

APRIL 2023

40 ACRES

COMMUNITY WILDFIRE PROTECTION PLAN

Working together to build
fire adapted communities,
resilient to wildfire



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 40 Acres Fire Safe Council and CAL FIRE (Bishop 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.

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

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

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



The entities listed below participated in the development of and/or reviewed and are in support of the 40 Acres Community Wildfire Protection Plan:

Signature

Signature

Name (printed)

Name (printed)

Date

Date

Agency /Position (printed)

Agency /Position (printed)

Signature

Signature

Name (printed)

Name (printed)

Date

Date

Agency /Position (printed)

Agency /Position (printed)

Signature

Signature

Name (printed)

Name (printed)

Date

Date

Agency /Position (printed)

Agency /Position (printed)

Signature

Signature

Name (printed)

Name (printed)

Date

Date

Agency /Position (printed)

Agency /Position (printed)



CONTENTS

1

2

3

Executive Summary iv

4

Chapter 1 – Introduction 1

5

Goal of a Community Wildfire Protection Plan 2

6

Alignment With the National Cohesive Strategy 2

7

Alignment with Plans and Agreements 3

8

Core Team 4

9

Planning Area 4

10

Land Ownership 4

11

Public Involvement 6

12

Chapter 2 – Fire Environment 7

13

Wildland Urban Interface 7

14

 WUI Land Use 9

15

 Fuels and Topography Within the WUI 11

16

Fire Regimes 11

17

 Shrubland and Grasses 11

18

 Riparian Vegetation 12

19

Climate and Weather Patterns 12

20

Fire History 13

21

 Past Fire Management Policies and Land Management Actions 14

22

 Recent Fire Occurrence 14

23

 Future Challenges 19

24

 Fire Response Capabilities 20

25

Chapter 3 – Risk-Hazard Assessment 21

26

 Purpose 21

27

 Field-based Community Hazard Assessments 22

28

 Composite Risk-Hazard Assessment Inputs 24

1	Fire Behavior Modeling	24
2	Fire Behavior Models	25
3	Fire Behavior Model Inputs	25
4	Fire Behavior Model Outputs	22
5	Composite Risk-Hazard Assessment Results	26
6	Values at Risk.....	29
7	Natural Values at Risk.....	30
8	Socioeconomic Values at Risk.....	31
9	Cultural Values at Risk.....	33
10	Chapter 4 – Mitigation Strategies	34
11	Cohesive Strategy Goal 1: Restore and Maintain Landscapes.....	34
12	Recommendations for Hazardous Fuel Reduction	37
13	Cohesive Strategy Goal 2: Fire-Adapted Communities.....	41
14	Recommendations for Public Education and Outreach	41
15	Recommendations for Reducing Structural Ignitability	42
16	Cohesive Strategy Goal 3: Wildfire Response	45
17	Recommendations for Improving Fire Response Capabilities.....	45
18	Chapter 5 – Monitoring and Evaluation	47
19	Fuels Treatment Monitoring.....	48
20	Implementation	50
21	CWPP Evaluation	50
22	Timeline for Updating the CWPP.....	52

23
24

APPENDICES

25	
26	Appendix A: CWPP Planning Process and Background
27	Appendix B: Community Background Information
28	Appendix C: Additional Mapping
29	Appendix D: Community and Parcel Descriptions and Hazard Ratings
30	Appendix E: Forms
31	Appendix F: Funding Sources
32	Appendix G: Homeowner Resources
33	Appendix H: Project Outreach
34	Appendix I: Project Recommendations
35	Appendix J: Fuel Treatment Types and Methods
36	Appendix K: Post-fire Response and Restoration

37

FIGURES

1

2 Figure 1.1. The CWPP incorporates the three primary goals of the Cohesive Strategy and post-fire
 3 recovery and serves as a holistic plan for fire prevention and resilience. 3

4 Figure 1.2. 40 Acres land ownership. 5

5 Figure 2.1. 40 Acres WUI delineation. 8

6 Figure 2.2. Example of the WUI in 40 Acres (1 of 2). 10

7 Figure 2.3. Example of the WUI in 40 Acres (2 of 2). 10

8 Figure 2.4. Monthly climate normal for the Bishop Airport weather station for 1991 through 2020..... 13

9 Figure 2.5. Historic fire perimeters for 40 Acres from 1923 through 2021..... 16

10 Figure 2.6. Decadal wildfire frequency in 40 Acres (and 20-mile buffer) based on fire history data from
 11 1923 through 2021. 17

12 Figure 2.7. Fire size statistics per decade for 40 Acres (and 20-mile buffer) based on fire history data
 13 from 1923 through 2021..... 17

14 Figure 2.8. Acres burned per decade for 40 Acres (and 20-mile buffer) based on fire history data from
 15 1934 through 2021..... 18

16 Figure 2.9. Monthly fire frequency in 40 Acres (and 20-mile buffer) based on data from 1934 through
 17 2021. 18

18 Figure 2.10. Fire causes for 40 Acres (and 20-mile buffer) from 1934 through 2021. 19

19 Figure 3.1. Effect of topography on fire behavior..... 23

20 Figure 3.2. Composite Risk-Hazard Assessment breakdown. 25

21 Figure 3.3. Composite Risk-Hazard Assessment overlay process..... 27

22 Figure 3.4. Composite Risk-Hazard Assessment. 28

23 Figure 3.5. Example of a natural VAR, public trails. 30

24 Figure 3.6. Example of a socioeconomic VAR, Pine Creek flume, which could be impacted by post-fire
 25 erosion and sedimentation. 32

26 Figure 4.1. Ongoing, planned, and proposed fuels treatments around 40 Acres. Note: the “CRL #” text
 27 refers to the Project ID in Table 4.1. 36

28 Figure 4.2. CEQA process for CalVTP implementation..... 38

29 Figure 4.3. The 7.2-acre fuel break on the west side of 40 Acres. 39

TABLES

30

31

32

33 Table 2.1. Climate Summaries for Weather Stations near 40 Acres 13

34 Table 3.1. Communities at Risk Ratings with Community Hazard Assessment Summary 23

35 Table 3.2. Fuel Model Classification for the Planning Area 21

36 Table 3.3. Risk Assessment Inputs, Sources, and Weights 26

37 Table 4.1. Recommendations to Create Resilient Landscapes (Fuel Treatments) 40

38 Table 4.2. Recommendations for Creating Fire-Adapted Communities (Public Education and Reducing
 39 Structural Ignitability)..... 43

40 Table 4.3. Recommendations for Safe and Effective Wildfire Response 46

41 Table 5.1. Recommended Monitoring Strategies..... 48

42

EXECUTIVE SUMMARY

WHAT IS THE PURPOSE OF THIS COMMUNITY WILDFIRE PROTECTION PLAN?

The purpose of the 2023 40 Acres 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.

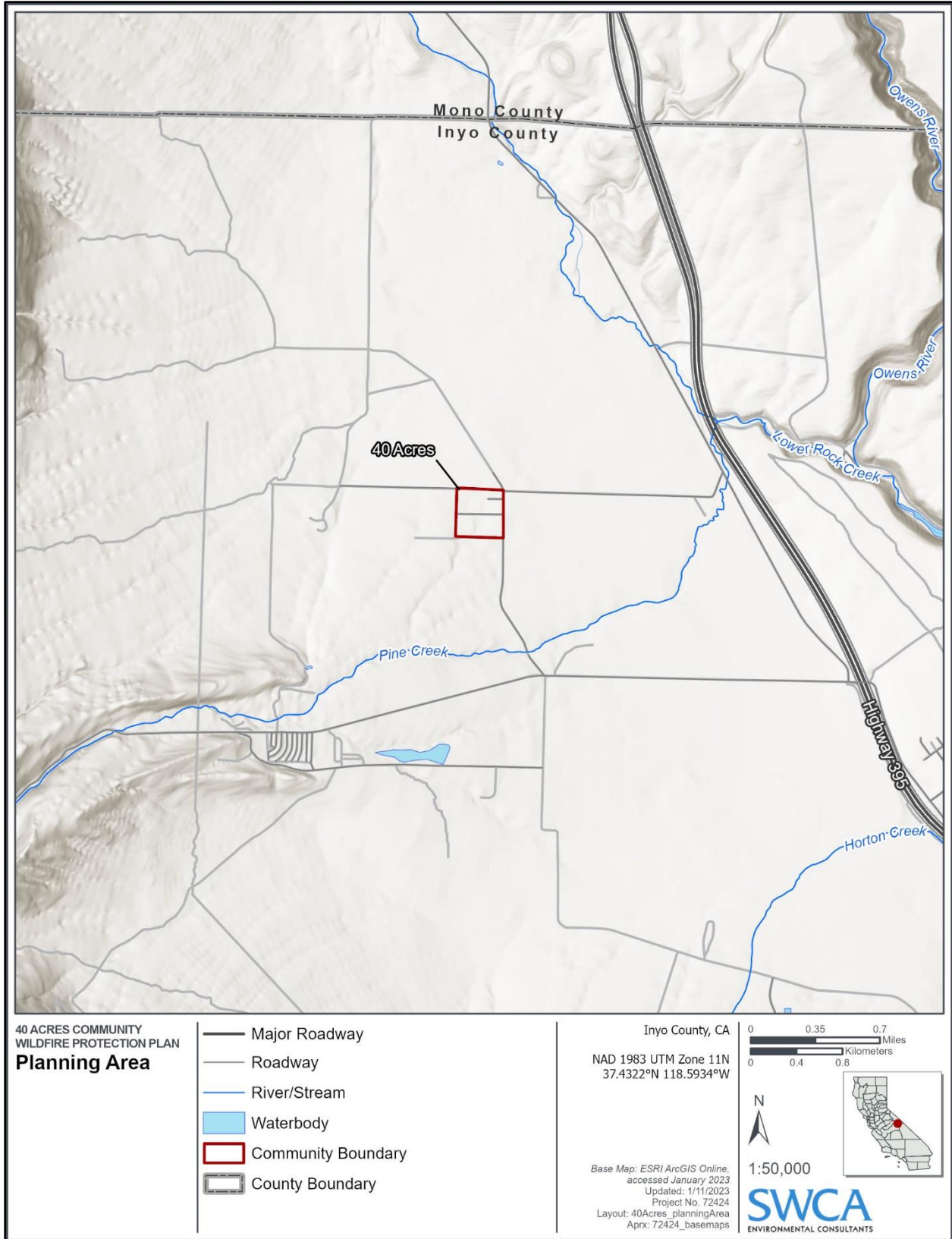
This CWPP aims to assist in protecting human life and reducing property loss due to wildfire throughout the community. This 2023 plan was compiled from reports, documents, and data developed by a wide array of contributors, including input from the Core Team and the public. This plan was compiled in 2022 and 2023 as 40 Acres' 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 40 Acres CWPP.

WHERE IS THE PLANNING AREA?

The Planning Area includes the entire community of 40 Acres and the surrounding area (Figure ES.1).



1

2 **Figure ES 1. 40 Acres CWPP Planning Area.**

1 WHAT ARE THE KEY ISSUES ADDRESSED?

2 Issues addressed in this CWPP include:

- 3 • Fuel treatment recommendations for land management agencies and homeowners to mitigate
4 hazard and risk
- 5 • Prioritizing hazardous fuels reduction in the perimeter of the community and surrounding high-risk
6 areas
- 7 • Ingress and egress issues, including evacuation routes and fire response access
- 8 • Increasing community capacity and participation to accomplish community wildfire protection and
9 prevention objectives
- 10 • Public education and outreach to homeowners, including second-home owners and absentee
11 homeowners, to enable individuals to reduce the risk of fire to their properties, particularly
12 regarding defensible space implementation, structural hardening measures, and community
13 pre-fire planning
- 14 • Constant and consistent messaging for residents and visitors concerning wildfire risks and
15 mitigation strategies
- 16 • Investing and supporting fire response at all levels, including resources for local fire departments
17 to increase capacity to serve the community
- 18 • Increasing public understanding of the fire response process
- 19 • Continuing to address wildfire issues across multiple jurisdictions
- 20 • Managing fire to protect values and accomplish resource management goals, including protection
21 and enhancement of wildlife habitat, water supply and quality, and forest health
- 22 • Recent climate patterns and associated changes to the wildland fire environment
- 23 • Raising awareness about the natural role that fire plays in the ecosystem and maintaining
24 resilient landscapes
- 25 • Disease and insect outbreaks associated with tree mortality

26 HOW IS THE PLAN ORGANIZED?

27 The CWPP provides a Risk-Hazard Assessment, action items, project recommendations, and background
28 information about the community's wildland fire environment as well as land management plans and
29 agencies. Most of the background information is housed in several appendices.

30 **Chapter 1** provides a general overview of CWPPs, the Core Team, Planning Area, land ownership, and
31 public involvement.

32 **Chapter 2** presents an overview of the wildland urban interface (WUI) and fire environment and specific
33 information about vegetation and fire history as well as fire management and response.

34 **Chapter 3** describes the Risk-Hazard Assessment, results of the assessment, and community values at
35 risk.

- 1 **Chapter 4** provides mitigation strategies in accordance with the National Cohesive Wildfire Strategy as
2 well as post-fire protocols and rehabilitation strategies.
- 3 **Chapter 5** presents monitoring strategies to assist in tracking project progress and in evaluating work
4 accomplished.
- 5 **Appendix A** contains background information on the planning process steps; state, municipal, and
6 federal wildfire policy and direction; past planning efforts; and an overview of current land management
7 strategies.
- 8 **Appendix B** contains background information on the community including demographic and social
9 information, land ownership, natural resources, climate and environmental information, and education and
10 outreach programs.
- 11 **Appendix C** presents additional mapping.
- 12 **Appendix D** provides summary information on the community and parcel risk-hazard assessments for
13 WUI communities.
- 14 **Appendix E** presents a sample form of the National Fire Protection Association (NFPA) Wildfire Fire Risk
15 and Hazard Severity Form 1144.
- 16 **Appendix F** details funding opportunities.
- 17 **Appendix G** contains additional resources for community members, including a homeowner wildfire
18 mitigation guide and a list of outside resources covering a variety of topics.
- 19 **Appendix H** presents information on public outreach and engagement with regard to this CWPP.
- 20 **Appendix I** houses project recommendations.
- 21 **Appendix J** outlines fuels treatment types and methods.
- 22 **Appendix K** contains information on post-fire response and recovery including response agencies, safety
23 information, and post-fire treatment methods.

24 WHAT IS THE GOAL OF A CWPP?

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

- 31 • **Collaboration:** Local and state government representatives, in consultation with federal agencies
32 or other interested groups, must collaboratively develop a CWPP.
- 33 • **Prioritized Fuel Reduction:** A CWPP must identify and prioritize areas for hazardous fuels
34 reduction and treatments and recommend the types and methods of treatment that will protect
35 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 40 ACRES 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 Core Team to prioritize treatments tailored specifically for the community to reduce fire risk. The development of the 2023 CWPP also provided for public involvement 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 40 Acres 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 110-111 of the Hazard Mitigation Plan (Inyo County and City of Bishop 2017).

WHO PARTICIPATED IN DEVELOPING THE PLAN?

The development of the 40 Acres CWPP was overseen by the 40 Acres Fire Safe Council. 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), Los Angeles Department of Water and Power (LADWP), Southern California Edison, and Inyo County Office of Emergency Services, along with other community or organization representatives, served as the 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 40 Acres and have contributed their expertise to this CWPP.

WHAT WAS THE PUBLIC INVOLVEMENT?

The Core Team engaged in public outreach using community surveys, community visits, community live demonstrations and walkthroughs, and information distributed through emails. The Core Team met virtually on July 26, 2022, in person in Bishop on October 27, 2022, and with community members in 40 Acres on October 29, 2022. Feedback, comments, and suggestions received from community members during community events (e.g., meetings and walkthroughs), the community survey, and project recommendations review were synthesized and utilized to craft project recommendations for the 40 Acres

1 CWPP. Therefore, the project recommendations are specifically tailored to address the concerns and
2 priorities of the community.

3 WHAT IS THE CURRENT WILDFIRE SITUATION?

4 The 40 Acres community is located in northwestern Inyo County in Round Valley. The community is on
5 the lower extent of an alluvial fan to the northeast of Pine Creek canyon at an elevation of 4,600 feet. This
6 geographic location is significant because of downslope winds off the Sierra Nevada immediately to the
7 west and very strong winds out of Pine Creek canyon. In a typical year, four to 10 windstorms occur with
8 gusts exceeding 50 mph. As a result of this topography and regional weather patterns, the community is
9 particularly at risk of wind-driven wildfires approaching from the west, as well as ignitions within the
10 community during windy weather.

11 40 Acres is surrounded by a sagebrush scrub plant community largely composed of big sagebrush
12 (*Artemisia tridentata*), antelope bitterbrush (*Purshia tridentata*), rubber rabbitbrush (*Ericameria nauseosus*),
13 and a wide variety of understory forbs and grasses (Howald 2000). More recent terminology would
14 describe the native vegetation as *Artemisia tridentata* Shrubland Alliance (California Native Plant Society
15 n.d.). Vegetation density (and therefore fuel continuity) is relatively sparse because of the arid climate (an
16 average of approximately 5–10 inches of annual precipitation). However, wind-driven embers can readily
17 propagate fire through the scrubland.

