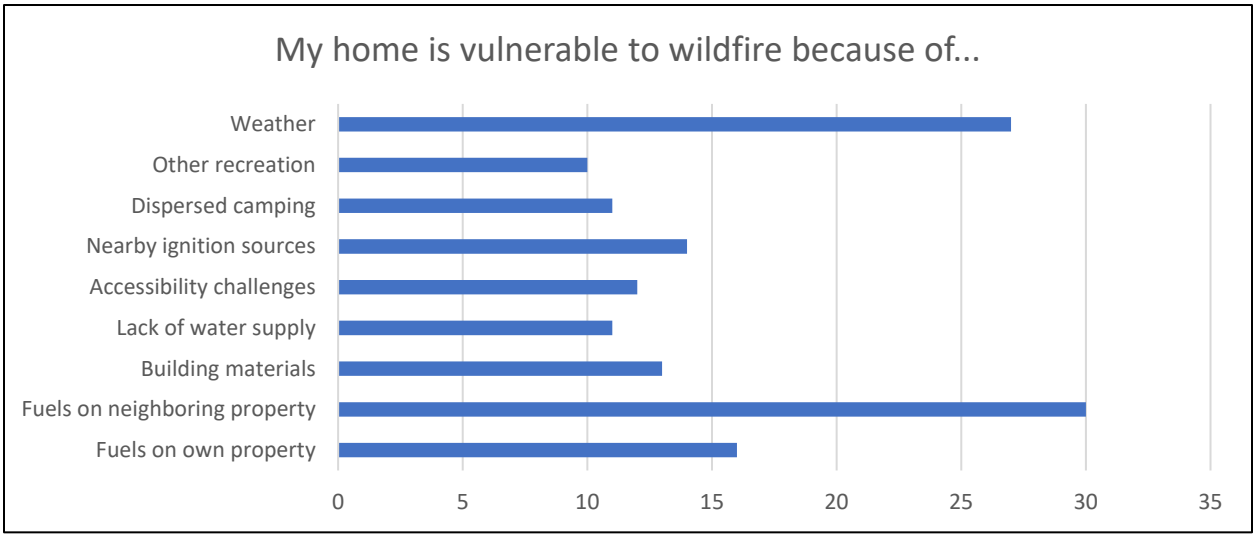
_____ Ignition sources from neighboring areas - (i.e., disposal of cigarette butts from trails or roads)

_____ Dispersed camping

_____ Other forms of recreation (i.e., hunting, off-roading, etc.)

_____ Weather (wind, drought)

_____ Other: _____

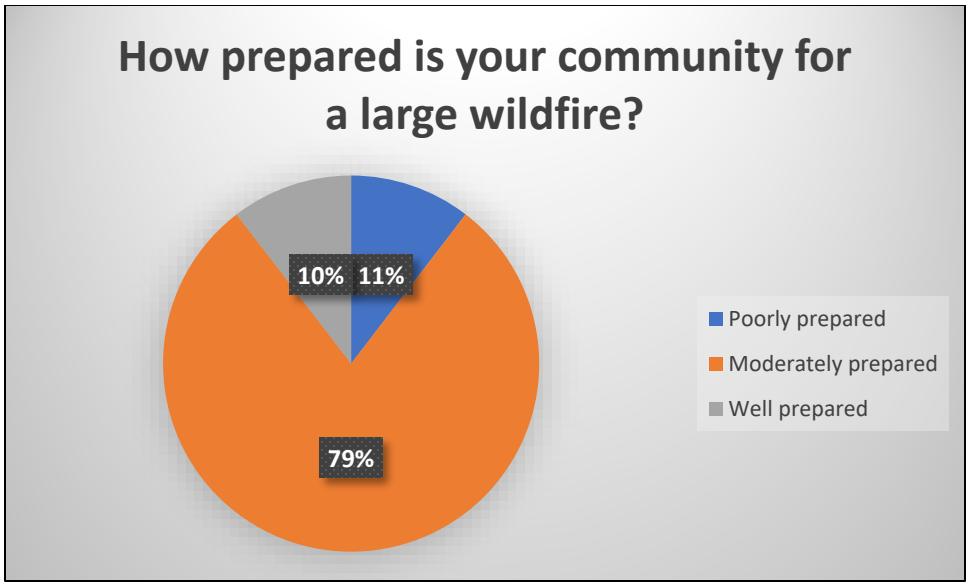


Question 4. How prepared is your community for a large wildfire? (*Select one*)

_____ Poorly prepared

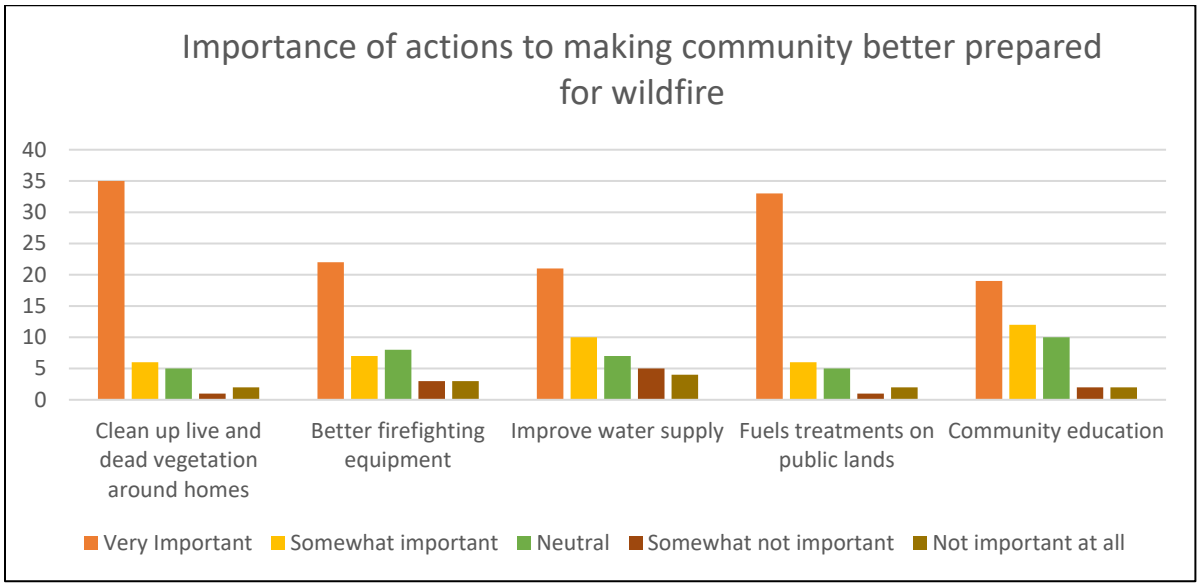
_____ Moderately prepared

_____ Well prepared



Question 5. Score each of the following actions from 1 to 5 in its importance to making the community better prepared for wildfire (1=not important, 5=very 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, 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



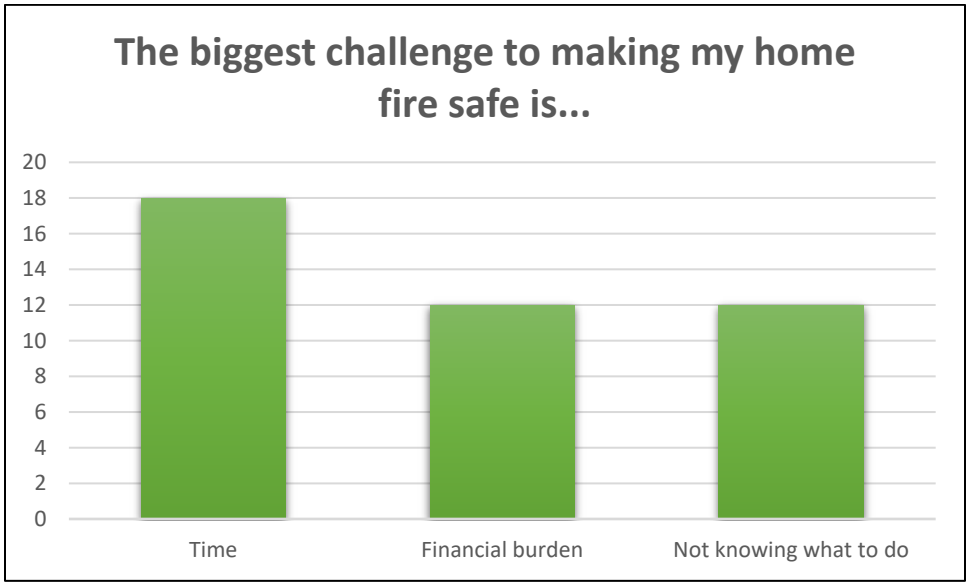
Question 6. My biggest challenge to making my home fire safe is…. (*select all that apply*)