18 An artificial channel that delivers water from Pine Creek to the community supports dense riparian
19 vegetation. Live and dead fuel loads along this channel are quite high and could readily carry a fire from
20 upstream into 40 Acres (Switzer and Umek 2022). This canal supplies water to nearly 1 mile of small
21 irrigation channels serving all parcels within 40 Acres and supports relatively luxuriant vegetation
22 throughout the community. 40 Acres is known as the “big green square of dense vegetation” observed in
23 Round Valley when driving down the Sherwin Grade on Highway 395. The number of trees has been
24 estimated at nearly 1,000, some of which are up to 60 feet tall. The abundant vegetation contributes to
25 40 Acres often being described as an oasis, with portions called a jungle.

26 WHAT RECENT FIRES OCCURRED HERE?

27 The 40 Acres community and surrounding environment consist of diverse landscapes that produce a
28 complex wildfire setting due to variable topography, dead and downed vegetation, and an assortment of
29 vegetation types. Recent large, severe wildfires include the 2015 Round Fire, which burned about
30 7,000 acres and destroyed 40 homes in Paradise and Swall Meadows a few miles north of 40 Acres;
31 the 1983 Rovana Fire; and the 2018 Pleasant Fire.

32 WHAT IS THE PURPOSE OF THE RISK-HAZARD 33 ASSESSMENT?

34 The purpose of the risk assessment is to evaluate and provide information pertaining to the risk of
35 wildland fires within the WUI of the 40 Acres community. The Risk-Hazard Assessment is twofold and
36 combines a geographic information system (GIS) model of hazard based on fire behavior and fuels
37 modeling technology (Composite Risk-Hazard Assessment) and a Core Team–generated assessment of
38 on-the-ground community hazards and values at risk (VARs).

39 The risk assessment considers:

- 1 • Fire behavior modeling, which includes:
 - 2 ○ Fire history
 - 3 ○ Probability of fire occurring
 - 4 ○ Intensity of a fire if one occurs
- 5 • Exposure and susceptibility of the WUI and VARs to wildfire based on their locations

6 Due to its size, uniformity, and WUI location, the entirety of 40 Acres is rated as high risk.

7 HOW IS MY COMMUNITY RATED?

8 A community-level assessment and a parcel-level risk assessment, summarizing information on hazard
9 and risk for 40 Acres, are provided in this plan. A team from SWCA Environmental Consultants conducted
10 on-the-ground community-level and parcel-level risk assessment surveys throughout the Planning Area
11 between October 26 and 30, 2022, using the NFPA 1144 standard for assessing structure ignitability in
12 the WUI. Using this standard provided a consistent process for assessing wildland fire hazards around
13 existing structures to determine the potential for structure ignition from wildland fire ignitions.

14 The community-level and parcel-level assessments provide a total score of risk and hazard based on
15 various parameters observed during the surveys, and corresponding descriptive ratings of low, moderate,
16 high, or extreme are available in Appendix D.

17 WHAT ARE THE STRATEGIES TO ADDRESS WILDFIRE 18 HAZARDS?

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

22 Recommendations for hazardous fuels treatments include:

- 23 • Fuel reductions along the perimeter of the community, including the continuance of proposed
24 projects
- 25 • Vegetation treatments along ditches and creeks
- 26 • Fuel reduction efforts on private lands, including green waste disposal
- 27 • Interagency collaboration to facilitate project implantation
- 28 • Increasing community capacity to implement projects
- 29 • Increasing workforce (firefighting personnel) to carry out projects

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

32 Recommendations for public outreach/education and structural ignitability include:

- 33 • Developing and promoting wildfire education, including evacuation procedures
- 34 • Offering financial assistance for defensible space work to seniors and low-income individuals

- 1 • Improving defensible space and structural hardening
- 2 • Hosting community awareness events
- 3 • Involving second-home owners and absentee homeowners in wildfire education
- 4 (defensible space and structure hardening measures)
- 5 • Conducting community walkthroughs with fire response organizations
- 6 • Addressing combustible debris and rubbish on private property
- 7 • Developing a community pre-fire plan

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

11 Recommendations for improving fire response capabilities include:

- 12 • Creating additional ingress and egress points
- 13 • Emergency notification improvements
- 14 • Identification of evacuation routes and shelter-in place locations
- 15 • Maintenance of dirt roads and trails around the community
- 16 • Expanding coverage of Alert California live cameras

17 WHAT DOES POST-FIRE RESPONSE AND RECOVERY 18 INVOLVE?

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

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

33 HOW WILL THE PLAN BE IMPLEMENTED?

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

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

8 In addition, implementation of fuels reduction projects must be tailored to the specific project and will be
 9 unique to the location depending on available resources and regulations. In an effort to streamline project
 10 implementation, this CWPP has identified the pertinent land management/ownership agencies associated
 11 with each recommendation. On-the-ground implementation of the recommendations identified in this
 12 CWPP will require the use of the action plan (recommendation matrices in Chapter 4) as well as an
 13 assessment strategy for completing each project.

14 WHO WILL LEAD THE IMPLEMENTATION OF THIS CWPP?

15 Implementation of most projects identified in this CWPP will require the collaboration and cooperation of
 16 multiple individuals and entities such as community residents, private organizations (such as LADWP),
 17 fire safe councils, and local, state, and federal agencies. However, to ensure that projects move forward,
 18 the plan will be governed by the 40 Acres Fire Safe Council with support from Inyo County’s Wildfire
 19 Coordinator.

20 WHEN DOES THE CWPP NEED TO BE UPDATED?

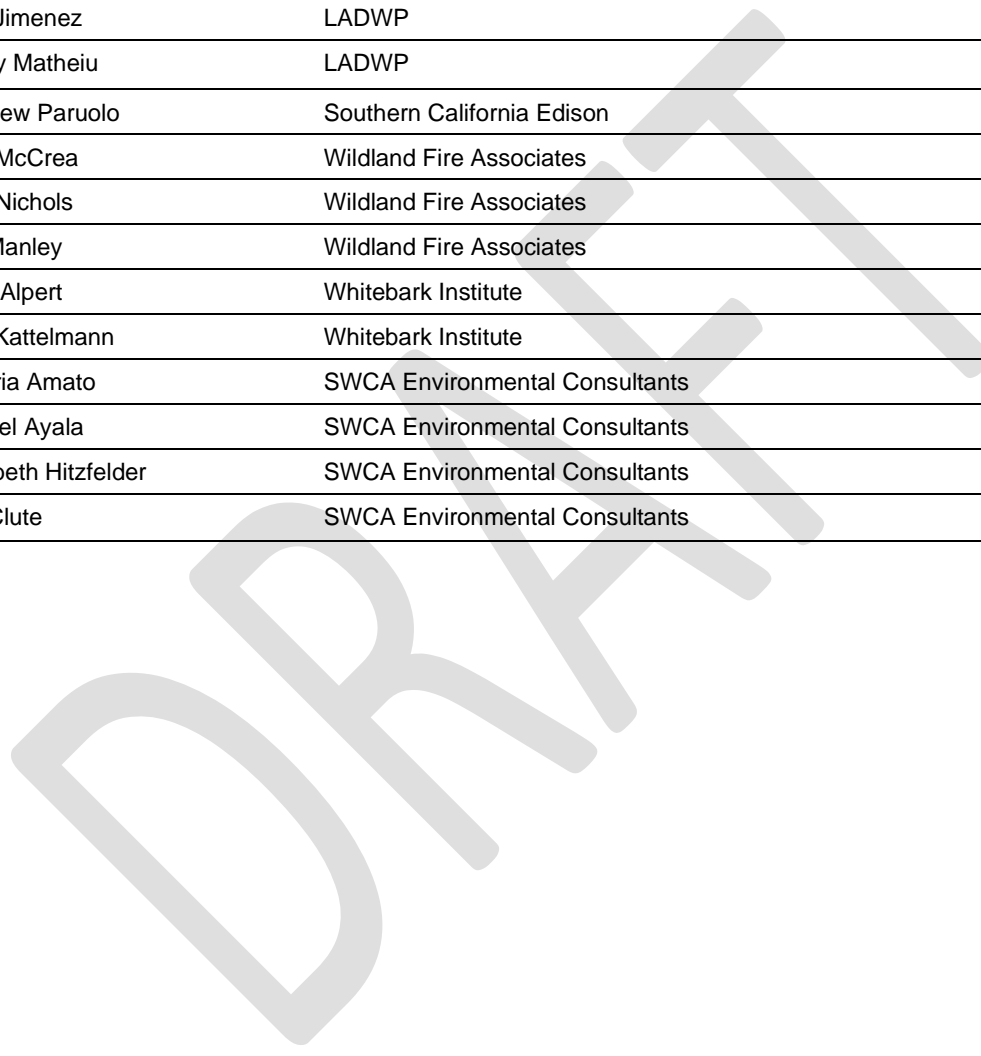
21 The CWPP should be treated as a living document to be updated annually or immediately following a
 22 significant fire event. The plan should continue to be revised to reflect changes, modification, or new
 23 information. These elements are essential to the success of mitigating wildfire risk throughout the
 24 community and will be critical in maintaining the ideas and priorities of the plan in the future. Chapter 5
 25 provides an evaluation framework that can help guide the CWPP update process.

26 CORE TEAM LIST

Name	Organization
Kay Ogden	40 Acres Fire Safe Council
Kristina Justice	Bishop Volunteer Fire Department
Lance Rosen	BLM
Heather Stone	BLM
David Haas	CAL FIRE
Carol Snow	CAL FIRE
Matt Edmiston	CAL FIRE
Steven Hynes	CAL FIRE
Kristen Pfeiler	Inyo County
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 Environmental Consultants
Montiel Ayala	SWCA Environmental Consultants
Elizabeth Hitzfelder	SWCA Environmental Consultants
Tim Clute	SWCA Environmental Consultants

1





CHAPTER 1 – INTRODUCTION

1

2 The United States is facing urgent forest and watershed health concerns. Indeed, the number of annual
3 wildfires throughout the United States has been slightly increasing (58,100 in 2018 and 50,000 in 2019
4 vs. 59,000 each in 2020 and 2021). Similarly, the number of acres burned has been on the rise
5 (Congressional Research Service [CRS] 2022). An average of 7 million acres is burned every year due to
6 wildfire, more than doubling the annual average of acres burned in the 1990s (CRS 2022). Communities
7 are seeing the most destructive wildfire seasons in history. In the last 5 years, the 2020 fire season had
8 the most acreage impacted in a single year at 10.1 million acres, and 2017 was the second highest with
9 10 million acres (CRS 2022). These statistics demonstrate that wildfires are becoming larger and
10 increasingly impactful.

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

17 The 2015 Round Fire illustrates the increasing risk of wildfire in the 40 Acres community. The Round Fire
18 burned about 7,000 acres and destroyed 40 homes in Paradise and Swall Meadows a few miles north of
19 40 Acres. This fire occurred in mid-winter during a severe wind event.

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

24 The development of the 40 Acres CWPP has included meaningful collaboration among many local
25 stakeholders including local, state, and federal officials, as well as other interested parties such as
26 non-governmental stakeholders and private citizens. The planning process involves looking at past fires
27 and treatments using the knowledge and expertise of the professional fire managers who work for the
28 various agencies and governing entities in the Planning Area. Using this information, the CWPP identifies

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

3 GOAL OF A COMMUNITY WILDFIRE PROTECTION 4 PLAN

5 The goal of a CWPP is to enable local communities to improve their wildfire-mitigation capacity, while
6 working with government agencies to identify high fire risk areas and prioritize areas for mitigation, fire
7 suppression, and emergency preparedness. Another goal of the CWPP is to enhance public awareness
8 by helping residents better understand the natural and human-caused risk of wildland fires that threaten
9 lives, safety, and the local economy. The minimum requirements for a CWPP, as stated in the Healthy
10 Forests Restoration Act of 2003 (HFRA), are the following (Society of American Foresters [SAF] 2004):

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

19 It is the intent of this 2023 40 Acres CWPP to provide a community-wide scale of wildfire risk and
20 protection needs, as well as bring together the responsible wildfire management and suppression entities
21 in the area to support planning and implementation of the necessary mitigation measures. Additional
22 information regarding the planning process is available in Appendix A.

23 ALIGNMENT WITH THE NATIONAL COHESIVE 24 STRATEGY

25 The 2023 CWPP has been aligned with the National Cohesive Wildland Fire Management Strategy
26 (Cohesive Strategy) and its Phase III Western Regional Action Plan by adhering to the nationwide goal
27 “to safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural
28 resources; and as a Nation, live with wildland fire” (Forests and Rangelands 2014:3).

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

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

36 For more information on the Cohesive Strategy, please visit: [https://www.forestsandrangelands.gov/
37 documents/strategy/strategy/CSPHaseIIINationalStrategyApr2014.pdf](https://www.forestsandrangelands.gov/documents/strategy/strategy/CSPHaseIIINationalStrategyApr2014.pdf)

- 1 Alignment with these Cohesive Strategy goals is described in more detail in Chapter 4, Mitigation
- 2 Strategies.
- 3 In addition to aligning with the Cohesive Strategy, the CWPP also incorporates information on post-fire
- 4 recovery, the significant hazards of a post-fire environment, and the risk that post-fire effects pose to
- 5 communities (Figure 1.1).



6
7 **Figure 1.1. The CWPP incorporates the three primary goals of the Cohesive Strategy and**
8 **post-fire recovery and serves as a holistic plan for fire prevention and resilience.**

9 **ALIGNMENT WITH PLANS AND AGREEMENTS**

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

CORE TEAM

The development of the 40 Acres CWPP was overseen by the 40 Acres Fire Safe Council. Representatives from various government agencies—along with members of fire departments and local communities—formed a Core Team and participated in decision-making activities that led to the development of the 40 Acres 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, and convened again on October 27, 2022, and lastly on February 15, 2023.

The Core Team list is provided in the Executive Summary.

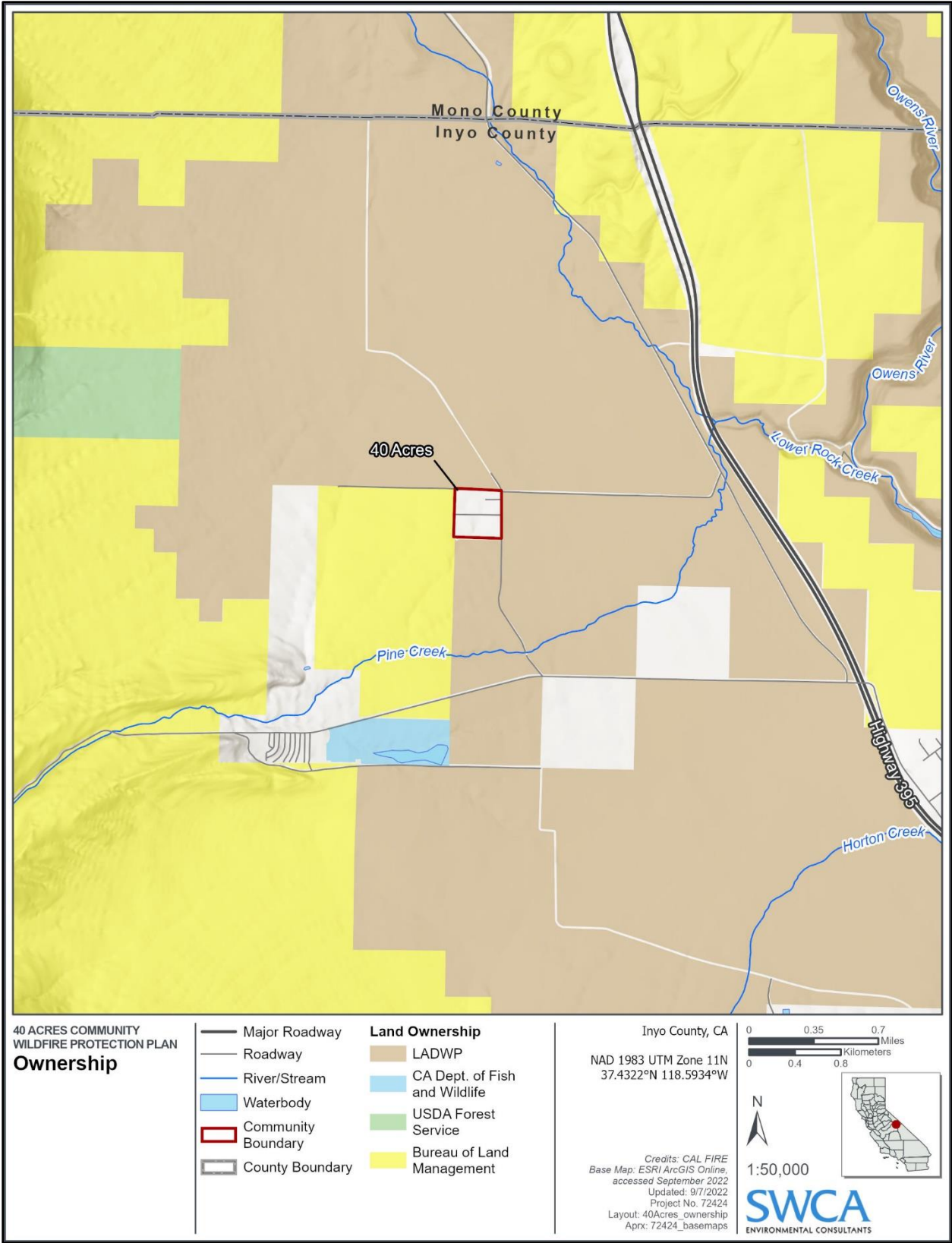
PLANNING AREA

The Planning Area includes the entire community of 40 Acres and the surrounding area (Refer to Figure ES.1 in the Executive Summary).

LAND OWNERSHIP

40 Acres itself is composed of privately owned land. Surrounding the community is land owned by the City of Los Angeles and federal land administered by the Bureau of Land Management (BLM) (Figure 1.2).

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



1
2

Figure 1.2. 40 Acres land ownership.

1 PUBLIC INVOLVEMENT

2 A key element in the CWPP process is the meaningful discussions it generates among community
3 members regarding their priorities for local fire protection and forest management (SAF 2004). The draft
4 CWPP was made available for public review from February 27, 2023, through March 10, 2023. In addition
5 to the CWPP report, public meetings and events were held to gather community input. These efforts are
6 described in detail in Appendix H.

7 Every effort was made to include a broad cross section of the community in the outreach process, and
8 different communication channels were used to engage as many members of the public as possible
9 (e.g., social media postings, email distributions, and in-person activities). All community members were
10 welcomed and encouraged to participate in in-person activities such as the community event, community
11 walkthrough, and home assessment demonstrations (home assessments were offered to all members).
12 Moreover, all community members were provided multiple opportunities to provide input, such as the
13 community survey, project recommendations review, and CWPP document review.

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

15 Public education and outreach programs are a common factor in virtually every agency and organization
16 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.

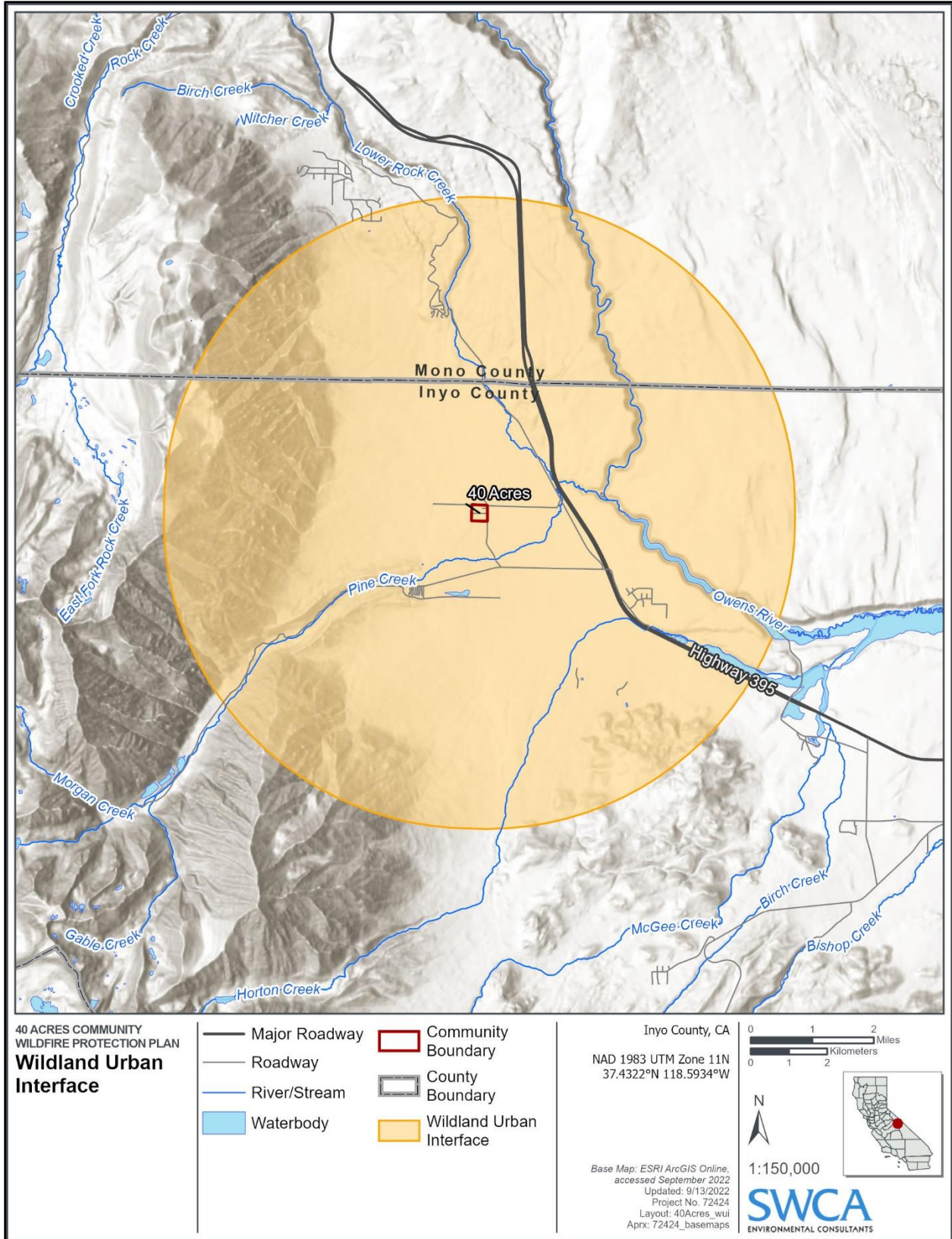
In addition, the WUI has an area of influence, or influence zone. This area is described with respect to wildland and urban fire; it is an area with a set of conditions that facilitate the opportunity for fire to burn from wildland fuels to the home and or structure ignition zone (National Wildfire Coordinating Group [NWCG] 2021a).

A CWPP offers the opportunity for collaboration of land managers to establish a definition and a boundary for the local WUI; better understand the unique resources, fuels, topography, and climatic and structural characteristics of the area; and 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, and the standard HFRA definition is as follows:

- 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.

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 40 Acres community (Figure 2.1).



1
2

Figure 2.1. 40 Acres WUI delineation.

1 The WUI creates an environment in which fire can move readily between structural and vegetative fuels,
2 increasing the potential for wildland fire ignitions and the corresponding potential loss of life and property.
3 Human encroachment upon wildland ecosystems within recent decades is increasing the extent of the
4 WUI throughout the country (Figures 2.2 and 2.3), which is having a significant influence on wildland fire
5 management practices. Combined with the collective effects of aggressive suppression policies, resource
6 management practices, land use patterns, climate change, and insect and disease infestations, the
7 expansion of the WUI into areas with high fire risk has created an urgent need to modify fire management
8 practices and policies and to understand and manage fire risk effectively in the WUI (Pyne 2001;
9 Stephens et al. 2005). Mitigation techniques for fuels and fire management can be strategically planned
10 and implemented in WUI areas, for example, with the development of defensible space around homes
11 and structures.

12 WUI LAND USE

13 Cities and counties are continuously challenged to accommodate both current and future residents in
14 need of safe and affordable housing. In California, approximately 180,000 homes need to be constructed
15 annually to meet demand (California Department of Housing and Community Development 2018). Over
16 the past few decades, jurisdictions across the state have approved many new housing units. These are
17 often placed within or near wildland areas, creating WUI conditions. Today, more than 46 million
18 residences in 70,000 communities are at risk for WUI fires (U.S. Fire Administration [USFA] 2021a).
19 When it comes to wildfire, this trend is of special concern since WUI conditions are linked with an
20 increased risk of loss of human life, property, natural resources, and economic assets. According to the
21 2018 Strategic Fire Plan for California, “since the turn of the century there has been a steep increase in
22 structures lost compared to the 1990s” (CAL FIRE 2018b).

23 Development in high or very high fire hazard areas is required to be constructed in a way that reduces the
24 risk from fire hazards and meets all appropriate county and state fire standards. The requirement includes
25 the use of fire-resistant materials produced to minimize fire susceptibility within high or very high fire
26 hazard areas according to the 2001 California Fire Code, Fire Safe Regulations, and other standards.
27 New development schemes must contain certain fire protection plans, codes, and actions for fire
28 engineering components for buildings and structures in very high fire hazard zones.

29 The entirety of 40 Acres is designated as a WUI. Under the Inyo County Building Code, all new
30 construction must comply with chapters of California Building Code applicable to Wildland-Urban
31 Interface Fire Areas. All properties shall be maintained in accordance with defensible space requirements
32 of the state (Inyo County Code: [https://library.qcode.us/lib/inyo_county_ca/pub/county_code/item/title_14-
33 chapter_14_08-14_08_140](https://library.qcode.us/lib/inyo_county_ca/pub/county_code/item/title_14-chapter_14_08-14_08_140)). In 40 Acres, only two undeveloped parcels remain. However, some existing
34 structures may be torn down and replaced with new construction in the future.

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

37 Additional Fire Code information is described in Appendix A.



1
2

Figure 2.2. Example of the WUI in 40 Acres (1 of 2).



3
4

Figure 2.3. Example of the WUI in 40 Acres (2 of 2).

1 Appendix D houses a description and a hazard rating accompanied by a WUI delineation map for the
2 community of 40 Acres. The WUI maps depict the entire WUI boundary for the community. The WUI
3 buffer is an area where fuel treatments should be prioritized to provide additional protection to the
4 community from potential wildfire spread. During Core Team meetings, stakeholders agreed that the WUI
5 buffer should be a 5-mile buffer on all sides of the community to account for the vegetation, topography,
6 and wind patterns.

7 In addition, Appendix D contains summaries, hazard ratings, and recommended mitigation actions for the
8 community-level and parcel-level assessments that were conducted in 40 Acres.

9 FUELS AND TOPOGRAPHY WITHIN THE WUI

10 Most of the fuels around 40 Acres are primarily composed of shrubland and grass-shrub fuels; however,
11 the community is bordered by riparian vegetation on its east, north, and west sides. In addition, a corridor
12 of riparian fuels travels into the community from the southwest, along the Pine Creek diversion. Shrubland
13 communities are primarily characterized by rabbitbrush and blackbrush vegetation and occur at low to
14 mid-elevations. Shrubland vegetation around 40 Acres is intermixed with sparse grasses and does not
15 typically occur as a homogeneous stand.

16 Forested communities exist primarily in the higher elevations of the Sierra Nevada to the west of
17 40 Acres. Typically, forested communities are dominated by pinyon-juniper woodlands at the lower
18 elevations; transition to red fir forests, Jeffrey pine forests, and mixed-conifer forests at mid- to higher
19 elevations; and to white pine (whitebark pine, foxtail pine, limber pine) forests in the subalpine zone
20 (USFS 2018a).

21 Map C.1 in Appendix C shows fuels within and around 40 Acres.

22 FIRE REGIMES

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

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

27 The region is home to the Sierra Nevada biological province and converges with the Great Basin and the
28 Mojave Desert biological provinces. The convergence of these biological provinces creates an
29 environment conducive to a wide variety of vegetation ecosystems such as sagebrush shrubland, pinyon-
30 juniper woodland, montane mixed conifer, and dry mixed conifer (USFS 2018a). However, the most
31 widespread and common plant communities in and around 40 Acres is sagebrush shrubland mixed with
32 grasses and riparian vegetation. The fire regimes of these communities are summarized below.

33 SHRUBLAND AND GRASSES

34 Shrubland communities are widely distributed throughout the Great Basin and exist across the Eastern
35 Sierra in arid environments. Recent terminology would describe the native vegetation as *Artemisia*
36 *tridentata* Shrubland Alliance (California Native Plant Society n.d.). These communities are dominated by
37 drought-resistant shrubs, particularly sagebrush vegetation. Sagebrush in the Eastern Sierra comprises
38 all subspecies of big sagebrush, low sagebrush, bitterbrush, and black sagebrush (USFS 2018a). The

1 community is also distinguished by an understory of perennial grasses and forbs within the open spaces
2 between shrubs. The composition of sagebrush shrubland communities is highly varied at both local and
3 regional scales and is oftentimes intermixed with pinyon-juniper vegetation. Sagebrush shrubland is a
4 disconnected fuel bed that interrupts the occurrence of many large wildfires. Natural fire frequency in
5 these communities range from 32 to 70 years (Kitchen et al. 2013). Historic fires were usually small, high-
6 intensity surface fires that maintained the composition of the community. However, anthropogenic
7 disturbances have altered this regime—the modern fire regime is a short fire-return interval of large,
8 intense fires. Disturbances such as livestock grazing prevent the propagation of native bunchgrasses and
9 allow for invasive species (e.g., cheatgrass) to invade and proliferate. Cheatgrass, a highly combustible
10 fuel, has further contributed to changing the fire regime. Cheatgrass produces an abundance of light,
11 flashy, and continuous fuel, which creates the perfect conditions for frequent fires (USFS 2014).
12 Cheatgrass exists throughout California and is the primary annual grass on sagebrush rangelands in the
13 Owens Valley (University of California, Agriculture and Natural Resources [UCANR] 2019). The adjacent
14 Inyo National Forest has also recorded invasions by cheatgrass (USFS 2018a).

15 RIPARIAN VEGETATION

16 Lowland riparian environments in many regions of California have been altered extensively by human
17 caused disturbances. As a result of these modifications, species composition and spatial dimensions of
18 riparian plant communities have changed. In most cases, native riparian vegetation has been eliminated
19 completely. Studies suggest that fire frequency and severity are increasing in many riparian environments
20 where nonnative plants constitute a significant part of the plant community (Webb et al. 2019). Native
21 riparian trees such as willows and cottonwoods typically do not recover well from high-intensity crown
22 fires; contrarily, invasives such as salt cedar, giant reed, and Russian olive recover quickly from even the
23 highest-intensity fires (UCANR 2009). Nonnative vegetation alters fuel properties such as flammability
24 and continuity, and fuel loading, which leads to increased fire risk. Fires in these riparian areas are
25 typically extensive and severe, and fire spreads easily from the surface into the canopies of the tallest
26 native trees (UCANR 2009). In the Owens Valley, salt cedar has been expanding its range since the mid
27 twentieth century (Inyo County Water Department 2023).

28 CLIMATE AND WEATHER PATTERNS

29 40 Acres has an arid climate typical of Owens Valley (Powell and Klieforth 2000). The geographic location
30 immediately east of the Sierra Nevada results in minimal precipitation because of the strongly declining
31 precipitation gradient in the lee of the mountains (“rain shadow effect”), occasional strong downslope
32 winds, and warm to hot temperatures except during winter. Relative humidity is rarely above 20% and
33 often less than 10%, during the fire season.

34 July is typically the hottest month of the year in the area, with average maximum July temperatures of
35 approximately 98°F at the Bishop Airport weather station (Figure 2.4). December and January are usually
36 the coldest months, with average minimum temperatures of approximately 22°F at the Bishop Airport
37 weather station (Western Regional Climate Center 2022).

38 40 Acres receives relatively little precipitation because of its location in the rain shadow of the Sierra
39 Nevada (Table 2.1). Annual precipitation totals have ranged from 1.3 inches in 2013 to 17 inches in 1969,
40 with an average of 5.3 inches at the Bishop Airport weather station. The months of December, January,
41 February, and March receive approximately 65% of the annual precipitation. The summer months of July,

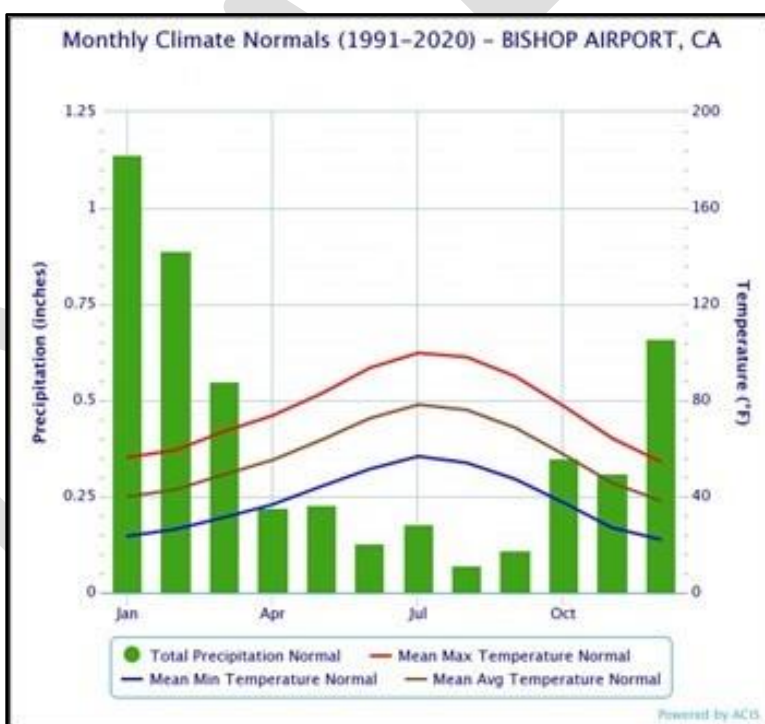
1 August, and September are hot and dry with infrequent precipitation from thunderstorms and receive only
 2 approximately 7% of the annual precipitation.

3 **Table 2.1. Climate Summaries for Weather Stations near 40 Acres**

Station	Period of Record	Total Mean Annual Precipitation (Inches)	Mean Annual Temperature (°F)		
			Max	Min	Mean Annual
Bishop WSO	1895–2016	5.3	74.5	37.6	65
Union Carbide	1957–1969	10.4	54.1	33.0	---

4 Source: Western Regional Climate Center (2022)

5 The geographic location of 40 Acres is significant because of downslope winds off the Sierra Nevada
 6 immediately to the west and very strong winds out of Pine Creek canyon. In a typical year, four to
 7 10 windstorms occur with gusts exceeding 50 mph. A private weather station within the community
 8 measured a wind gust of 125 mph in April 2007 when 22 utility poles were brought down by the strong
 9 winds. As a result of the topography and regional weather patterns, the community is particularly at risk of
 10 wind-driven wildfires approaching from the west, as well as ignitions within the community during windy
 11 weather.