_____ Time

_____ Financial burden of carrying out mitigation measures and maintaining clearance

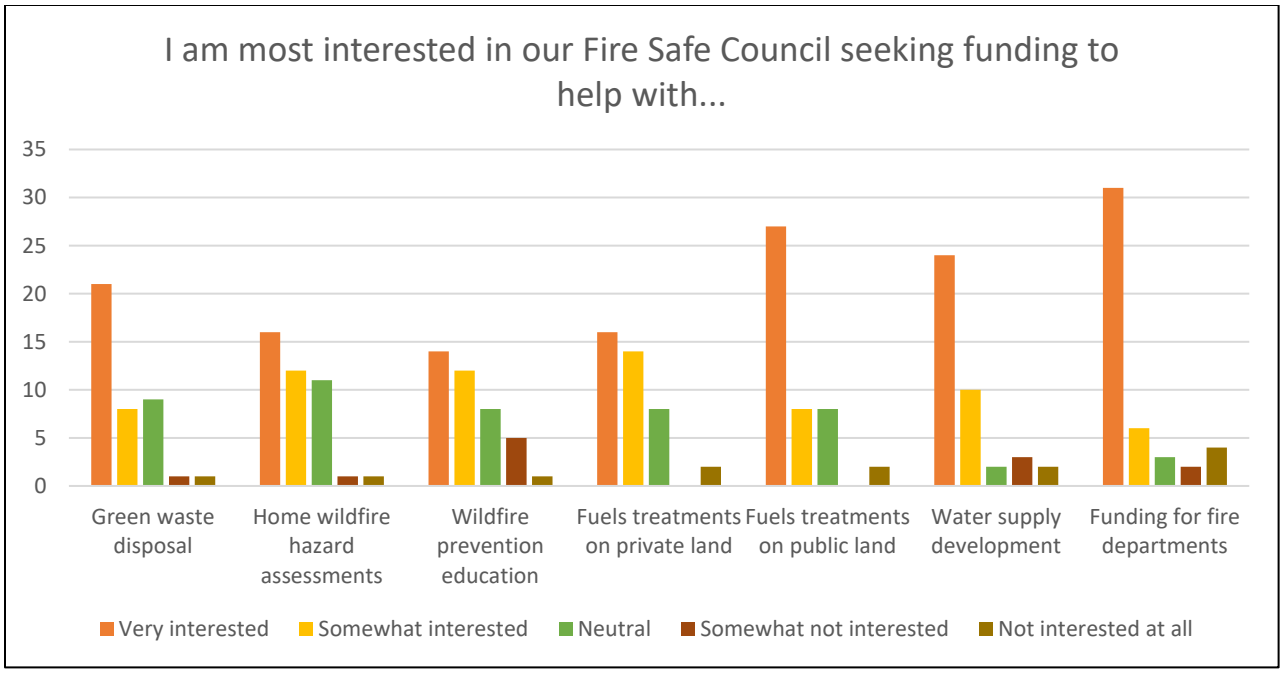
_____ Not knowing what to do

_____ Other: _____



Question 7. I am most interested in our Fire Safe Council seeking funding to help with: (*Please score 1-5, 1=not interested, 5=very interested*)

_____ 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)



Question 8. Do you burn on your property?

Yes _____
No _____

All who responded answered "No".

Question 9. Name any community resources you would most like to see prioritized for protection from wildfire (*e.g., natural areas, cultural sites, town infrastructure, parks, campgrounds*).

Please note that written comments and responses are in the project files and are available upon request.

Question 10. Any other comments?

Please note that written comments and responses are in the project files and are available upon request.

STAKEHOLDER OUTREACH

To convene an all-inclusive Core Team, SWCA, the Whitebark Institute, and the Independence FSC conducted extensive stakeholder outreach that consisted of emails, calls, video conferencing, and in-person meetings with personnel from the local government, local tribe (Fort Independence), private entities, fire organizations, and federal land managers (see Figure H.2).

Figure H.6. Independence second Core Team meeting (October 27, 2022).

APPENDIX I:

Project Recommendations

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Table I.1. Recommendations for Creating Resilient Landscapes (Hazardous Fuels Reduction)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
CRL #1		H	Fall 2024	Selective thinning and removal of dead and downed vegetation, particularly light fuels (small branches, twigs, dead brush) along ditches and creeks. Consider selective and strategic removal of larger dead logs to enhance firefighter access. Refer to Figure 4.1	Along ditches and creeks, focusing on Valley View Ditch	Lessee, CDFW, USFS, BLM, LADWP (to grant access and to coordinate)	• Work with CDFW to determine feasible projects • Treatment methods could include hand thinning and prescribed fire when appropriate • Consider creating breaks for fire apparatus access	• Limit the spread and intensity of wildland fire and increase access to water resources through strategic placement of fuel breaks • Provide for safe and effective wildfire response capabilities	• Frequent maintenance since riparian vegetation grows quickly	• CAL FIRE Forest Health Grants • California EPA Loans and Grants • U.S. Forest Service Community Wildfire Defense Grant (USFS CWDG) • California Climate Investments Fire Prevention Grant Program (CAL FIRE) • LADWP can provide letters of support for grant applications
CRL #2		H	Winter 2023	LADWP to continue with scheduled maintenance of the tree lot (LADWP has the responsibility and is managing the tree lot) Refer to Figure 4.1	Tree lot	LADWP, Inyo County	• Inyo County Wildfire Preparedness Coordinator to lead engagement with LADWP • Provide public access to firewood from the woodlot, prioritizing low-income households and seniors • Manage the tree lot for multiple objectives (e.g., public use, wildlife habitat, fire risk reduction) • Identify a collaborative planning & management team that includes LADWP and community members to maintain healthy trees • Consider contracting with local, knowledgeable individuals or businesses to conduct semi-annual clean up or work • Conduct a community survey to determine the desired condition for the tree lot	• Enhance wildlife habitat and community green space • Balance the reduction of hazardous fuels with the protection of wildlife habitat	• Yearly maintenance	Not applicable
CRL #3	H	Winter 2024	Work with the lessee to reduce dry grass and shrub fuel loading by irrigation or grazing Refer to Figure 4.1	Grass lot parcel by North Clay and Market Street	LADWP (to coordinate) /Lessee, Inyo County,	• Implement grazing plans to reduce the height and fuel loading of dry grass and remove weeds and/or establish irrigation to regreen the parcel • Work with LADWP and lessee to ensure that the vegetation management requirements in the LADWP lease agreement are being followed • Collaborate with the lessee to determine priorities	• Reduce fuel loading within the community	• Yearly maintenance	Not applicable
CRL #4	H	Winter 2025	Install a fuel break to connect CAL FIRE's Artesian rangeland improvement project to the alfalfa fields Refer to Figure 4.1	Independence east	LADWP (to grant access and to coordinate), Zack Smith (rancher), CAL FIRE	• Coordinate fuel reduction efforts between LADWP and private landowners	• Reduce fuel continuity within the community and create resilient landscapes	• Yearly maintenance	• CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC) • LADWP can provide letters of support for grant applications

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
CRL #5	Ongoing	H	According to project schedule	Continue implementation of the Artesian Valley Rangeland Improvement Project Refer to Figure 4.1	East of Independence and Fort Independence	LADWP (to grant access and to coordinate), CAL FIRE	• Continue executing project plan.	• Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI	• As scheduled	• CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC)
CRL #6	Ongoing	H	Winter 2024	Maintain the Onion Valley Rd fuel break and extend it around the southwestern corner of town to U.S. Highway 395 Refer to Figure 4.1	Northwestern and southwestern portions of Independence	LADWP (to grant access and to coordinate), CAL FIRE	• Hire contractor or CAL FIRE to do hand thinning (85% reduction) • Work with wildlife non-profit organizations to ensure that projects align with wildlife habitat objectives	• Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI • Balance the reduction of hazardous fuels with the protection of wildlife habitat	• Yearly maintenance	• CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC) • LADWP can provide letters of support for grant applications
CRL #7		H	Winter 2024	Reduce fuel loading and ladder fuels along riparian corridor as well as other key areas Refer to Figure 4.1	Seven Pines	Inyo National Forest, I Cabin Owners Association, CDFW, Independence Volunteer Fire Dept.	• Independence FSC and Cabin Owners Association to work with USFS to identify hazard and implement treatments • Look for opportunities to open natural breaks in vegetation along the creek, particularly to the east of Seven Pines (where dispersed camping exists) and west (downslope from Onion Valley Road) • Investigate feasibility of clearing light timber litter along the creek • Explore feasibility of reducing fuel loads along Seven Pines Road • Investigate opportunities to reduce ladder fuels in strategic areas (e.g., near cabin tracts and along the creek) • Consider trimming brush and low hanging branches back along the dirt roads inside the community • Identify projects that align with oak protection (e.g., post-fire debris flow oak replanting) • USFS to investigate potential NEPA categorical exemptions that apply for fuels reduction projects	• Protect life and property by mitigating fuels • Provide defensible space for firefighters protecting structures • Ensure the protection of vulnerable ecosystems and values at risk	• Yearly review and maintenance	• CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC)
CRL #8	M	Winter 2025	Develop restoration projects that serve to enhance creek and habitat health	Fort Independence, Oak Creek, Mt. Whitney Fish Hatchery, Independence Creek	Fort Independence Tribe, BLM, and LADWP (to grant access and to coordinate), Independence FSC, CDFW, USFS	• Design fuels reductions projects that align with land management objectives, e.g., oak tree and sensitive species protection • Consider selective thinning and removal of dead and downed vegetation, particularly light fuels (small branches, twigs, dead brush) • Consider selective and strategic removal of larger dead logs to enhance firefighter access • Work with private property owners in Oak Creek	• Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI • Ensure the protection of vulnerable ecosystems and values at risk	• Yearly review	• California EPA Loans and Grants • CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC) • LADWP can provide letters of support for grant applications

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
CRL #9		M	Fall 2025	Investigate opportunities to implement fuels reduction projects upstream of the planned reservoir to protect water resources	Fort Independence	Fort Independence Tribe, BLM, and LADWP (to grant access and to coordinate), CDFW	• Work with CDFW to determine feasible projects • Select strategic locations for optimal fuels treatments effectiveness, e.g., reduce fuel loading near slopes situated adjacent to catchments to limit intense fire behavior	• Improve the protection of water resources at risk • Create resilient landscapes and address potential for extreme wildfire behavior in and around water resources	• Yearly	• California EPA Loans and Grants • CAL FIRE Grant Programs • USFS CWDG Grants • FEMA Building Resilient Infrastructure and Communities Grant (BRIC) • LADWP can provide letters of support for grant applications
CRL #10		M	Winter 2025	Develop a vegetation management plan	Oak Creek, Mt. Whitney Fish Hatchery	Fort Independence, LADWP, private homeowners, BLM, USFS and CDFW	• Create a vegetation management plan for the area that emphasizes watershed health, wildlife habitat protection, and hazardous fuel management • Establish a maintenance schedule	• Ensure the protection of vulnerable ecosystems and values at risk • Balance the reduction of hazardous fuels with the protection of wildlife habitat	• Revise plan every 5 years	• California Climate Investments Fire Prevention Grant Program (CAL FIRE) • USFS CWDG Grants • BRIC • LADWP can provide letters of support for grant applications
CRL #11		H	Winter 2024	Reestablish the Upper Grays Meadows fuel break Refer to Figure 4.1	Seven Pines	USFS and Cabin Owners Association	• USFS to prioritize the NEPA permitting process for the project due to the high prevalence of dispersed camping and high fire risk in the area • USFS to investigate potential NEPA categorical exemptions that apply for the reestablishment of fuel breaks	• Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI. • Protect life and property by mitigating fuels • Provide defensible space for firefighters protecting structures	• Yearly maintenance	• USFS CWDG Grants • CAL FIRE Grant Programs • BRIC • LADWP can provide letters of support for grant applications
CRL #12		H	Winter 2024	Host chipper days for green waste disposal	All communities	Inyo County, BLM, USFS, CAL FIRE, Fort Independence	• County to investigate how to acquire, rent, or borrow a chipper from BLM, USFS, or CAL FIRE • Independence FSC to coordinate/establish chipper days for the communities • Fort Independence Tribe to acquire a chipper and explore options to collaborate with Independence for green waste disposal efforts • County to acquire a chipper, splitter, and other equipment needs to assist defensible space efforts • Consider liability concerns if trained personnel are not on-site to operate equipment • Focus efforts on assisting socially vulnerable populations	• Support community defensible space efforts • Reduce fuel loading within the community	• Springtime, yearly	• CFSC Grants • Firewise Grants • CAL FIRE Grant Programs • USFS CWDG
CRL #13		H	Winter 2023	Continue to offer green-waste voucher program	Independence, Seven Pines	Independence FSC, Inyo County OES	• Use existing funding source and identify new sources	• Support community defensible space efforts	• In the spring, prior to the fire season	• CFSC Grants • Firewise Grants • USFS CWDG

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources

CRL #14		H	Winter 2024	Address fuel loading in Fort Independence and surrounding area (Mt. Whitney Fish Hatchery and Oak Creek)
				Refer to Figure 4.1
					Fort Independence	Fort Independence, LADWP (to grant access and to coordinate) /lessee, CDFW, BLM, USFS	• Create and maintain proper clearance along roadways (Fort Road, Miller Lane, and others)
							• Develop a community-wide vegetation management program to address dead and dying trees and brush
							• Implement defensible space standards to manage trees and brush on private properties
							• Install fuel breaks around residential perimeters and critical infrastructure (tribal administrative headquarters, dispensary, Oak Creek, etc.)
							  ○ Investigate viability of mimicking the Onion Valley Road fuel break
							• Reduce fuel loading along creeks and ditches
							  ○ Selective thinning and removal of dead and downed vegetation, particularly light fuels (small branches, twigs, dead brush); consider selective and strategic removal of larger dead logs to enhance firefighter access
							• Install fuel breaks around the Mt. Whitney Fish Hatchery on the north side (between the hatchery building and Oak Creek)
								• Protect life and property by mitigating fuels
								• Support community defensible space efforts
								• Reduce fuel loading within the community
								• Enhance ingress and egress
									• Yearly assessment	• USFS CWDG Grants
										• CAL FIRE Grant Programs
										• BRIC
										• CFSC Grants
										• Firewise Grants
										• LADWP can provide letters of support for grant applications