12 **Figure 2.4. Monthly climate normal for the Bishop Airport**
 13 **weather station for 1991 through 2020.**
 14

15 FIRE HISTORY

16 Fire is a natural part of California’s diverse landscapes and is essential to many ecosystems across the
 17 state. Almost all of California’s diverse ecosystems are fire-dependent or fire-adapted. For centuries,

1 many California Native American tribes recognized this interdependence between fire and the ecosystem
2 and used prescribed burning to maintain and restore ecosystem health. However, in the 1800s, a shift in
3 management actions—settlers began enforcing strict fire suppression regimes—led to issues such as
4 dense stand conditions and increased vulnerability to fire. Wildland fire suppression regimes, in
5 conjunction with other management actions such as human expansion into wildlands and climate change,
6 have resulted in an imbalance between wildfire and ecosystem interactions (California Department of Fish
7 and Wildlife [CDFW] 2021).

8 PAST FIRE MANAGEMENT POLICIES AND LAND 9 MANAGEMENT ACTIONS

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

15 RECENT FIRE OCCURRENCE

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

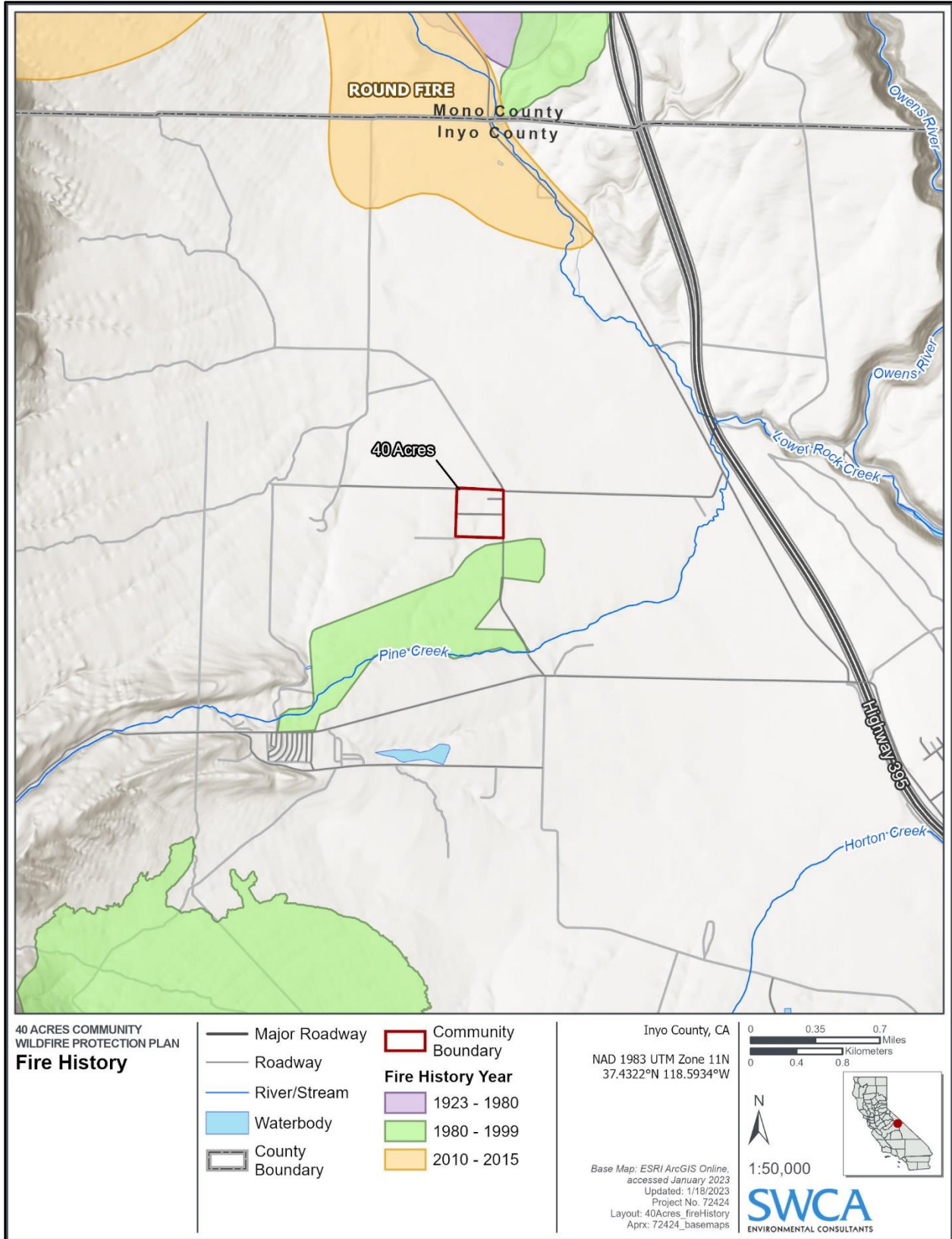
23 The fire history dates differ between the charts and the map because the charts contain fire history for 40
24 Acres and a surrounding 20-mile buffer. The map shows fire history only for the area that is displayed
25 (i.e., less than the 20-mile buffer). It should be noted that the 20-mile buffer captures some of the fires in
26 the western Sierra, including large fires such as the 2020 Creek Fire. These fires strongly influence the
27 analysis below.

28 An analysis of 40 Acre's wildland fire history (1923–2021) shows historic fires occurring to the north and
29 south of the community, within and around the valley floor and foothills (Figure 2.5). Historically, fire
30 events have been relatively constant, with most decades (1963–2003) experiencing six events (Figure
31 2.6). However, there has been a steady increase of fire events, human ignitions, and total acreage
32 burned per decade over the last 20 years (Figures 2.6, 2.7, 2.8, and 2.10). In fact, 94.5% (393,440 acres)
33 of all acres burned since 1934 have burned in the last two decades (2003–2021) (see Figure 2.8). Many
34 of the fires in the region have unknown causes (which are probably human caused), and human ignitions
35 have increased substantially in the last two decades.

36 Most fires occurred within the period of July to September, which is when high temperatures and hot, dry
37 winds are most frequent (see Figure 2.9) and when live fuel moistures are low and grasses cured out.
38 This trend coincides with California's fire season, which usually occurs between July and November. The
39 region also experiences a fire season in the winter and spring, with a considerable number of fires
40 occurring within the period of February to April (see Figure 2.9). In addition, fire seasons are increasing in

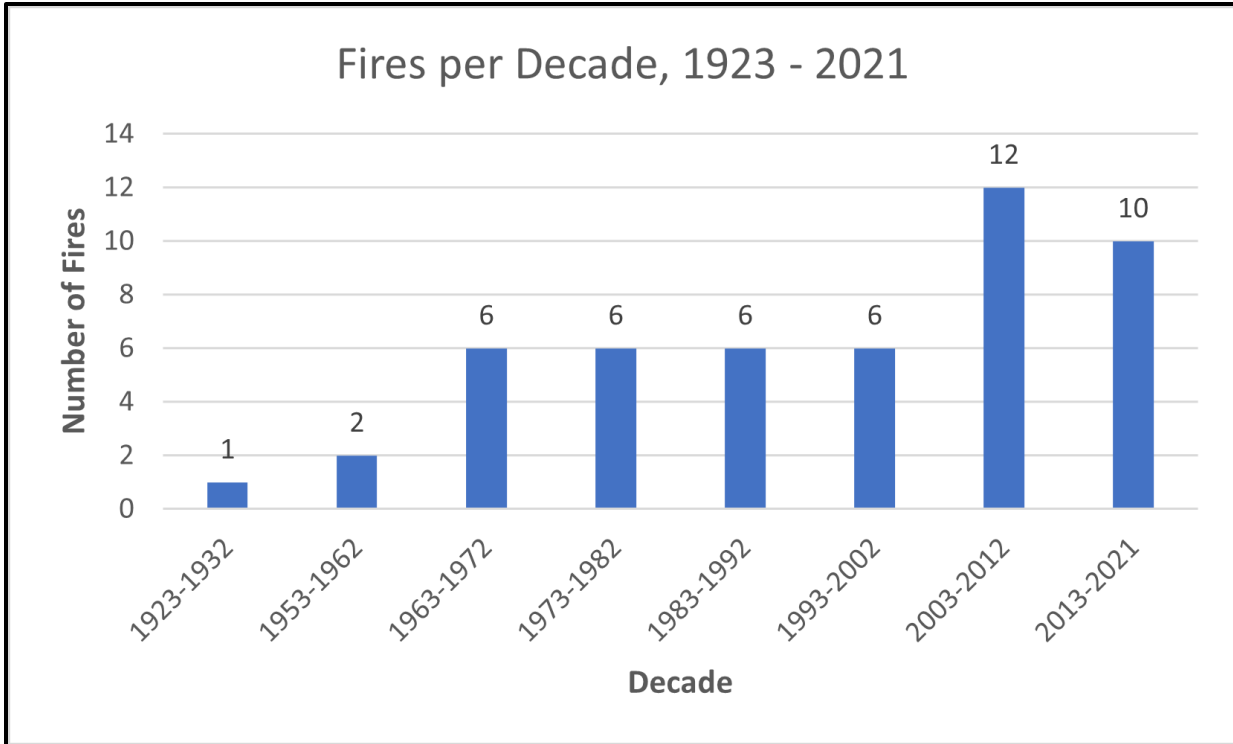
- 1 length. Climate change acts as a key driver of increased fire season duration due to warmer spring and
- 2 summer temperatures, decreased snowpack, and earlier spring snow melt (CAL FIRE 2021a).

DRAFT

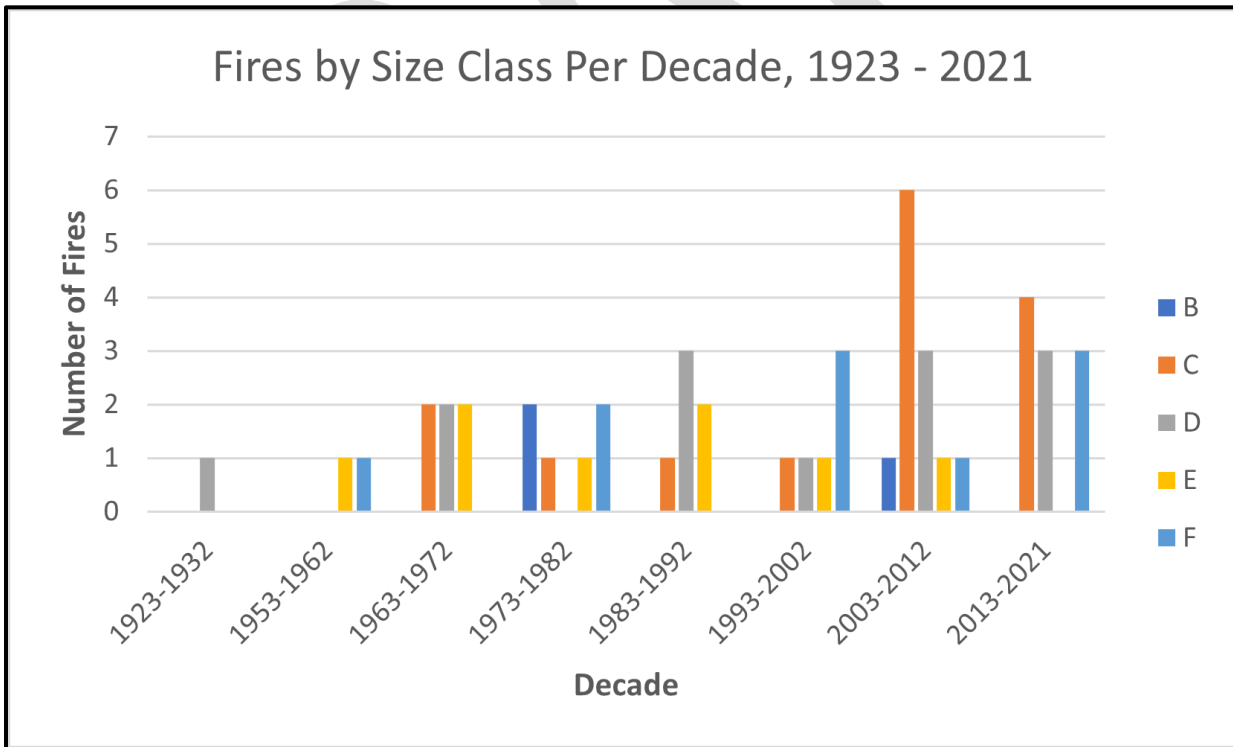


1
2

Figure 2.5. Historic fire perimeters for 40 Acres from 1923 through 2021.

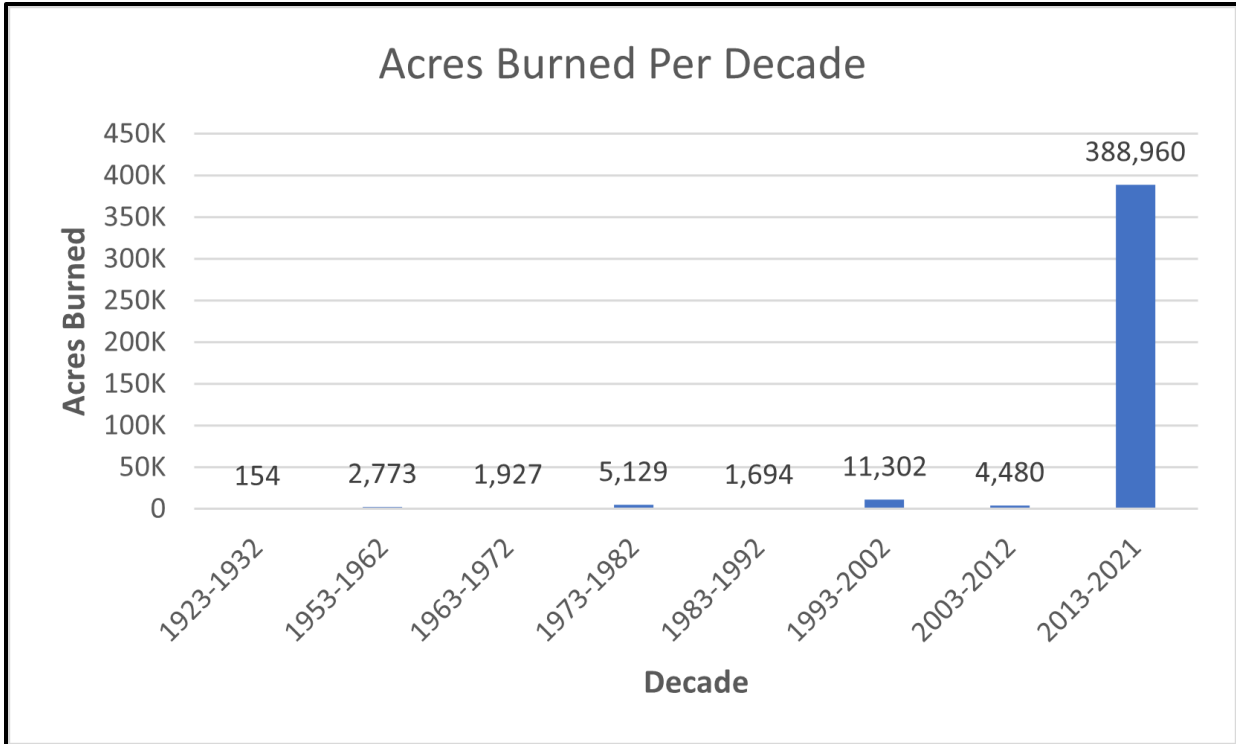


1
2 **Figure 2.6. Decadal wildfire frequency in 40 Acres (and 20-mile buffer) based on fire history data**
3 **from 1923 through 2021.**

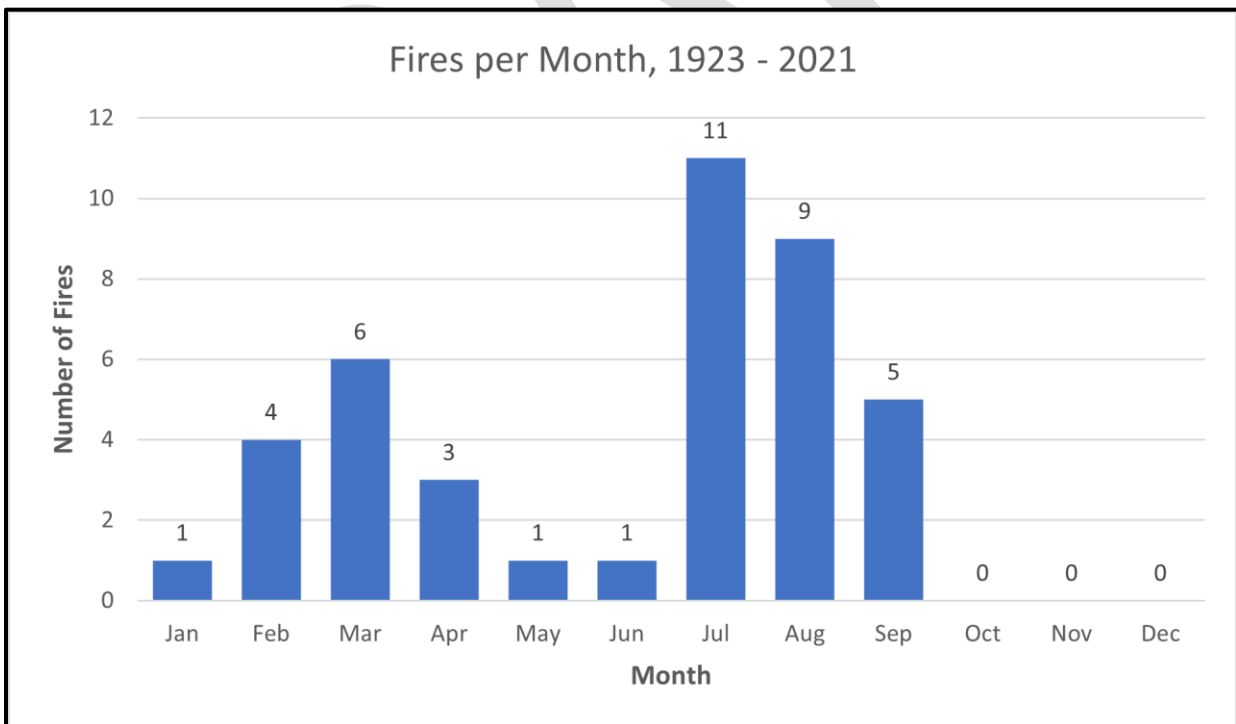


4
5 **Figure 2.7. Fire size statistics per decade for 40 Acres (and 20-mile buffer) based on fire history**
6 **data from 1923 through 2021.**

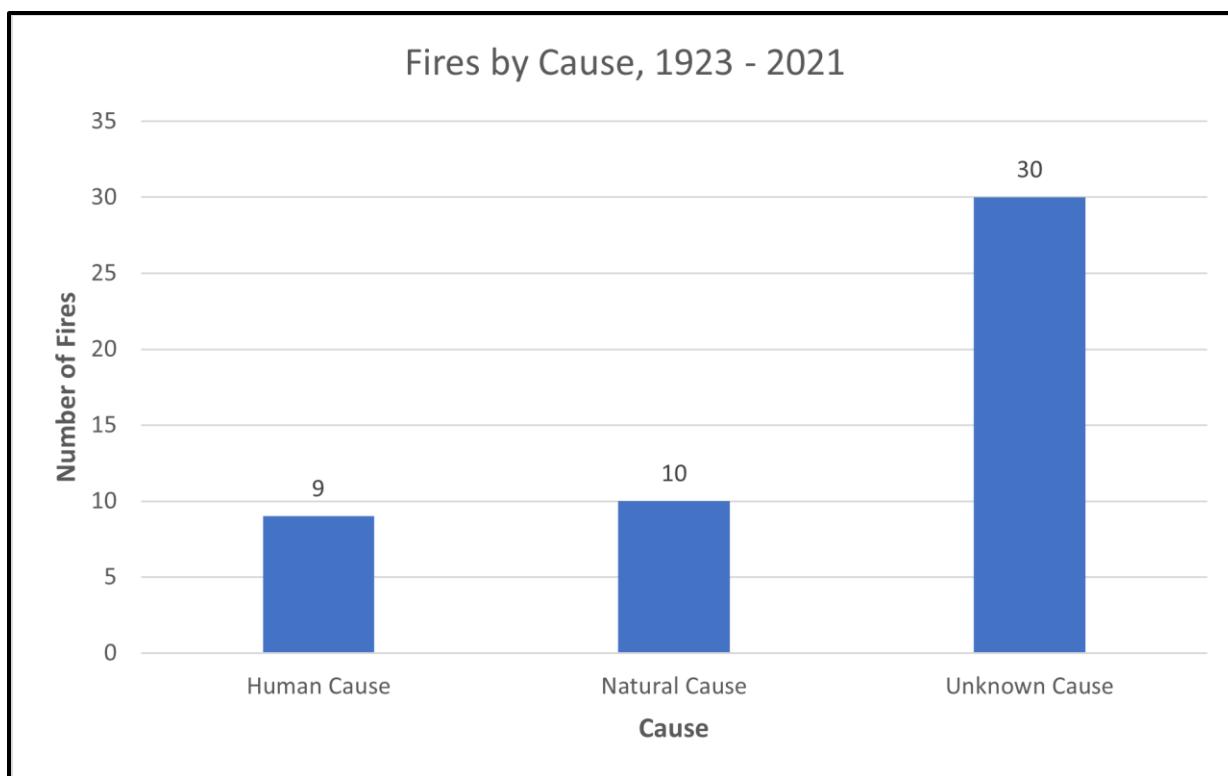
7 Size Class: A = 0.25 acre or less; B = greater than 0.25 to 10 acres; C = 10 to 100 acres; D = 100 to 300 acres; E = 300 to
8 1,000 acres; F = 1,000+ acres.



1
2 **Figure 2.8. Acres burned per decade for 40 Acres (and 20-mile buffer) based on fire history data**
3 **from 1934 through 2021.**



4
5 **Figure 2.9. Monthly fire frequency in 40 Acres (and 20-mile buffer) based on data from 1934**
6 **through 2021.**



1
2 **Figure 2.10. Fire causes for 40 Acres (and 20-mile buffer) from 1934 through 2021.**

3 The Round Fire that caused great damage in Swall Meadows and Paradise is the fire that most residents
4 of 40 Acres vividly remember. Besides destroying 40 homes within the neighboring communities to the
5 north, this 7,000-acre fire was starkly visible from 40 Acres. The Round Fire apparently ignited from
6 sparks from wind-tossed electrical lines less than 2 miles from 40 Acres on February 6, 2015. Strong
7 winds from the south moved the fire away from 40 Acres. Little imagination is required to think about a
8 different outcome if the wind direction had been the opposite. In addition, the vegetation density and fuel
9 loads within the area burned by the Round Fire were minimal compared with those of 40 Acres. Other
10 recent fires in the general vicinity of 40 Acres include the Rock Creek Fire of August 2016, which burned
11 120 acres along Rock Creek, just northeast of the Round Fire area; and the Pleasant Fire of February
12 2018, which burned more than 2,000 acres a few miles east of 40 Acres. Older (i.e., before 2010) fires
13 include the Rovana Fire of June 1983, which started less than 2 miles to the southwest and burned
14 317 acres as the fire approached 40 Acres driven by 30-mph winds. Two homes within 40 Acres burned
15 during the Rovana Fire, perhaps ignited by windblown embers.

16 FUTURE CHALLENGES

17 Frequent drought, suppression-based forest management practices, and climate change have interacted
18 to increase forest vulnerability. Removing natural fire from a fire-dependent ecosystem, drought, insects,
19 and diseases have resulted in increased fuel build-up and alterations to vegetation composition. These
20 forest changes can increase the risk of uncharacteristically large high-severity fires (CDFW 2021). In the
21 past few years, fires have grown to record sizes and are burning earlier, longer, hotter, and more
22 intensely than they have in the past (Westerling et al. 2006; Westerling 2016).

23 According to Westerling et al. (2006), a study of large (>1,000 acres) wildfires throughout the western
24 United States for the period of 1970 to 2003 saw a pronounced increase in fire frequency since the

1 mid-1980s (1987–2003 fires were four times more frequent than the 1970–1986 average). An update to
2 Westerling et al.'s 2006 work found that the frequency of large wildfires has continued to increase with
3 each decade since 1970 (Westerling 2016). Indeed, recent studies suggest that this trend will continue.
4 Iglesias et al. (2022) found that average fire occurrences in regions of the United States are up to four
5 times larger in size, more extensive, and triple the frequency during the last two decades.

6 Within the last 10 years, a record number of acres have burned, and numbers have surged since the turn
7 of the century (National Interagency Fire Center [NIFC] 2021a). In 2021, 58,985 fires were reported
8 nationwide, burning well over 7 million acres (NIFC 2021a). Of these, over 2.5 million acres were burned
9 in California, which represents more than a third of all acreage burned nationwide (CAL FIRE 2022b).
10 With increased fires comes increased suppression costs; 2021 beat all previous records, with federal
11 firefighting costs hitting over \$4 billion (NIFC 2021b). Indeed, the 2015 Round Fire burned more than
12 7,000 acres and 40 homes about 2 miles north of 40 Acres.

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

14 FIRE RESPONSE CAPABILITIES

15 Planning Decision and Support

16 Wildfires have continued to grow in size and severity over the last decade, requiring fire managers to
17 institute more robust pre-fire planning as well as adapt and improve decision-making tools in order to
18 reduce risk to fire responders and the public and assess impacts on ecological processes.

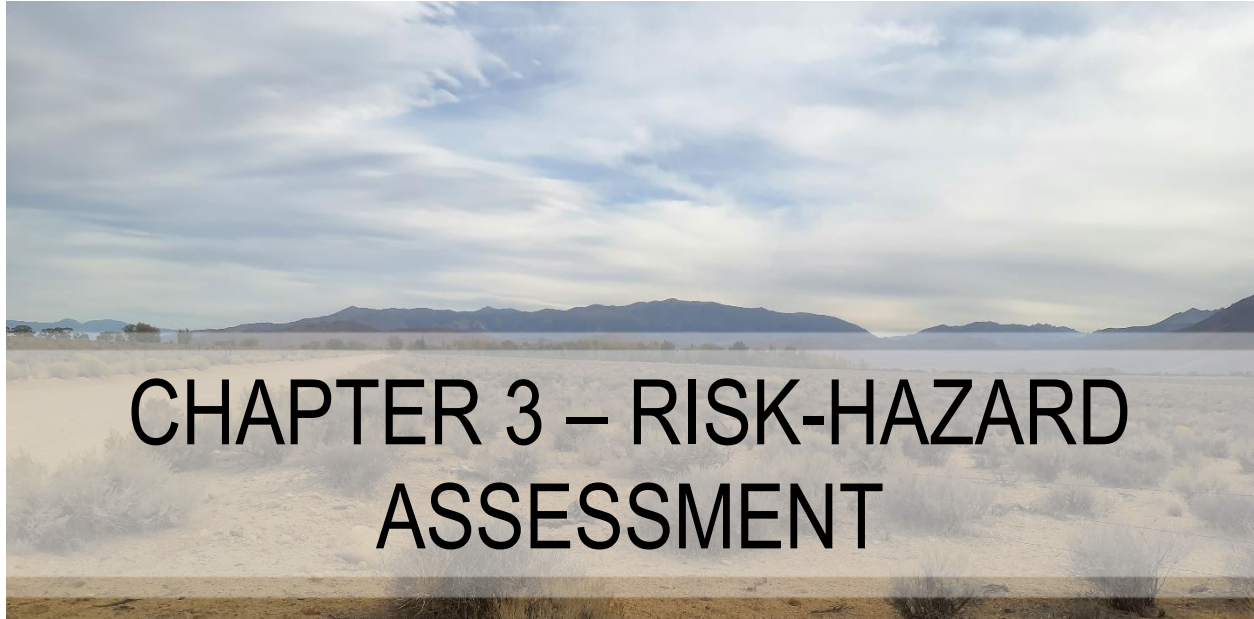
19 A primary decision tool utilized by fire managers across all agencies is the Wildland Fire Decision Support
20 System (WFDSS), a system that assists fire managers and analysts in making strategic and tactical
21 decisions for fire incidents (WFDSS 2021). WFDSS combines desktop applications for fire modeling into
22 one web-based system. It provides a risk-informed decision process and documentation system for all
23 wildland fires, and it also introduces economic principles into the fire decision process to improve
24 efficiency while also ensuring safe and effective wildfire response.

25 Fire Resources

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

33 Within California, fire response is broken down into three areas: Local, State, and Federal Responsibility
34 Areas (Appendix C, Map C.10). Local Responsibility Area (LRA) is a legal term defining the area where
35 the local government has financial responsibility for the prevention and suppression of wildfire. State
36 Responsibility Area (SRA) defines where the state government is responsible for wildfire response,
37 and Federal Responsibility Area (FRA) defines where the federal government is responsible.

38 Additional information regarding local, state, and federal fire response capabilities for 40 Acres can be
39 found in Appendix B.



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 40 Acres. 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 (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 can 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

1 *such has inherent biases, missing data, and other shortcomings, though every effort has been made to*
2 *include the best available data and use the most robust scientific processes. Also note that just because*
3 *an area is shown as high or low risk does not mean that that area will be burned or not burned in a*
4 *wildfire—a low risk area can still be affected by wildfire if the conditions are right. This risk assessment is*
5 *also not intended for use during active wildfire events, but rather only as a tool for pre-fire planning. It is*
6 *not recommended that this risk assessment be used for any other purpose than what is stated here.*

7 FIELD-BASED COMMUNITY HAZARD ASSESSMENTS

8 Community Hazard Assessments were conducted using the NFPA Wildland Fire Risk and Hazard
9 Severity Form 1144 (see Appendix E). This form is based on the NFPA Standard for Reducing Structure
10 Ignition Hazards from Wildland Fire 2013 Edition. The NFPA standard focuses on individual structure
11 hazards and requires a spatial approach to assessing and mitigating wildfire hazards around existing
12 structures. It also includes ignition-resistant requirements for new construction and is used by planners
13 and developers in areas that are threatened by wildfire and is commonly applied in the development of
14 Firewise Communities (for more information, see www.firewise.org).

15 The purpose of the Community Hazard Assessment and subsequent ratings is to identify fire hazards and
16 risks and prioritize areas requiring mitigation and more detailed planning. These assessments should not
17 be seen as tactical pre-suppression or triage plans. The Community Hazard Assessment helps to drive
18 the recommendations for mitigation of structural ignitability, community preparedness, and public
19 education. The assessment also helps to prioritize areas for fuels treatment based on the hazard rating.
20 Each area was rated based on conditions within the community and immediately surrounding structures,
21 including access, adjacent vegetation (fuels), defensible space, adjacent topography, roof and building
22 characteristics, available fire protection, and placement of utilities. Where a range of conditions was less
23 easily parsed out, a range of values was assigned on a single assessment form. Each score was given a
24 corresponding adjective rating of low, moderate, high, or extreme.

25 A Community Hazard Assessment for 40 Acres was conducted in October 2022. The community at risk
26 (CAR) hazard rating from the Community Hazard Assessment is provided in Table 3.1. This table also
27 includes a summary of the positive and negative attributes of the community as they relate to wildfire risk.
28 The full CAR description is provided in Appendix D.

29 In addition, a parcel-level hazard assessment was conducted for 40 Acres. In general, parcels exhibited
30 limited defensible space, combustible construction materials (siding, decks, fences, and roofs), exposure
31 to adjacent fuels, and improper placement of woodpiles and propane tanks. Appendix D contains the
32 parcel-level summaries for the properties that SWCA was given permission to assess.

33

34

1 **Table 3.1. Communities at Risk Ratings with Community Hazard Assessment Summary**

Community	Risk Rating	Fire Station	Positives	Negatives
40 Acres	87 (High)	<ul style="list-style-type: none"> CAL FIRE Bishop Forestry Fire Station 	<ul style="list-style-type: none"> Two or more roads in and out of community (Birchim Ln and Round Valley Rd) Surfaced roads with < 5% grade Street signs present and reflective Relatively flat terrain around community Good water source (3 water tanks and ditches within community) 	<ul style="list-style-type: none"> Narrow roads < 20 feet in width Limited defensible space for most structures Limited turnarounds Little separation of adjacent structures Combustible house siding Predominantly combustible roofing material Predominantly combustible deck and fence material Some properties with combustible debris or rubbish Community is between 10 to 15 minutes from fire station (Round Valley Rd currently closed) Gas and electric utilities are aboveground Community is exposed to grass-shrub fuels on all sides Significant dead and dying fuels within community and adjacent areas/ditches Southwest corner of the community has a ditch lined with heavy fuels that is aligned with wind and topography Roads with no outlet (Ocean View, Walford)

2

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 were subsequently used as inputs 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 (HVRA) (Map C.8 in Appendix C) 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 and 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.

1 FIRE BEHAVIOR MODELS

2 LANDFIRE

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

7 FARSITE

8 FARSITE is a computer model based on Rothermel's spread equations (Rothermel 1983) and Huygen's
9 principle of wave propagation (Anderson et al. 1981); the model also incorporates crown fire models.
10 FARSITE uses spatial data on fuels, canopy cover, crown bulk density, canopy base height, canopy
11 height, aspect, slope, elevation, wind, and weather to model fire behavior across a landscape. FARSITE
12 is a spatial and temporal fire behavior model. FARSITE is used to generate fuel moisture and landscape
13 files as inputs for FlamMap. Information on fire behavior models can be obtained from <http://www.fire.org>.

14 FlamMap

15 Like FARSITE, FlamMap uses a spatial component for its inputs but only provides fire behavior
16 predictions for a single set of weather inputs. In essence, FlamMap gives fire behavior predictions across
17 a landscape for a snapshot of time; however, FlamMap does not predict fire spread across the landscape.
18 FlamMap has been used for the CWPP to predict fire behavior across the landscape under extreme
19 (97% worst case) weather scenarios. For this CWPP assessment, the model was run within the IFTDSS
20 modeling platform (IFTDSS 2022).

21 FIRE BEHAVIOR MODEL INPUTS

22 Fuels

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

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

- | | | | |
|----|---------------------|----|--------------------------|
| 27 | • (NB) Non-burnable | 32 | • (TU) Timber-Understory |
| 28 | • (GR) Grass | 33 | • (TL) Timber Litter |
| 29 | • (GS) Grass-Shrub | 34 | • (SB) Slash-Blowdown |
| 30 | • (SH) Shrub | | |

31
35 Table 3.2 provides a description of each fuel type.

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

1 Field surveys revealed that some fuels were incorrectly classified in the fuel model. Following on-the-
 2 ground verification of fuels around 40 Acres and Core Team input, the fuel model was calibrated to reflect
 3 the type of fuels observed in the vicinity. In detail, fuel models were calibrated to align with expected fire
 4 behavior in the region; for instance, if fire was expected to travel at 50 chains per hour and have a flame
 5 length of 8+ feet, we assigned a fuel model with those characteristics that was also in accordance with
 6 our field observations.