Table I.2. Recommendations for Fire-Adapted Communities (Structural Ignitability and Public Education and Outreach)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC #1		H	Winter 2023	Inform the public on how to mitigate risk and damage from wildfire	All communities	Independence FSC, Inyo County Wildfire Preparedness Coordinator, and Fort Independence	• Create wildfire information and education documents for distribution • Increase awareness and knowledge through community workshops and training classes on defensible space, fire safe landscaping, and structural hardening concepts • Provide a printed list of mitigation measures to homeowners. Utilize Ready, Set, GO! Literature. Utilize list of actions broken down by cost • Provide community-specific homeowner education media, including videos (demonstration projects on private property) • Work with fire departments to create a checklist of what responders look for during triage so the public can see what responders look for • Ensure that all interactions result in follow-up engagement by collecting contact information for residents interested in action • Fort Independence Tribe to use EPA GAP funding to conduct public outreach and education • Seek opportunities to work with the Whitebark Institute for defensible space and home hardening workshops and/or community demonstrations • Engage residential and business absentee landlords in Independence (refer to FAC #5 for outreach methods)	• Reduce wildfire risk through community collaboration • Protect communities and valued resources by raising awareness of community residents and those staying in the area about actions that can prevent fires	• Review and revise strategy on an annual basis	• FEMA Building Resilient Infrastructure and Communities (BRIC) Grants • EPA Environmental Education Grants • Firewise Grants • CAL FIRE Grant Programs • CFSC Grants • USFS CWDG
FAC #2	H	Spring 2024	Assess feasibility for Firewise Community Certification for Independence		Independence	Independence FSC	• Work with Firewise USA, the California FSC, and the Inyo County Wildfire Preparedness Coordinator to begin the process of Firewise certification if community supports involvement • Evaluate community interest in Firewise Certification • Engage local, county, and state stakeholders • Conduct a cost-benefit analysis of forming a Firewise certified community	• Reduce wildfire risk through community collaboration • Facilitate access to funding and assistance • Develop a framework for action	Maintain “good standing” by reporting work completed and accomplishments on an annual basis	• Firewise Grants • CFSC Grants • USFS CWDG

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC #3		H	Winter 2024	Implement community events focused on vulnerable populations	All communities	Independence FSC, Fort Independence, and Inyo County Wildfire Preparedness Coordinator	• Identify volunteers • Work with the Tribe's quarry staff to solicit volunteers • Host a community-led day of yard cleanup with fire mitigation in mind to encourage large numbers within the community to carry out mitigation measures and implement defensible space • Residents to assist elderly, disabled, or vulnerable neighbors • Continue to expand translation services for future mitigation events	• Reduce wildfire risk through greater adoption of Firewise and structure hardening measures.	• Yearly, in preparation for the fire season • Conduct annual review to determine what works and what doesn't	• FEMA BRIC Grants • CAL FIRE Wildfire Prevention Grants • CFSC Grants • USFS CWDG
FAC #4		H	Winter 2024	Investigate 1) opportunities to offer financial assistance for defensible space work to seniors and low-income individuals and 2) how to use community-wide benefits to motivate individuals to create defensible space	All communities	Inyo County Wildfire Preparedness Coordinator, Independence FSC, Inyo-Mono Area Agency on Aging	• Independence FSC to work with the County to identify funding opportunities • Independence FSC to identify methods to incentivize homeowners to create defensible space • Identify grants for the FSC to hire contractors to perform defensible space work • Seek opportunities to partner with Team Rubicon (https://teamrubiconusa.org/) for free wildfire mitigation support	• Assist vulnerable populations with wildfire risk reduction • Support community defensible space efforts • Reduce fuel loading within the community	• Establish a program to determine frequency of activities	• Firewise Grants • CAL FIRE Wildfire Prevention Grants • CFSC Grants • USFS CWDG
FAC #5		H	Winter 2023	Involve second-home owners and absentee homeowners, including LADWP land lessees, in wildfire education and mitigation efforts	All communities	Inyo County Wildfire Preparedness Coordinator, Independence FSC, Fort Independence	• Inyo County Wildfire Preparedness Coordinator to update Independence FSC 2021 mailing list of second homeowners using county assessor's 2022 data • Include 7 Pines cabin owners	• Encourage community-wide involvement in wildfire prevention and mitigation efforts	• Biannual	Not applicable
FAC #6		H	Fall 2024	Identify roads and shelter-in place locations and inform residents about evacuation procedures	Seven Pines	Independence FSC, Cabin Owners Association, USFS, Inyo County Wildfire Preparedness Coordinator, Inyo County Health & Human Services	• Collaborate with USFS to discuss and develop evacuation procedures • Identify shelter-in place locations and locate them on a map and distribute to all resident and Include information regarding County designated community shelters. • Distribute evacuation materials using resources from CAL FIRE, Firewise, and Ready, Set, GO! • Increase awareness through community workshops and mock evacuation drills • Discuss different evacuation scenarios during USFS-community walkthroughs • Develop a map that clearly shows all roads with potential ingress and egress points into Seven Pines and distribute to all cabin owners	• Protect life and lessen the risk of entrapment • Improve community preparedness	• Yearly updates	• Firewise Grants • CAL FIRE Wildfire Prevention Grants • CFSC Grants • USFS CWDG

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources

FAC #7			Summer2023	Address dispersed camping issues	Independence	Independence FSC, BLM, USFS, The Mammoth Lakes Trails and Public Access Foundation, Inyo County Supervisors	• Whitebark to investigate feasibility of seeking grants to implement their education program
							• Seek sustained funding sources for “Camp Like a Pro” campaign
							• Implement and/or increase agency patrols
							  ○ Assess feasibility of staffing the Grays Meadows campground during all camping seasons
							• Upgrade campground to improve fire response vehicle access and provide or improve campsite identification signage
							• Create relatively fire-safe camping zones to reduce dispersed camping
							• Reduce the amount of access points to limit potential camp sites
							• Increase fire signage throughout
							  ○ Keep the dispersed camping sign up (in public view) regardless of season
							• Enforce LADWP’s no-camping rules on LADWP land
							• Enforce USFS’s campfire rules – campfires are only permitted in existing campfire rings
							• Work with Inyo National Forest and BLM to explore feasibility of expanding and improving campgrounds to meet demand
							• Implement region specific campfire restrictions within Inyo Forest consistent with earlier timing for dispersed camping in the southern Inyo area
								• Reduce wildfire risk due to dispersed camping
								• Protect communities and valued resources by raising awareness of campers about actions that can prevent fires
									• Establish outreach and education program to determine frequency	• USFS Community Wildfire Defense Grant
										• Federal budgets (USFS, BLM)
										• CAL FIRE Wildfire Prevention Grants

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC #8		H	Spring 2024	Improve wildfire emergency notification systems and wildfire signage (for non-evacuation events)	Independence and Seven Pines	Sheriff's Office and Inyo County OES	• Establish a reliable source (website or notification system) to relay alerts and messages quickly and consistently • Investigate the feasibility of upgrading internet capabilities for emergency notices • Inyo County to work with existing service providers to explore the feasibility of upgrading internet and communications infrastructure (e.g., cell coverage enhancements) • Use electronic signage with custom messages to notify the public about fire and weather conditions • Inyo County to continue the process of upgrading the Inyo OES website • Encourage residents to sign up for public alert notifications though: • WEA-Wireless Emergency Alert system on mobile devices (https://calalerts.org/wea.html#:~:text=WEAs%20are%20designed%20to%20get,sessions%20that%20are%20in%20progress) • Inyo County Code Red Alert and Warning System (https://public.coderedweb.com/CNE/en-US/DAD807D480BF?isMobile=true)	• Provide timely emergency alerts • Facilitate evacuation efforts	N/A	• County budget • CAL FIRE Wildfire Prevention Grants • Fire Management Assistance Grant (FMAG) • USFS CWDG
FAC #9		H	Summer 2023	Maintain defensible space	Seven Pines	Cabin Owners Association and Inyo National Forest	• Work with USFS to identify restrictions • Clear needle and oak leaf litter from the roofs and around the cabins (30-foot perimeter around cabin) • Reduce ladder fuels by clearing dry shrubs and litter from the understory, as well as removing branches in contact with structures • Keep clearance to bare soil (10 feet minimum) around propane tanks and woodpiles	• Reduce wildfire risk through greater adoption of Firewise and structure hardening measures.	• Yearly maintenance	• CFSC Grants • CAL FIRE Wildfire Prevention Grants • Good Neighbor Citizenship Grant • USFS CWDG
FAC #10		H	Fall 2023	Integrate the CWPP with Fort Independence's Wildfire Vulnerability Assessment	Independence	Independence FSC, Fort Independence Tribe, Independence Volunteer Fire Department, LADWP, CAL FIRE,	• Align wildfire mitigation projects for enhanced protection and prioritization of funding • Investigate opportunities to collaborate on cross-boundary projects • Tribal representation at monthly Independence FSC meetings; and Independence FSC to participate when appropriate at Tribal collaborative functions	• Increase multi-agency collaboration • Facilitate and expedite wildfire mitigation projects	N/A	Not applicable
FAC #11		M	Spring 2024	Implement defensible space around the outbuildings and housing quarters	Mt. Whitney Fish Hatchery	CDFW, Fort Independence Tribe, BLM, USFS, CAL FIRE, Independence Volunteer Fire Department	• Implement defensible space standards on the outbuildings surrounding the hatchery	• Reduce wildfire risk through greater adoption of Firewise and structure hardening measures	• Yearly maintenance	• Firewise Grants • CAL FIRE Wildfire Prevention Grants • CFSC Grants • USFS CWDG

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
FAC #12		H	Spring 2024	Conduct an annual community walkthrough	Seven Pines	Independence FSC, Independence Volunteer Fire Department, CAL FIRE, USFS, Cabin Owners Association	• CAL FIRE and USFS staff to host a community walkthrough day with Cabin Owners Association to determine potential projects and needs for defensible space, fuel breaks, and fire response • USFS to provide a summary of walkthrough findings and a list of suggested mitigation actions to cabin owners	• Reduce wildfire risk through preplanning • Garner buy-in from cabin owners • Establish priorities and wildfire mitigation projects	• Yearly	Not applicable
FAC #13		M	Spring 2025	Address excess rubbish and debris on private property	Independence	Inyo County OES, Inyo County Board of Supervisors	• Investigate the feasibility of establishing a County ordinance to mandate the clearing hazardous rubbish and debris	• Decrease hazardous combustible materials from the community • Enhance community safety	N/A	Not applicable
FAC #14		M	Fall 2024	Establish a community pre-fire plan	Independence	Independence FSC, Independence Homeowners, Fort Independence, Independence Volunteer Fire Department, Inyo County Wildfire Preparedness Coordinator	• Collaboratively develop a pre-fire plan to facilitate neighbor to neighbor information sharing and emergency readiness • Make plans for pet and livestock evacuations (e.g., contacts for evacuation assistance and shelter locations) • Create a map with backup energy sources that are independent of the grid • Distribute pre-fire plans to all residents and place in Airbnb properties • Identify and develop strategy to assist frail and elderly residents that may have special medical needs and may need assistance with evacuation	• Promote community involvement • Improve community preparedness	• Yearly updates	• CAL FIRE Wildfire Prevention Grants • CFSC Grants • Firewise Grants • USFS CWDG
FAC #15		H	Summer 2023	Implement defensible space and periodic yard maintenance	Fort Independence	Fort Independence, private homeowners	• Private homeowners to implement defensible space standards and yard maintenance • Seek opportunities to partner with Team Rubicon (https://teamrubiconusa.org/) for free wildfire mitigation support	• Reduce wildfire risk through greater adoption of Firewise and structure hardening measures	• Yearly maintenance	• Firewise Grants • CAL FIRE Wildfire Prevention Grants • CFSC Grants • USFS CWDG

Table I.3. Recommendations for Safe and Effective Wildfire Response

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
SEWR #1		H	Fall 2024	Acquire new firefighting apparatuses and equipment for Independence Volunteer Fire Department: • brush trucks (Type 3) • water tenders • hoses • nozzles • remote controlled drone • generator	Independence	Independence Volunteer Fire Department	• Investigate funding opportunities • Coordinate with BLM and USFS	• Protect life and property through Improved firefighting response	• Annual assessment of equipment	• GSA-Federal Excess Personal Property (GSA) • FEMA Assistance to Firefighters Grants • California Fire Foundation Grant Program • USFS CWDG
SEWR #2		H	Spring 2024	Install and/or upgrade address signage and signposts	Independence, Fort Independence, Seven Pines	Independence FSC, Fort Independence, private homeowners, Cabin Owners Association	• Independence FSC to investigate the feasibility of establishing an addressing program to offer standardized, reflective address signs to community members • Seven Pines Cabin Owners Association to work with USFS for approval of signpost installation • Explore the feasibility of obtaining Computer Aided Dispatch (CAD) and related devices	• Protect life and property through Improved firefighting response	• As needed	• CFSC Grants • Firewise Grants • CAL FIRE Wildfire Prevention Grants • USFS CWDG
SEWR #3		M	Winter 2023	Repaint, add reflectors, and clear brush around hydrants (as needed)	Independence, Fort Independence	Independence Volunteer Fire Department, County of Inyo Public Works, Independence FSC	• Independence Volunteer Fire Department to take the lead • Assess interest in a joint community, volunteer fire department and County project to address hydrant refurbishing (e.g., “adopt a hydrant” program) • Homeowners are expected to take on the responsibility of knowing the location of the nearest fire hydrant in relation to their property	• Protect life and property though improved firefighting response	• As needed	• California Fire Foundation Grant Program • USFS CWDG
SEWR #4		H	Winter 2024	Develop water sources in the campground at Upper Grays Meadows to fill trucks	Seven Pines	USFS	• Investigate the feasibility of installing two 2,500-gallon water tanks in strategic locations • Explore feasibility of installing a hydrant in Upper Grays Meadow • Cabin owners to purchase a portable water pump with sprinkler system capabilities (string of sprinklers that could cover multiple cabins) that can also be used by fire responders.	• Protect communities and valued resources • Promote firefighter safety	• As needed	• U.S. Forest Service Community Wildfire Defense Grant (USFS CWDG)

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
SEWR #5		M	Spring 2025	Identify Potential Operational Delineations (POD)	Seven Pines	USFS	• Establish PODs and share information with CAL FIRE, Independence Volunteer Fire Department, and BLM to enhance fire suppression efforts • Identify staging areas on Onion Valley Road to reduce congestion of emergency vehicles in the event of a fire • Prepare a pre-attack plan to identify water resources • Once established, utilize PODs as a framing and planning tool to strategize and prioritize efforts across the region and to help formulate fire management planning and operations	• Increase multi-agency coordination • Protect communities and valued resources • Enhance firefighting response	• Yearly review	• USFS CWDG
SEWR #6		H	Spring 2024	Maintain road rights-of-way within the community	Fort Independence	Fort Independence	• Continue mowing of grass fuels and mechanical treatment of shrubs to a minimum of 5 feet from both sides of the road • Clear overhead branches that are encroaching on the right-of-way • Prioritize roads with more residences and limited roadside vegetation clearance	• Enhance evacuation efforts • Improve firefighter safety	• Yearly maintenance	• FEMA Building Resilient Infrastructure and Communities Grants • CAL FIRE Community Wildfire Prevention Grants • USFS CWDG • CFSC Grants
SEWR #7		H	Fall 2024	Increase workforce and retention of firefighting personnel	All	Independence Volunteer Fire Department and CAL FIRE,	• Investigate funding opportunities to fund salary increases (CAL FIRE) • Obtain funding to assist in the payment of training both locally and out of the area • Investigate the feasibility and the level of community support to construct a training facility for south county firefighting personnel • Utilize existing Independence Volunteer Fire Department programs at high schools to recruit junior firefighters • Explore options to establish partnerships or recruitment activities with Cerro Coso Community College	• Reduce wildfire risk through greater capacity for wildfire projects • Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI	• Assess capacity on an annual basis	• FEMA Assistance to Firefighters Grants • California Fire Foundation Grant Program • FEMA Staffing for Adequate Fire and Emergency Response • USFS CWDG
SEWR #8		M	Winter 2023	Provide sufficient clearance between power lines and trees	All communities	LADWP, Independence FSC	• Use LADWP's hotline to report hazard trees that are leaning and/or touching power lines and poles (760) 873-0251 ○ LADWP patrols will evaluate reports and determine if treatment is needed	• Reduce hazard tree encroachment • Enhance firefighter safety	• As needed	Not applicable
SEWR #9		M	Spring 2025	Expand coverage of Alert California live cameras	All communities	Alert California Core University Partners	• Investigate opportunities to install cameras where there is limited coverage	• Enhance wildfire response and readiness • Support early attack plans • Facilitate emergency notifications such as evacuation orders	• Follow existing maintenance schedule	• FEMA Building Resilient Infrastructure and Communities Grants • CAL FIRE Fire Prevention Grants • USFS CWDG