7 **Table 3.2. Fuel Model Classification for the Planning Area**

1.	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).
2.	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).
3.	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).
4.	Dead and downed woody fuel (litter) beneath a forest canopy (Timber Litter)
i.	TL2: Low load, compact. Spread rate very low (0–2 chains/hour); flame length very low (0–1 foot).
ii.	TL3: Moderate load. Spread rate very slow (0–2 chains/hour); flame length low (1–4 feet); fine fuel load (0.5 ton/acre).
iii.	TL5: High load conifer litter. Spread rate slow (2–5 chains/hour); flame length low (1–4 feet).
iv.	TL6: Moderate load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet).
5.	Insufficient wildland fuel to carry wildland fire under any condition (Non-burnable)
i.	NB1: Urban or suburban development; insufficient wildland fuel to carry wildland fire.
ii.	NB8: Open water.
iii.	NB9: Bare ground.

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

1 Topography

2 Topography is important in determining fire behavior. Steepness of slope, aspect (direction the slope
3 faces), elevation, and landscape features can all affect fuels, local weather (by channeling winds and
4 affecting local temperatures), and rate of spread of wildfire.

5 Weather

6 Of the three fire behavior components, weather is the most likely to fluctuate, especially on a daily basis.
7 Accurately predicting fire weather remains a challenge for forecasters. As downslope winds from the
8 Sierra Nevada and rising temperatures dry fuels in the spring and summer, conditions can deteriorate
9 rapidly, creating an environment that is susceptible to wildland fire. It should be noted that the region also
10 experiences a fire season in the winter. Fine fuels (grass and leaf litter) can cure rapidly, making them
11 highly flammable in as little as 1 hour following changes in relative humidity. Low live fuel moisture of
12 shrubs and trees can significantly contribute to fire behavior in the form of crowning and torching. With
13 high wind, grass and shrub fires can spread rapidly, engulfing communities, often with limited warning for
14 evacuation. The creation of defensible space is of vital importance in protecting communities from this
15 type of fire. For instance, a carefully constructed fuel break placed in an appropriate location could protect
16 homes or possibly an entire community from fire. This type of defensible space can also provide safer
17 conditions for firefighters, improving their ability to suppress fires and protect life and property.

18 One of the critical inputs for FlamMap is the fuel moisture files. The initial run of the Risk-Hazard
19 Assessment utilized the IFTDSS Auto 97th modeling parameters, which integrate historic fire weather
20 data from nearby RAW stations. SWCA noted that some of the fire behavior outputs did not reflect the
21 intensity and severity of fire behavior that has been observed during recent fires. Therefore, the
22 Risk-Hazard Assessment was revised using more extreme live and dead fuel moistures to better align
23 with extreme fire behavior conditions.

24 FIRE BEHAVIOR MODEL OUTPUTS

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

26 Flame Length

27 Map C.2 in Appendix C illustrates the flame length classifications for the Planning Area. Flame lengths
28 are determined by modeling in the FlamMap system using the following inputs: fuels, weather, and
29 topography. Flame length is a particularly important component of the Risk-Hazard Assessment because
30 it relates to potential crown fire (particularly important in timber areas) and suppression tactics. Direct
31 attack by hand lines is usually limited to flame lengths less than 4 feet. In excess of 4 feet, indirect
32 suppression is the dominant tactic. Suppression using engines and heavy equipment will move from
33 direct to indirect with flame lengths in excess of 8 feet.

34 Flame lengths across the Planning Area range from 0 to more than 25 feet. The highest flame lengths are
35 associated with the timber fuels and heavy riparian vegetation found along ditches and creeks.

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

1 Fireline Intensity

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

7 Fireline intensity across the Planning Area ranges from 0 to more than 6,175 Btu/ft/sec.

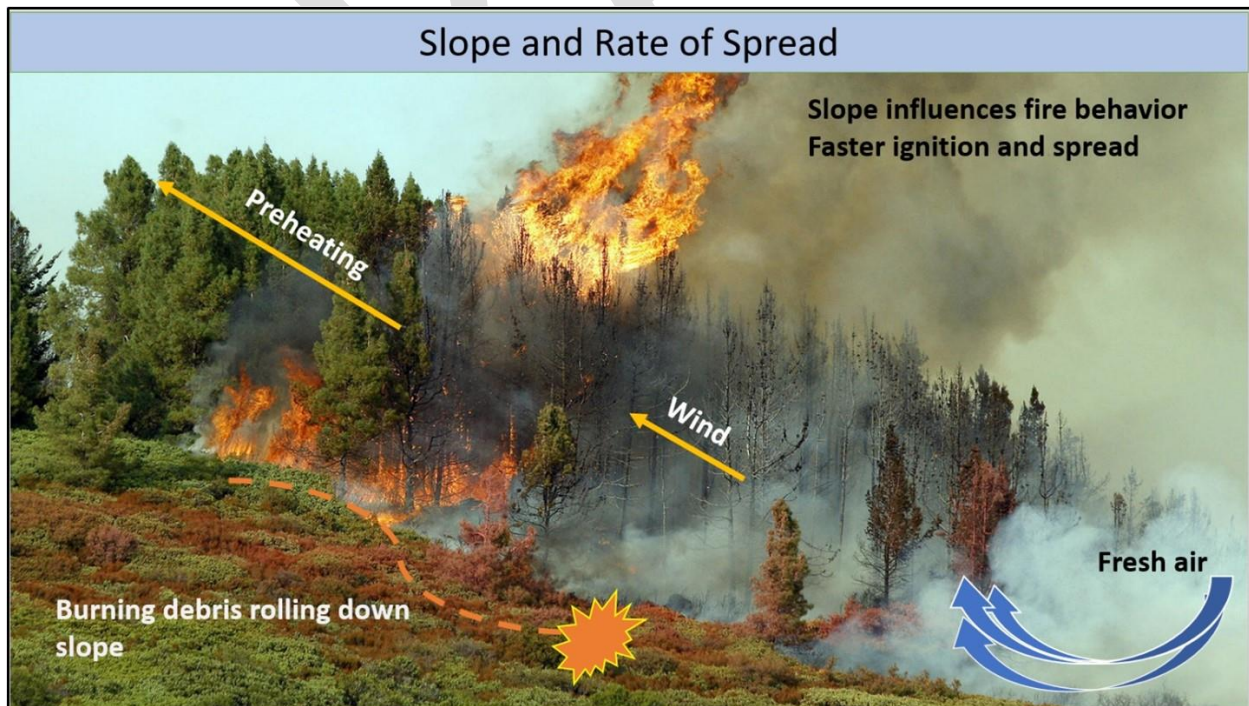
8 The pattern for fireline intensity is similar to flame length in that intensities range from very low
9 (0 Btu/ft/sec) through moderate (100–500 Btu/ft/sec) to high and extreme intensity (greater than
10 1,000 Btu/ft/sec), which tend to be associated with areas dominated by tall shrub and timber fuel loads.
11 Fireline intensity impacts the strategies that fire responders can use to suppress the fire, with intensities
12 over 1,000 Btu/ft/sec too severe for direct attack by hand or engine crews.

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

15 Rate of Spread

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

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



22
23 **Figure 3.1. Effect of topography on fire behavior.**

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

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

7 Crown Fire Potential

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

11 Fire Occurrence/Density of Starts

12 Figure 2.5 in Chapter 2 illustrates the fire history for the Planning Area. These perimeters have been
13 provided by the USFS and CAL FIRE, and show the location of fires within the Planning Area from 1923
14 to 2021. Fire history data were used to determine the location where fires tend to occur more often. Map
15 C.6 (Appendix C) shows the density of fire events within the Planning Area and reveals a higher
16 incidence of fire events to the north and south of 40 Acres. The fire history map (see Figure 2.5 in
17 Chapter 2) and fire occurrence density map (see Map C.6 in Appendix C) are used to provide information
18 on areas where fires are prevalent and hence could be more prone to fire in the future.

19 Composite Risk-Hazard Assessment Model

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

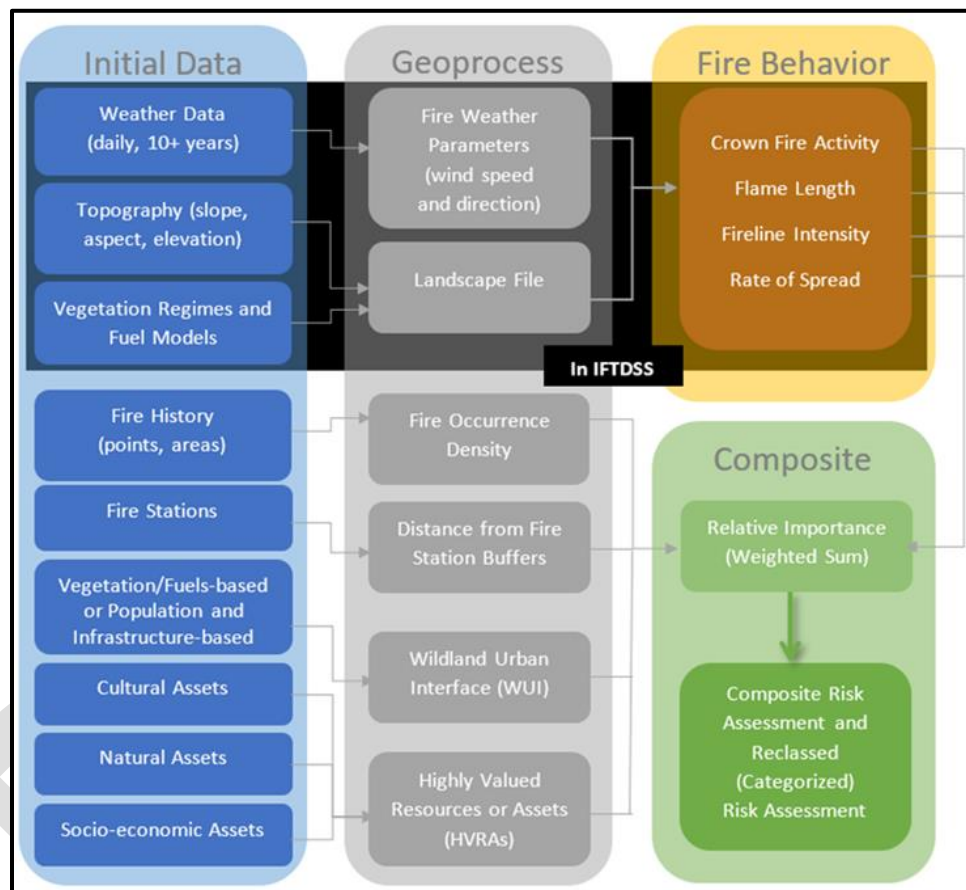
23 All fire parameter data sets have been converted to a raster format (a common GIS data format
24 comprising a grid of cells or pixels, with each pixel containing a single value). The cell size for the data is
25 30 x 30 meters (98 x 98 feet). Each of the original cell values have been reclassified with a new value
26 between 1 and 4, based on the significance of the data (1 = lowest, 4 = highest). Prior to running the
27 models on the reclassified data sets, each of the input parameters have been weighted; that is, they are
28 assigned a percentage value reflecting that parameter's importance in the model. We used the weighted
29 sum raster overlay geoprocessing tool to stack each geographically aligned data set and evaluate an
30 output value derived from each cell value of the overlaid data set in combination with the weighted
31 assessment. In a Weighted Sum Model, the weighted values of each cell from each parameter data set
32 are added together so that the resulting data set contains cells with summed values of all the parameters.
33 This method ensures that the model resolution is maintained in the results and thus provides finer detail
34 and range of values for denoting fire risk.

35 Composite Risk-Hazard Assessment Modeling Process

36 Our Composite Risk-Hazard Assessments comprise multiple inputs, which can be grouped into three
37 categories: hazard, threat, and values. The result is a raster data layer that weighs and sums those inputs
38 to determine risk. Data sets in the hazard category include historical weather data, topography,
39 vegetation, and fuel regimes. Data sets in the threat category include fire history points and perimeters.

1 The values category includes the WUI, distance from fire station, and natural, cultural, and socioeconomic
2 assets data sets.

3 As shown in Figure 3.2 with the elements in the black shaded box, we began by using the IFTDSS
4 application to prepare a landscape file for the Planning Area. This landscape file compiles multiple
5 LANDFIRE data sets, including fuels (calibrated to recent fires), slope, elevation, and aspect, into one
6 layer that can then be used to develop fire behavior outputs. We then edited the fuels model to match the
7 more precise local data sets and used the edited fuels and landscape file to create custom fire behavior
8 outputs.



9
10 **Figure 3.2. Composite Risk-Hazard Assessment breakdown.**

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

14 Finally, we used ArcGIS Pro to run a weighted sum raster process to add all the inputs together. Risk
15 assessment inputs were assigned weights according to their significance and Core Team input, and all
16 eight inputs were weighted equally due to their potential influence on wildfire risk (Table 3.3).

17 The distance from the nearest fire station(s) to the community typically determines fire response times.
18 The WUI and HVRA designate areas that constitute life, property, and critical infrastructure. Lastly, fire
19 occurrence and fire behavior characteristics (crown fire activity, fireline intensity, flame length, and rate of
20 spread) determine where a fire is likely to occur and the type, intensity, and speed at which the fire
21 spreads.

1 **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%
Fire occurrence density	CAL FIRE	12.5%
HVRA	Inyo County GIS and IFTDSS	12.5%
WUI*	Delineated according to fuels and topography	12.5%
Distance from fire stations†	Fire stations from IFTDSS	12.5%

2 *We used a 5-mile buffer based on Core Team guidance regarding wind, fuels, and topography in the region.
 3 †Distance from fire stations was partitioned in 5-, 10-, and 15-minute drive time intervals: 5-minute rated 0, 10-minute rated 1,
 4 15-minute rated 2, and >15-minute rated 3. We used the ESRI tool—generate service areas—and configured the analysis for
 5 access for emergency vehicles.

6 COMPOSITE RISK-HAZARD ASSESSMENT RESULTS

7 The Composite Risk-Hazard Assessment modeling approach uses a weighted sum model, which “stacks”
 8 geographically aligned data sets and evaluates an output value derived from each cell value of the
 9 overlaid data set in combination with the weighted assessment. In a weighted sum model, the weighted
 10 values of each pixel from each parameter data set are added together so that the resulting data set
 11 contains pixels with summed values of all the parameters. This method ensures that the model resolution
 12 is maintained in the results and thus provides finer detail and range of values for denoting fire risk. While
 13 weighted sum composite rasters can be better for describing more detailed variations in risk, they can be
 14 overwhelming and difficult to understand, so we also created a reclassified raster from the weighted sum
 15 composite, using the natural breaks (Jenks) method, with four categories of low, medium, high, and
 16 extreme risk. Figure 3.3 illustrates the individual data sets and the relative weights assigned within the
 17 modeling framework. Table 3.3 shows the same data sets and weights but includes the data source.
 18 These include fire behavior parameters, fire occurrence density, HVRA, WUI, and distance from fire
 19 stations. Figure 3.4 is the Composite Risk-Hazard Assessment for the Planning Area and classifies the
 20 Planning Area into low, moderate, high, and extreme risk categories.

21 Overall, the Composite Risk-Hazard Assessment (see Figure 3.4) shows high and extreme risk areas
 22 around the perimeter of 40 Acres, with extreme risk areas concentrated to the east, south, and southwest.

23 Moreover, discussions with local experts revealed that fires in the region are driven by strong west and
 24 southwest winds (and occasionally, north) and that the region has a history of fires along riparian
 25 corridors. Indeed, the riparian fuel bed leading into 40 Acres from the southwest (Pine Creek diversion) is
 26 classified as extreme risk.