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Partners and/or Collaborating Agencies	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
SEWR #10		M	Spring 2024	Maintain dirt roads and trails	All communities	CAL FIRE, BLM, Inyo County, Fort Independence, LADWP	• Maintain existing road and trail networks using mechanical treatments	• Provide access to fire personnel • Establish fuel breaks and fire containment lines	• Yearly	• U.S. Forest Service Community Wildfire Defense Grant • CAL FIRE Community Wildfire Prevention Grants • FEMA BRIC Grants
SEWR #11		H	Winter 2024	Improve water supply throughout the Fort Independence area	Fort Independence	Fort Independence, LADWP, Inyo County	• Address the low water pressure issue in the hydrant system • Investigate funding opportunities with the department of water resources for upgrading the tribal hydrant system (for a successful example, refer to the Big Pine Tribe's efforts) • Install water tanks in strategic locations as backup water sources	• Protect life and property though improved firefighting response • Improve firefighter safety	• Periodic pressure testing as needed • Track yearly progress	• FEMA BRIC Grants • USFS CWDG

SEWR #12		M	Summer 2025	Assess existing water supply for fire suppression (hydrants)	Fort Independence and Independence	Independence Volunteer Fire Department, Inyo County OES	• Assess the integrity of the hydrant network and its power source
							  ○ The County has generators that can be used during disasters
							  ○ The County has good relationships with LADWP and SCE for additional backup power resources
								• Protect life and property though improved firefighting response	• As needed	• FEMA BRIC Grants
										• USFS CWDG

SEWR #13		M	Fall 2024	Assess opportunities and/or the viability to build a new fire station	Independence	Independence Volunteer Fire Department	• The existing fire station was constructed in the 1960s; its size is inadequate to house newer engines and equipment which are typically larger than equipment from the 1906s • Work with the Wildfire Preparedness Coordinator to seek and funding opportunities	• Protect life and property through Improved firefighting response	• N/A	• California Fire Foundation Grant Program • USFS CWDG • Volunteer Fire Capacity (VFC) Grant
SEWR #14		H	Spring 2024	Establish a dedicated Wildfire Preparedness Coordinator position for Inyo County	Independence	Inyo County	The Wildfire Preparedness Coordinator will serve to support: • Development of annual operating plans • Coordination and cooperation between agencies, organizations, and communities • Implementation of projects identified in this CWPP • Efforts regarding public outreach, awareness, and knowledge • Volunteer fire departments and FSCs with building capacity • Acquisition of grant funding The Wildfire Preparedness Coordinator position is currently grant funded	• Enhance fire prevention and protection efforts • Protect communities and valued resources through code enforcement • Streamline wildfire mitigation efforts • Increase grant opportunities	• N/A	• County budget

APPENDIX J:

Fuel Treatment Types and Methods

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FUELS TREATMENT SCALES AND METHODS

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 J.1).

The definition of defensible space via state and local codes, its maintenance by homeowners, 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 that expanded defensible space clearance requirements from 30 to 100 feet around buildings and structures within SRAs or very high FHSZs within LRAs. PRC Section 4291 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 2022d).

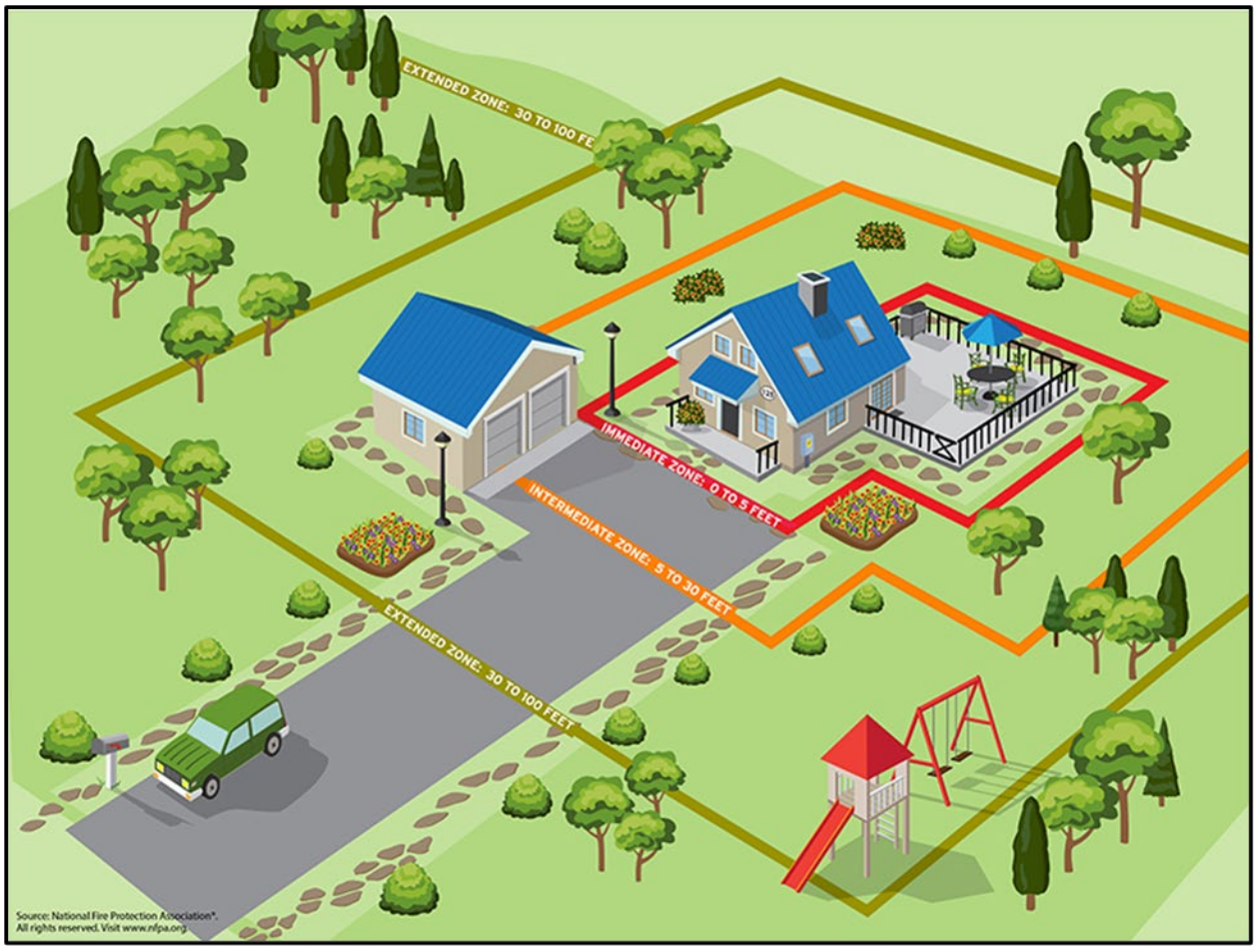

Figure J.1. Defensible space zones providing clearance between a structure and adjacent woodland or forest fuels.
Source: NFPA

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 the 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 (Figure J.2). These components work together in a proven and predictable manner. Zone 1 keeps fire from burning directly to the home; Zone 2 reduces the adjacent fire intensity and the likelihood of torching, crown fire, and ember production; and Zone 3 does the same at a broader scale, keeping the fire intensity lower by maintaining a more natural, historic condition (Figure J.2).

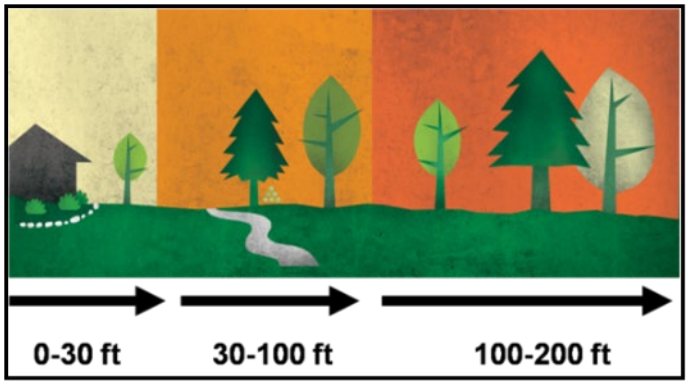

Figure J.2. Defensible space zones.
Source: Firewise.org

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 2022d):

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 2022d):

- 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 2022d):

- 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 2022d):

- 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 (Figure J.3).
    - 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 (Figure J.4).
    - 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 2022d).

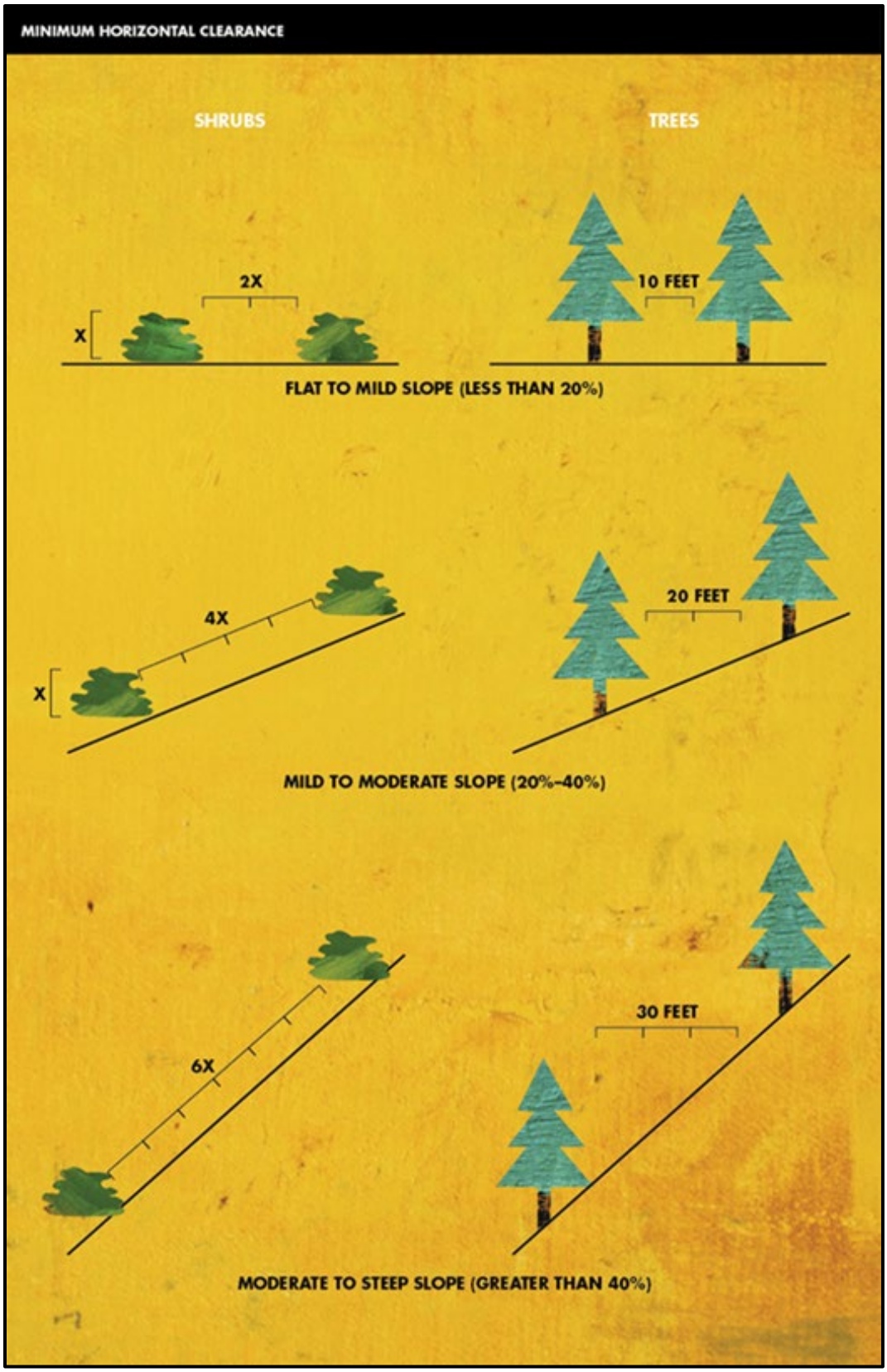

Figure J.3. Minimum horizontal clearance.
Source: CAL FIRE 2022d

Figure J.4. Minimum vertical clearance.
Source: CAL FIRE 2022d

Specific recommendations should be based on the hazards adjacent to a structure such as slope steepness and fuel type. Firewise guidelines and the Homeowner Resources appendix (see Appendix G) are excellent resources but creating defensible space does not have to be an overwhelming process. The NFPA offers a free Community Wildfire Risk Assessment Tutorial and an online learning module: Understanding the Wildfire Threat to Homes. Both tools are great resources for learning about, and implementing, defensible space.

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 J.1).

Table J.1. 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 6-inch reflective address numbers visible from road.

Year	Project	Actions
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 catch those that were bypassed.

FUEL BREAKS AND OPEN SPACE CLEANUP

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 (also known as shaded fuel breaks) are strips of land where fuel (for example, 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 are removed down to mineral soil. Also, firebreaks are typically used after the fire (for suppression purposes) and fuel breaks are usually installed before fires occur (to reduce extreme fire behavior). 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.

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.

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.
	Install an environmentally appropriate xeriscape yard instead of grass
	Screen vents with non-combustible meshing with mesh opening not to exceed nominal 1/8-1/16-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.

Additional resources regarding home hardening can be found in Appendix G.

FUEL TREATMENT METHODS

Since specifics of the treatments are not provided in detail in Table J.2, different fuels reduction methods are outlined in the following narrative.

Several treatment methods are commonly used for hazardous fuels reduction, including manual treatments, mechanized treatments, prescribed fire, and grazing (Table J.2). 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 and type 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. In addition, post-treatment fuel clean-up is a must as neglected piles of vegetation may result in increased fire risk.

Table J.2. Summary of Fuels Treatment Methods

Treatment	Comments
Machine mowing	Appropriate for large, flat, grassy areas on relatively flat terrain.
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.
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.
Prescribed fire	Can be very cost effective for public land but not close to the city. Ecologically beneficial. Can be used as training opportunities for firefighters. May require manual or mechanical pretreatment. Carries risk of escape. Unreliable scheduling due to weather and smoke management constraints.
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 beneficial. 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 (ground-up timber), 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. Where possible, prescribed fire could occur on public land since fire is ecologically beneficial to this fire-adapted vegetation community and wildlife habitat. CAL FIRE, USFS, and BLM are already implementing prescribed burning in the region.

All prescribed fire operations will be conducted in accordance with federal and state guidelines, laws, and regulations. Public safety would be the primary consideration in the design of any prescribed burn plan so as to not negatively impact the WUI. Agency use of prescribed fire on public land would be carried out within the confines of the agency's fire management planning documents and would require individual prescribed burn plans that are developed for specific burn units and consider smoke management concerns and sensitive receptors within the WUI. Smoke monitors could be placed in areas where smoke concerns have been raised in the past.

Following any type of fuels reduction treatment, post-treatment monitoring should continue to ensure that management actions continue to be effective throughout the fire season. The vegetation within this ecosystem can change rapidly in response to drought or moisture from year to year and during the course of the season, so fuels treatments should be adjusted accordingly. To learn more about firing techniques, visit the EFIRE Fire Techniques webpage: https://efire.cnr.ncsu.edu/efire/fire-techniques/.