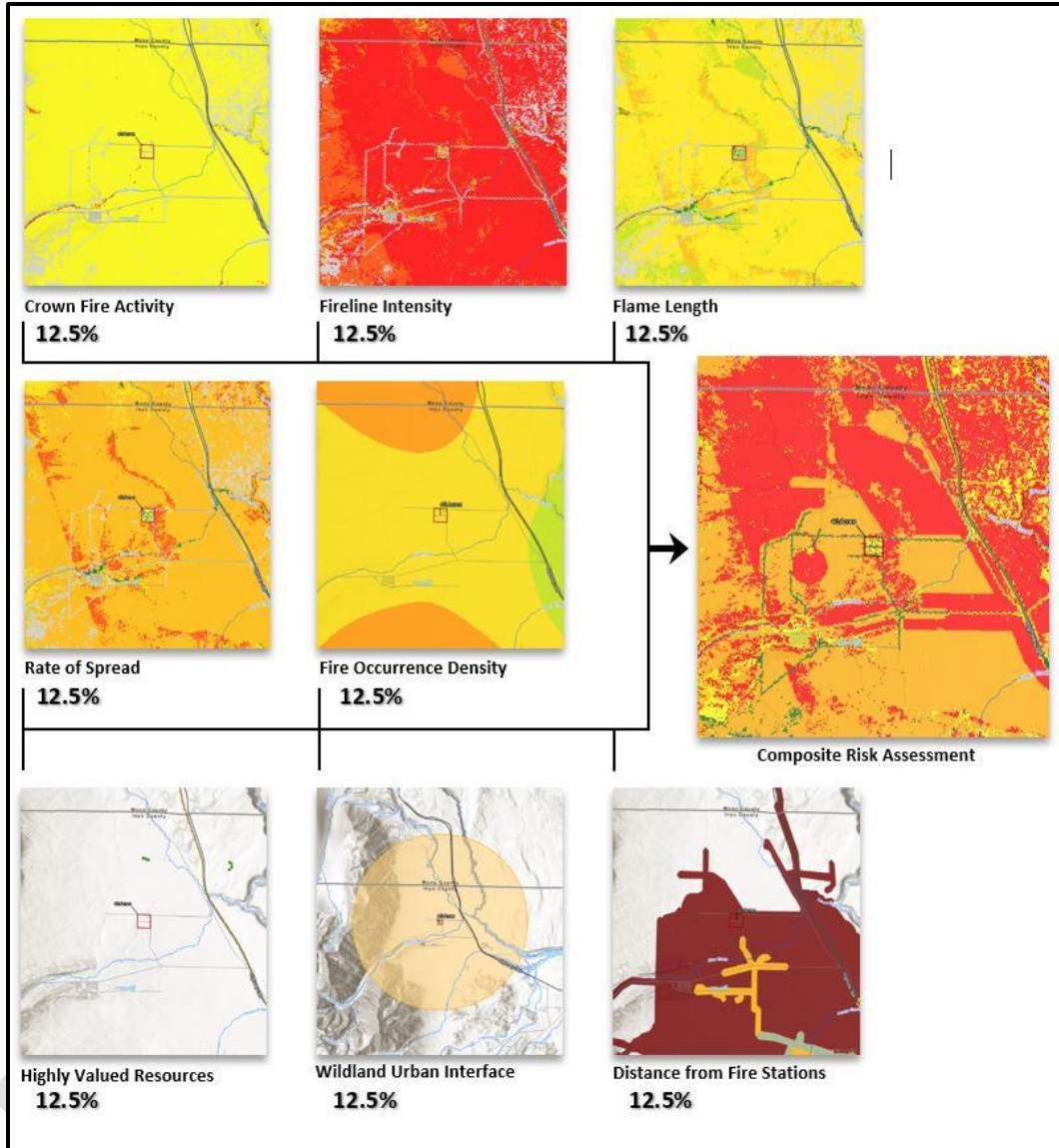
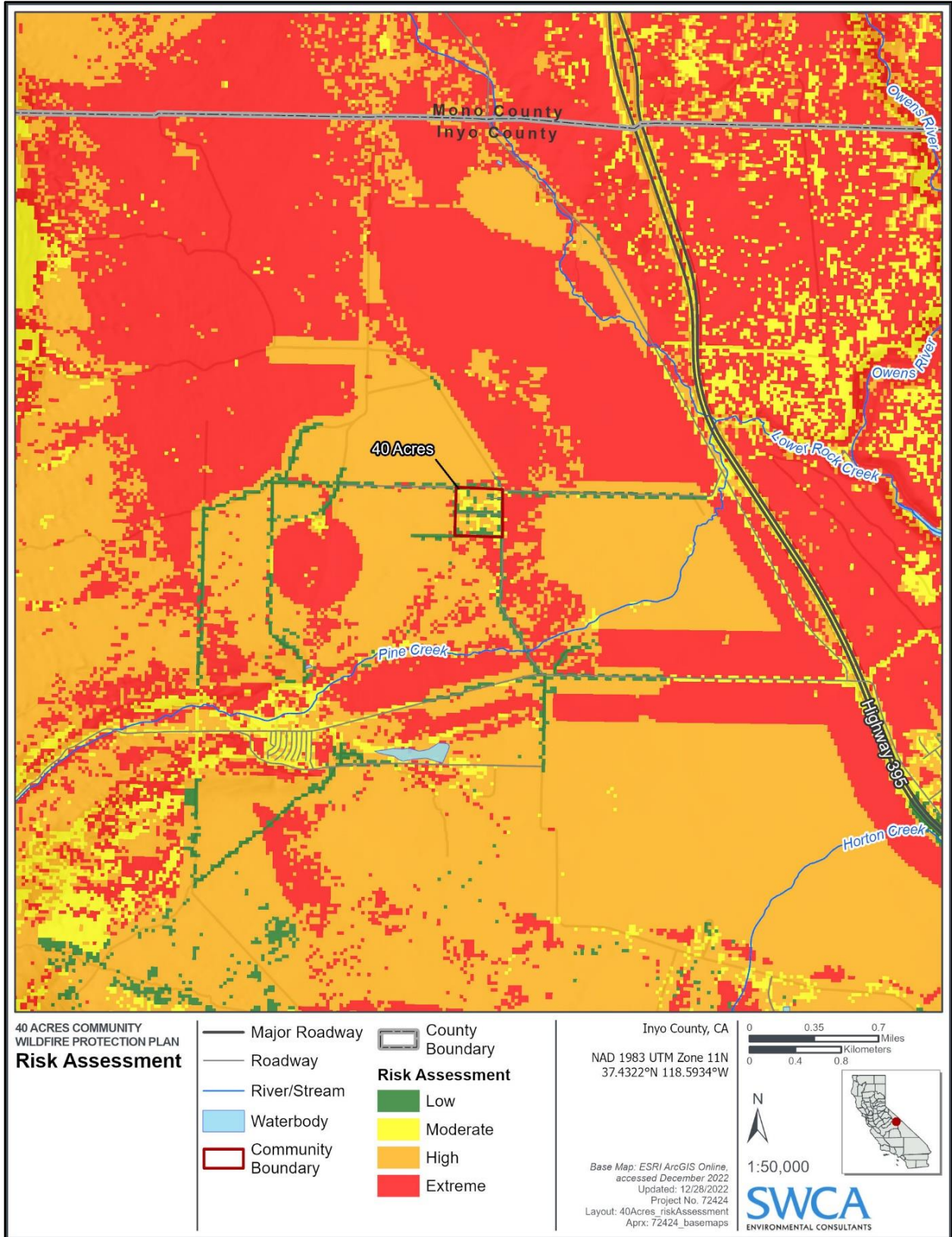


Figure 3.3. Composite Risk-Hazard Assessment overlay process.

1
2



1
2

Figure 3.4. Composite Risk-Hazard Assessment.

1 VALUES AT RISK

2 Earlier compilation of the critical infrastructure in the Planning Area, coupled with the community
3 assessments, public outreach, and Core Team input, has helped in the development of a list of VARs
4 from wildland fire. These data are also supplemented with HVRA data, which is a data set that is being
5 gathered nationwide and available through the Interagency Fuel Treatment Decision Support System
6 (IFTDSS). The public was encouraged to provide additional VARs during the public outreach period, via
7 the story map survey link. Based on feedback provided, this section and the associated mapping was
8 revised.

9 In addition to critical infrastructure, VARs can also include natural, social, and cultural resources. It is
10 important to note that although an identification of VARs can inform treatment recommendations, a
11 number of factors must be considered in order to fully prioritize areas for treatment; these factors include
12 appropriateness of treatment, land ownership constraints, locations of ongoing projects, available
13 resources, and other physical, social, or ecological barriers to treatment.

14 The scope of this CWPP does not allow determination of the absolute natural, socioeconomic, and
15 cultural values that could be impacted by wildfire in the Planning Area. In terms of socioeconomic values,
16 the impact due to wildfire would cross many scales and sectors of the economy and call upon resources
17 locally, regionally, and nationally.

DRAFT

1 NATURAL VALUES AT RISK

2 The CWPP Planning Area and the adjacent federal land have a variety of natural resources of particular
 3 concern to land managers, such as rare habitats and listed plant and wildlife species. Public outreach
 4 throughout the community has emphasized the importance of protecting natural/ecological values to the
 5 general public (Figure 3.5). Examples of natural values identified by the public and the Core Team include
 6 the following:

- | | | | |
|----|--|----|--|
| 7 | • Public land (e.g., Inyo National Forest, | 12 | • Wildlife habitat and sensitive species |
| 8 | BLM lands) | 13 | • Archeological sites |
| 9 | • Trail systems (e.g., BLM trails) | 14 | • Watersheds and preservation of water |
| 10 | • Agricultural land | 15 | quality for 40 Acres |
| 11 | • Scenic viewsheds | | |



16
 17 **Figure 3.5. Example of a natural VAR, public trails.**

1 SOCIOECONOMIC VALUES AT RISK

2 Social values include population, recreation, infrastructure, and the built environment (Figure 3.6).

3 The entire community of 40 Acres falls within the WUI. Examples include the following:

- | | | | |
|---|--|----|--------------------------------|
| 4 | • Communications infrastructure, | 9 | • Schools |
| 5 | powerlines, (e.g., cell phone, weather | 10 | • Public safety infrastructure |
| 6 | stations, and radio towers) | 11 | • Highways |
| 7 | • Water infrastructure and storage | | |
| 8 | • Recreation sites (e.g., campgrounds) | | |

DRAFT



1
2
3

Figure 3.6. Example of a socioeconomic VAR, Pine Creek flume, which could be impacted by post-fire erosion and sedimentation.

1 CULTURAL VALUES AT RISK

2 Several historical landmarks are scattered throughout the region. Cultural VARs that have been identified
3 by the Core Team and the public in the CWPP Planning Area are the following:

- 4 • Barns
- 5 • Agricultural infrastructure
- 6 • Historic houses

DRAFT



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 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.

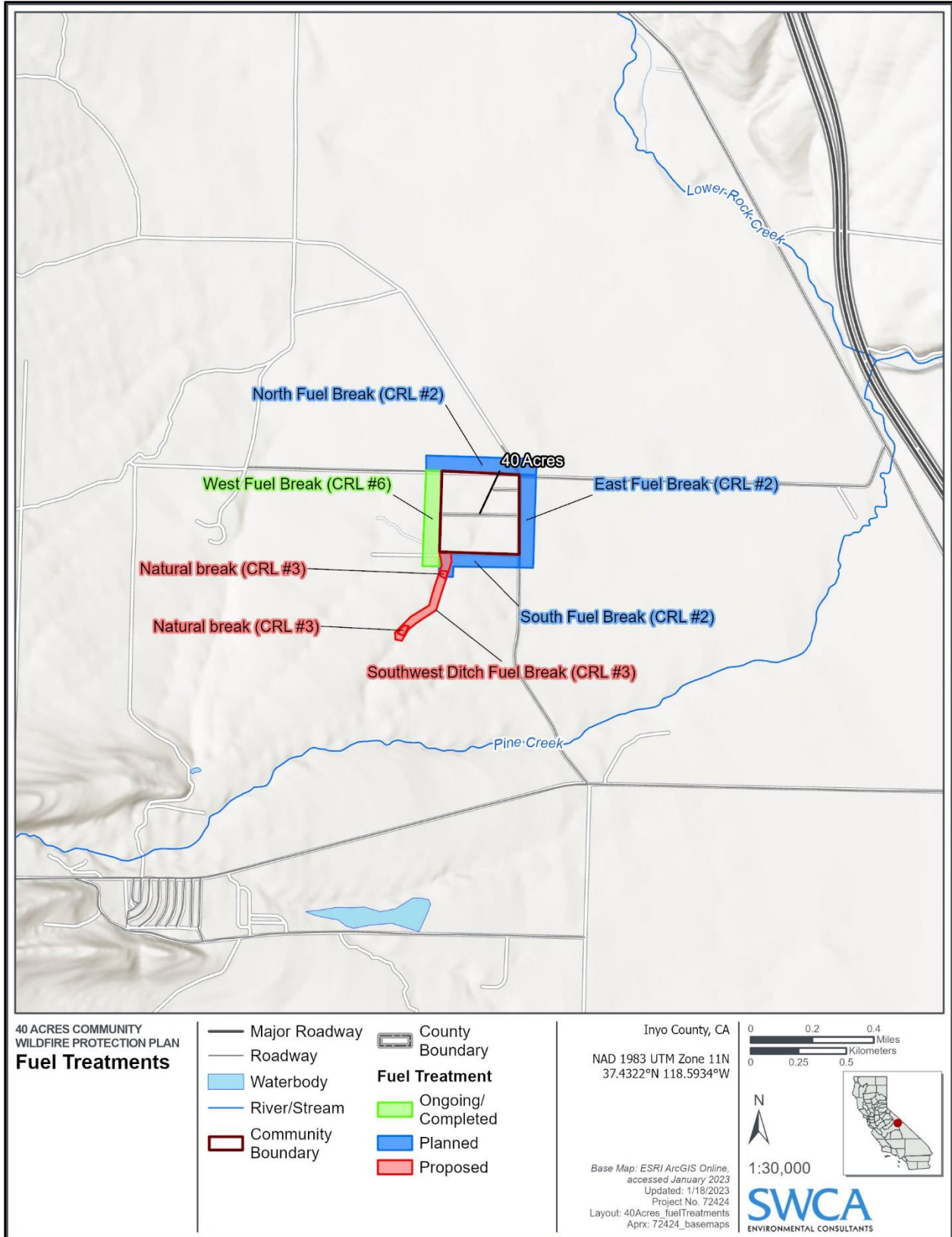
“Sustaining landscape resiliency and the role of wildland fire as a critical ecological process requires a mix of actions that are consistent with management objectives. The West will use all

1 *available methods and tools for active management of the landscape to consider and conserve a*
2 *diversity of ecological, social, and economic values. The West will coordinate with all partners*
3 *and seek continued stakeholder engagement in developing market-based, flexible and proactive*
4 *solutions that can take advantage of economies of scale. All aspects of wildland fire will be used*
5 *to restore and maintain resilient landscapes. Emphasis will be placed on protecting the middle*
6 *lands near communities.” (Western Regional Strategy Committee [WRSC] 2013:14).*

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

9 The federal lands surrounding 40 Acres have been home to an active fuel treatment program by land
10 managers for many years. Figure 4.1 shows existing fuel treatments that have been completed or
11 planned in and around the Planning Area. This information is derived from the BLM and the 40 Acres Fire
12 Safe Council (FSC). The reader is referred to agency websites and the [Federal Register](#) for the latest
13 information on planned or ongoing actions on adjacent public land. The treatment already observed
14 surrounding the Planning Area should be built upon to increase fuel treatment effectiveness across the
15 landscape.

DRAFT



1
2 **Figure 4.1. Ongoing, planned, and proposed fuels treatments around 40 Acres. Note: the “CRL #”**
3 **text refers to the Project ID in Table 4.1.**

1 RECOMMENDATIONS FOR HAZARDOUS FUEL REDUCTION

2 Fuels management of public and private land in the WUI is key to the survival of homes during a wildfire
3 event, as well as the means to meet the criteria of Goal 1. Research has shown how fuel treatments in
4 the WUI can change fire behavior to support suppression activities and protect homes (Evans et al.
5 2015). The importance of fuels management is reflected in policy at the federal level, with the HFRA
6 requiring that federal land management agencies spend at least 50% of their fuels reduction funds on
7 projects in the WUI.

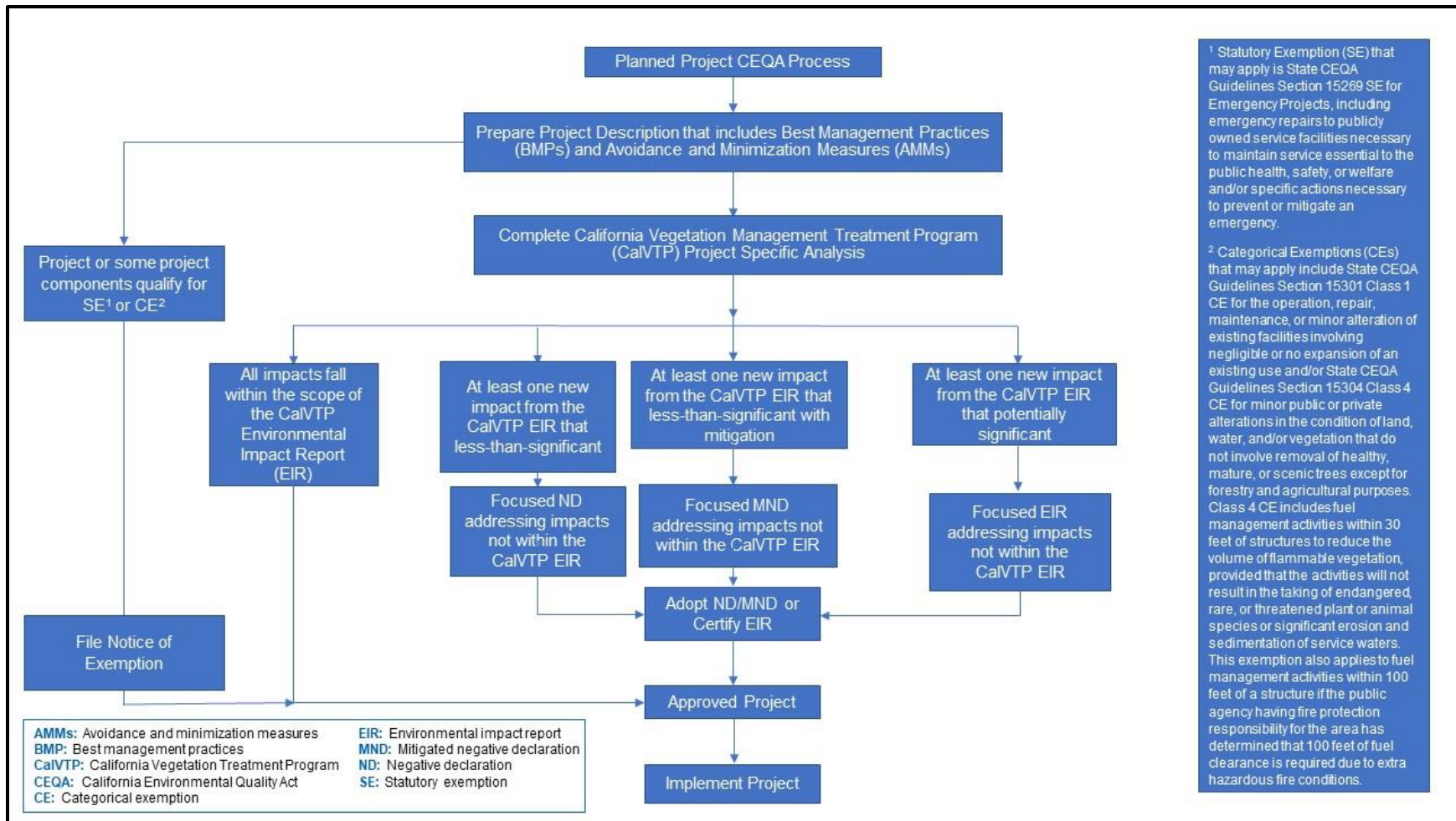
8 Fuels should be modified with a strategic approach to reduce the threat that high-intensity wildfires pose
9 to lives, property, and other values. This section provides information on fuel treatment methodologies
10 that can be applied to protect structures (defensible space) as a top priority, then near community
11 boundaries (fuel breaks, cleanup of adjacent open spaces), and finally in the wildlands beyond
12 community boundaries (larger-scale forest health and restoration treatments). The emphasis of each of
13 these treatment types is unique. Proximate to structures, the recommendations focus on reducing fire
14 intensity and fire spread rates consistent with Firewise and International Fire Code standards. Further
15 into open space areas, treatments tend to emphasize forest health and increasing resiliency to
16 catastrophic wildfire and other disturbances.