Several burns may be needed to meet full resource management objectives, so a solid maintenance plan is needed to ensure success.

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, 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 done 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 on Communities

Prescribed fires can have impacts on air quality that may impact local communities. Impacts on a regional scale are typically only acute when many acres are burned on the same day. Local problems are occasionally acute due to the large quantities of smoke that can be produced in a given area during a short period of time. Residents with respiratory problems may be impacted during these burning periods since smoke consists of small particles of ash, partly consumed fuel, and liquid droplets that are considered air pollutants. Other combustion products include invisible gases such as carbon monoxide, carbon dioxide, hydrocarbons, and small quantities of nitrogen oxides. Oxides of nitrogen are usually produced at temperatures only reached in piled or windrowed slash or in very intense wildfires that are uncommon in the region. In general, prescribed fires produce inconsequential amounts of these gases. Inappropriate management of prescribed fires can be bothersome to residents, and it 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 point where it exceeds air quality standards (California Air Resources Board [CARB] 2003). Therefore, effective smoke management is a vital component of planning and conducting prescribed fires (Figure J.5). The California Air Resources Board has smoke management guidelines that protect the health and welfare of Californians from the impacts of smoke (CARB 2001). In Inyo County, a permit from the local fire agency must be obtained to start a prescribed burn and can only do so during “permissive burn days,” which are determined by the State Air Resources Board or the local air district (Great Basin Unified Air Pollution Control District n.d.).

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.

Effects of smoke can be managed by burning on days when smoke will blow away from smoke-sensitive areas. Precautions are taken when burning near populated areas, highways, airports, and other smoke sensitive areas. Any smoke impact downwind is considered before lighting a fire. Smoke management is a significant component of all prescribed burn plans. Other mitigating actions include alerting the public of upcoming burning activities, including the purpose, best conditions for ensuring good smoke dispersal, duration, size, and location of projects. Local radio, newspapers, social media, and TV can provide broad coverage for alerts. Land management agencies in the Planning Area consistently work with concerned citizens regarding smoke management and attempt to provide solutions such as the placement of smoke monitors at sensitive sites.

Figure J.5. Photograph showing a CAL FIRE crew carrying out pile burns for the Onion Valley fuel break.
Source: https://www.eswildfirealliance.org/independence-fsc

Thinning and Prescribed Fire Combined

Combining thinning and prescribed fire can be the most effective treatment (Graham et al. 2004). In forests where fire exclusion or disease has created a buildup of hazardous fuels, prescribed fire cannot be safely applied, and pre-burn thinning is required. The subsequent use of fire can further reduce residual fuels and reintroduce this ecologically imperative process.

MANAGEMENT OF NONNATIVE PLANTS

The USDA maintains a list of introduced, invasive, and noxious plants by state (USDA 2022). Fuel treatment approaches should always consider the potential for introduction or proliferation of invasive nonnative species as a result of management actions.

APPENDIX K:

Post-fire Response and Restoration

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POST-FIRE RESPONSE AND REHABILITATION

Large and high-severity wildfires can strip terrain of stabilizing vegetative cover, decreasing the water-retention capacity of hillsides and increasing the probability of debris flows during large, high-intensity runoff events. Debris flows can be landscape-altering occurrences that degrade and further destabilize habitat during critical post-fire recovery periods while also posing threats to life and property. In southern California, post-fire debris flows have been extensively documented, and in 2008, 1 year after the Inyo Complex Fires, massive debris flows developed just northwest of Independence in the North and South Fork Oak Creek drainages of the burn scar. The flows, triggered during a heavy rain event (up to 3.8 inches/hour) associated with the remnants of Hurricane Bertha moving inland from the Gulf of Mexico, ran nearly 4.5 miles onto the floor of the Owens Valley. Boulders up to ~57,000 pounds, large trees, and sediment up to feet deep in spots (Figure K.1) were deposited throughout the drainages and their alluvial fans, reportedly destroying 25 homes, damaging a considerable portion of the Mount Whitney Fish Hatchery facilities (Figure K.2), and causing millions of dollars of damage (Wagner et al. 2012). While events of this scale have been relatively rare since Inyo County has been permanently inhabited, they have occurred repeatedly over geologic history, as evidenced by large alluvial fans throughout the Owens Valley, and are almost certain to occur again in the future, especially considering increasing wildfire danger across the region.

Figure K.1. Heavy sediment was deposited throughout the North and South Oak Creek alluvial fans just northwest of Independence during a large debris flow event in July 2008.
Source: Craig Poole, Independence FSC.

Figure K.2. The 2008 debris flow caused extensive damage, including to the Mount Whitney Fish Hatchery, pictured here.

Source: Unknown photographer

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.
- 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.

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.

Emergency Assistance: Before, During, and After a Fire

Team Rubicon is a veteran-led humanitarian organization that serves communities around the world before, during, and after disasters such as earthquakes, floods, hurricanes, tornadoes, and wildfire. Team Rubicon focuses on serving vulnerable and at-risk populations affected by disasters, and all services are provided free of charge. Services include incident management, debris management, hazard mitigation, volunteer management, home repair, and emergency medicine. With respect to fire-related assistance, Team Rubicon assists with any action that would limit the impact of a wildfire, such as helping homeowners to make their home fire safe, providing staff to assist with mitigation projects (e.g., fuels reduction), and removing debris and hazardous trees (Team Rubicon 2022).

To find out more about Team Rubicon, please visit https://teamrubiconusa.org/capabilities-services/.

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 greater 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 (CA GOPR 2020).

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, check for the following (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
- 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, of both the inside and outside, in preparation of an emergency. 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 (CDI 2021).

Natural disasters aren't always predictable, but there are steps homeowners can make to better prepare for an emergency.

- Review your insurance policy annually to see if your home is adequately insured
- Know your "loss of use" section – this covers living expenses should your home become unlivable due to fire, smoke, or otherwise

You can view a guide on creating a home inventory here: https://www.iii.org/article/how-create-home-inventory

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 (FSCs) to minimize and prevent wildfire losses. FSCs are community-based organizations that mobilize residents to protect their properties, communities, and environments from disastrous wildfires. FSCs 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 (CFSC 2021).

In addition, each 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. USGS
4. Hazardous Waste and Pollution
    a. CalEPA
5. Pets and Livestock
    a. American Society for the Prevention of Cruelty to Animals
    b. CDFA
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. Natural Resources Conservation Service (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
   f. BIA

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.

Post-Fire Rehabilitation and Resources

Wildfires that cause extensive damage necessitate dedicated efforts to avert issues afterwards. As aforementioned, 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 202bc). Following a fire, the primary priority is emergency stabilization to prevent additional damage to life, property, or natural resources. The soil stabilization work starts immediately and may proceed for up to a year.
The rehabilitation effort to restore damage caused by the fire starts after the fire is out and may persist for various years. For the most part, rehabilitation efforts focus on the lands not likely to recover naturally from wildfire damage (USFS 2021d).

The USFS and the Department of Interior (DOI) 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, DOI, and Tribal trust lands and take appropriate actions to mitigate unacceptable risks (NIFC 2022). BAER teams 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 (NIFC 2022).

The 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 for 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 Team (a multi-agency group assembled by the NRCS) to develop specific recovery and treatment plans.

Examples of potential treatments include (USFS 2021e):

- 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 lands 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 2021c). The framework is available at: https://www.fs.usda.gov/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: provides ground cover to reduce erosion by felling trees 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: small dams 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

Private and federal landowners may decide to harvest trees killed in the fire, a decision that can be highly controversial. Trees remaining post-fire can be instrumental for soil and wildlife habitat recovery, but dead standing trees may also pose safety concerns and fuel loadings may still be conducive to future high intensity wildfires. Burned soils are especially susceptible to soil compaction and erosion so it is recommended to have professionals perform the timber salvage. Several programs assist landowners with timber salvage, including the NRCS Environmental Quality Incentives Program (EQIP) (CUSP 2016).

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).

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/.