17 Table 4.1 summarizes the types of treatments recommended throughout the Planning Area. The majority
18 of the treatments are focused on higher risk areas, as defined by the Composite Risk-Hazard
19 Assessment and Core Team input. Tables 4.1, 4.2, and 4.3 also address the requirement for an action
20 plan and assessment strategy by providing monitoring guidelines and a timeline for implementation.
21 This timeline is obviously dependent on available funding and resources, as well as the National
22 Environmental Policy Act (NEPA) and CEQA protocols for any treatments pursued on public land.
23 See Figure 4.2 to view the CEQA process for California Vegetation Treatment Program (CalVTP)
24 implementation. It should be noted that CalVTP is not the only option available to comply with CEQA
25 requirements; project-specific negative declarations or mitigated negative declarations may also be
26 employed.

27 When applying fuel treatments, every effort should be made to align treatments with the State Forest
28 Action Plan Assessment and Strategy (CAL FIRE 2018a, 2018b) with consideration of all appropriate best
29 management practices and sound science. In addition, treatments should be strategically located in areas
30 to maximize effectiveness of other existing and ongoing projects (Figure 4.1). A list and detailed
31 descriptions of fuels treatment types and methods, including defensible space practices and larger-scale
32 projects, is housed in Appendix J.

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

37 The treatment list is by no means exhaustive and serves to provide a baseline of required projects for the
38 future management of the Planning Area. Many projects may be eligible for grant funds available from
39 federal and/or state sources. For a list of funding sources, please refer to Appendix F.



1
2 **Figure 4.2. CEQA process for CalVTP implementation.**

Ongoing, Planned, and Proposed Fuels Treatments in 40 Acres

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 dead tree and shrub removal 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 to 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.

The 40 Acres FSC has been proactive in planning and implementing fuel breaks around the perimeter of 40 Acres. Figure 4.1 above shows the ongoing, planned, and proposed fuels reductions projects in 40 Acres. The west fuel break was recently completed and included treatment on 7.2 Acres of BLM land (Figure 4.3). Fuel breaks to the north (8 acres along Birchim Lane), east (7.2 acres along North Round Valley Road), and south (6.8 acres along Hardy Road) are currently in the works (see Figure 4.1).

In addition, the Core Team and the Risk-Hazard Assessment identified the southwest ditch as a priority area for fuel reduction due to the dense and continuous fuel bed as well as topography and wind patterns. Therefore, fuel reductions along this ditch are identified as a high-priority project for 40 Acres (see Table 4.1 and Figure 4.1).



Figure 4.3. The 7.2-acre fuel break on the west side of 40 Acres.

1 **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	Spring 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.	Along ditches and creeks, focusing on the southwest ditch	40 Acres FSC, LADWP (to provide access and coordination), CDFW, BLM	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Limit the spread of wildland fire and increase access to water resources with strategic placement of fuel breaks Provide for safe and effective wildfire response capabilities 	<ul style="list-style-type: none"> Frequent maintenance since riparian vegetation grows quickly 	<ul style="list-style-type: none"> 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	Ongoing	H	According to project schedule	Follow through with the planned fuel breaks on the north, east, and south sides of the community Refer to Figure 4.1	Eastern, northern, and southern boundaries	LADWP (to provide access and coordination), CAL FIRE, 40 Acres FSC	<ul style="list-style-type: none"> Work with LADWP and CDFW to install fuel breaks on the north, east, and south sides of the community 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Regular maintenance is needed to ensure the fuel break remains clear of dense and flammable vegetation Monitor for invasive species 	<ul style="list-style-type: none"> CAL FIRE Grant Programs USFS CWDG
CRL #3		H	Fall 2024	Work with CDFW and BLM to install fuel breaks along the ditch to the southwest Refer to Figure 4.1	Southwest ditch	40 Acres FSC, CAL FIRE, BLM	<ul style="list-style-type: none"> Search for natural breaks in vegetation to create fuel breaks up to a quarter mile upstream from 40 Acres Align treatment with CDFW land management and habitat objectives 	<ul style="list-style-type: none"> Balance the reduction of hazardous fuels with the protection of wildlife habitat Protect life and property by mitigating fuels 	<ul style="list-style-type: none"> Regular maintenance is needed to ensure the fuel break remains clear of vegetation. Monitor for invasive species 	<ul style="list-style-type: none"> FEMA Building Resilient Infrastructure and Communities Grant (BRIC) USFS CWDG Grants CAL FIRE Grant Programs
CRL #4		H	Fall 2024	Increase workforce and firefighting personnel capacity	40 Acres and surrounding area	CAL FIRE	<ul style="list-style-type: none"> Develop workforce to implement and maintain needed hazardous fuels projects and to perform defensible space inspections Seek recruitment opportunities with non-profits such as the California Conservation Corps 	<ul style="list-style-type: none"> Reduce wildfire risk through greater capacity for wildfire projects Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI. 	<ul style="list-style-type: none"> Assess capacity on an annual basis 	<ul style="list-style-type: none"> FEMA Staffing for Adequate Fire and Emergency Response FEMA Assistance to Firefighters Grants California Fire Foundation Grant Program USFS CWDG
CRL #5		H	Spring 2024	Support fuel reduction efforts on private property by addressing green waste management	40 Acres	Inyo County, 40 Acres FSC, CAL FIRE, BLM	<ul style="list-style-type: none"> County to investigate how to acquire, rent, or borrow a chipper from BLM or CAL FIRE 40 Acres FSC to coordinate/establish chipper days for the communities Consider liability concerns if trained personnel are not on-site to operate equipment 	<ul style="list-style-type: none"> Support community defensible space efforts Reduce fuel loading within the community 	<ul style="list-style-type: none"> Springtime, yearly 	<ul style="list-style-type: none"> CAL FIRE Forest Health Grants Firewise Communities Grants California Fire Safe Council Grants USFS CWDG
CLR #6	Ongoing	H	According to project schedule	Maintain the fuel break on the west side of 40 Acres Refer to Figure 4.1	40 Acres	BLM, CAL FIRE, 40 Acres FSC	<ul style="list-style-type: none"> Continue to apply the current approach 	<ul style="list-style-type: none"> Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI 	<ul style="list-style-type: none"> As scheduled 	<ul style="list-style-type: none"> CAL FIRE Grant Programs USFS CWDG Grants FEMA Building Resilient Infrastructure and Communities Grant (BRIC)

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

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 wildfire without loss of life and property. The basic premise of this goal is:

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

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

RECOMMENDATIONS FOR PUBLIC EDUCATION AND OUTREACH

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

Most residents in the WUI understand the risk that wildfire poses to their communities. However, it is important to continually engage the community as a partner 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.

Please see Appendix B for a list of educational resources.

Table 4.2 lists public education recommendations to be implemented in 40 Acres.

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 40 Acres CWPP 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 material, 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. In essence, reducing structural ignitability and creating defensible space are key for protecting from the potential loss and damage due to intense wildfires, such as the 2015 Round Fire, in and around the Planning Area. Detailed information regarding defensible space practices, as well as a list of actions for reducing structural ignitability, can be found in Appendix J.

Pertinent information regarding recent legislation related to Goal 2 of the Cohesive Strategy is provided below.

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 (California Governor's Office of Planning and Research [CA GOPR] 2020a).

1 **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	40 Acres	40 Acres FSC, CAL FIRE, and Inyo County OES	<ul style="list-style-type: none"> • Create wildfire information and education documents to distribute • 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) • 40 Acres FSC to engage new homeowners/renters to promote fire education for property residents, even if temporary • 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. • Seek opportunities to work with the Whitebark Institute for defensible space and home hardening workshops and/or community demonstrations 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Review and revise strategy on an annual basis 	<ul style="list-style-type: none"> • FEMA Building Resilient Infrastructure and Communities (BRIC) Grants • EPA Environmental Education Grants • CAL FIRE Grant Programs • California Fire Safe Council Grants • USFS CWDG
FAC #2		H	Fall 2023	Seek Firewise Community Certification for 40 Acres	40 Acres	40 Acres FSC	<ul style="list-style-type: none"> • Work with Firewise USA, the California FSC, and the Inyo County Wildfire Coordinator to begin the process of Firewise certification if community supports involvement • Evaluate community interests in Firewise Certification • Conduct a cost-benefit analysis of forming a Firewise certified community • Engage local, county, and state stakeholders 	<ul style="list-style-type: none"> • Reduce wildfire risk through community collaboration • Facilitate access to funding and assistance • Develop a framework for action 	<ul style="list-style-type: none"> • Maintain "good standing" by reporting work completed and accomplishments on an annual basis 	<ul style="list-style-type: none"> • Firewise Grants • California Fire Safe Council Grants • USFS CWDG
FAC #3		H	Spring 2024	Implement community events focused on vulnerable populations	40 Acres	40 Acres FSC and Inyo County OES	<ul style="list-style-type: none"> • Identify 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 	<ul style="list-style-type: none"> • Reduce wildfire risk through greater adoption of Firewise and structure hardening measures 	<ul style="list-style-type: none"> • Yearly, in preparation for the fire season • Conduct annual review to determine what works and what doesn't 	<ul style="list-style-type: none"> • FEMA BRIC Grants • CAL FIRE Grants • California Fire Safe Council 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 #4		H	Fall 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	40 Acres	Inyo County OES, 40 Acres FSC	<ul style="list-style-type: none"> 40 Acres FSC to work with the County to identify funding opportunities 40 Acres 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 	<ul style="list-style-type: none"> Assist vulnerable populations with wildfire risk reduction Support community defensible space efforts Reduce fuel loading within the community 	<ul style="list-style-type: none"> Establish a program to determine frequency of activities 	<ul style="list-style-type: none"> Firewise Grants CAL FIRE Wildfire Prevention Grants California Fire Safe Council Grants USFS CWDG
FAC #5		H	Summer 2023	Involve second-home owners and absentee homeowners in wildfire education and mitigation efforts	40 Acres	Inyo County OES, 40 Acres FSC	<ul style="list-style-type: none"> Inyo County Wildfire Coordinator to use the county assessor's mailing list to pull contact information for second homes and absentee homeowners 	<ul style="list-style-type: none"> Encourage community-wide involvement in wildfire prevention and mitigation efforts 	<ul style="list-style-type: none"> Biannual 	Not applicable
FAC #6		H	Spring 2023	Implement and maintain defensible space and structure hardening measures	40 Acres	Community residents and homeowners	<ul style="list-style-type: none"> Implement defensible space standards in the community Upgrade combustible construction materials to fire-resistive materials Seek opportunities to partner with Team Rubicon (https://teamrubiconusa.org/) for free wildfire mitigation support 	<ul style="list-style-type: none"> Reduce wildfire risk through greater adoption of Firewise and structure hardening measures 	<ul style="list-style-type: none"> Yearly maintenance 	<ul style="list-style-type: none"> CAL FIRE Wildfire Prevention Grants Firewise grants California Fire Safe Council Grants USFS CWDG
FAC #7		M	Spring 2024	Establish relationships with non-profit and public agencies to increase capacity	40 Acres	40 Acres FSC and Inyo County OES	<ul style="list-style-type: none"> Investigate opportunities to form relationships with non-profit agencies such as California Conservation Corps, American Conservation Experience, and Team Rubicon (https://teamrubiconusa.org/) 	<ul style="list-style-type: none"> Create resilient landscapes and address potential for extreme wildfire behavior in and around the community 	N/A	Not applicable
FAC #8		M	Spring 2024	Conduct a community walkthrough	40 Acres	40 Acres FSC, CAL FIRE, BLM	<ul style="list-style-type: none"> CAL FIRE and BLM staff to host a community walkthrough day with community residents to determine potential projects and needs for defensible space, fuel breaks, and fire response 	<ul style="list-style-type: none"> Increase wildfire preparedness and community safety Engage and involve community members 	<ul style="list-style-type: none"> Conduct on an annual basis 	Not applicable
FAC #9		M	Spring 2025	Address excess rubbish and debris on private properties	40 Acres	Inyo County OES, Inyo County Board of Supervisors	<ul style="list-style-type: none"> Investigate the feasibility of establishing a county ordinance to mandate the clearing of hazardous rubbish and debris 	<ul style="list-style-type: none"> Decrease hazardous combustible materials from the community Enhance community safety 	N/A	Not applicable
FAC #10		H	Summer 2024	Establish a community pre-fire plan	40 Acres	40 Acres FSC, 40 Acres homeowners, CAL FIRE, Inyo County OES	<ul style="list-style-type: none"> 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 elderly residents that may need assistance with evacuation 	<ul style="list-style-type: none"> Promote community involvement Improve community preparedness 	<ul style="list-style-type: none"> Yearly updates 	<ul style="list-style-type: none"> CAL FIRE Wildfire Prevention Grants California Fire Safe Council Grants Firewise Grants USFS CWDG

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

COHESIVE STRATEGY GOAL 3: WILDFIRE RESPONSE

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

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

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

RECOMMENDATIONS FOR IMPROVING FIRE RESPONSE CAPABILITIES

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

Table 4.3 provides recommendations for improving firefighting capabilities.

1 **Table 4.3. Recommendations for Safe and Effective Wildfire Response***

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
SEWR #1		H	Fall 2024	Identify roads and shelter-in-place locations and inform residents about evacuation procedures	40 Acres	40 Acres FSC, Inyo County OES	<ul style="list-style-type: none"> Identify shelter-in-place locations and distribute maps to all residents Distribute information regarding County designated community shelters Distribute evacuation materials using resources from CAL FIRE, Firewise, and Ready, Set, GO! Increase education through community workshops and mock evacuation drills Develop a map that clearly shows all roads with potential ingress and egress points into 40 Acres and distribute to all residents 	<ul style="list-style-type: none"> Improve wildfire response and readiness Facilitate evacuation procedures 	<ul style="list-style-type: none"> Update as needed to reflect changes in evacuation routes and shelter-in-place locations 	<ul style="list-style-type: none"> EPA Environmental Education Grants FEMA Fire Prevention and Safety Grants Firewise Communities Grants CAL FIRE Fire Prevention Grants USFS CWDG
SEWR #2		M	Spring 2025	Expand coverage of Alert California live cameras	40 Acres	Alert California Core University Partners	<ul style="list-style-type: none"> Investigate opportunities to install cameras where there is limited coverage 	<ul style="list-style-type: none"> Enhance wildfire response and readiness Support early attack plans Facilitate emergency notifications such as evacuation orders 	<ul style="list-style-type: none"> Follow existing maintenance schedule 	<ul style="list-style-type: none"> FEMA Building Resilient Infrastructure and Communities Grants CAL FIRE Fire Prevention Grants USFS CWDG
SEWR #3		H	Fall 2024	Improve wildfire emergency notification systems	40 Acres	Sheriff's Office and Inyo County OES	<ul style="list-style-type: none"> Investigate the feasibility of installing a siren system in the community Establish a reliable source (website or notification system) to relay alerts and messages quickly and consistently Inyo County to continue the process of upgrading the Inyo OES website 	<ul style="list-style-type: none"> Provide timely emergency alerts Facilitate evacuation efforts 	<ul style="list-style-type: none"> Periodic testing of siren system 	<ul style="list-style-type: none"> FEMA BRIC Grants CAL FIRE Community Wildfire Prevention Grants USFS CWDG
SEWR #4		H	Winter 2023	Create additional means of ingress and egress	40 Acres	40 Acres FSC, BLM	<ul style="list-style-type: none"> Connect Ocean View Road to the BLM road to the west Work with CAL FIRE to determine road width specifications and requirements 	<ul style="list-style-type: none"> Provide alternative evacuation routes Provide additional access points for fire responders 	<ul style="list-style-type: none"> As needed to prevent encroachment of vegetation 	<ul style="list-style-type: none"> FEMA Fire Prevention and Safety Grants FEMA BRIC Grants CAL FIRE Community Wildfire Prevention Grants USFS CWDG
SEWR #5		M	Summer 2023	Provide sufficient clearance between power lines and trees	40 Acres	40 Acres FSC, Southern California Edison (SCE), LADWP	<ul style="list-style-type: none"> Utilize SCE's tree removal/maintenance program to maintain safe clearance between power lines/poles and trees <ul style="list-style-type: none"> Report hazard trees (trees that are in contact with powerlines or poles) at (800) 655-4555 Use LADWP's hotline to report hazard trees that are leaning and/or touching powerlines and poles (760) 873-0251 <ul style="list-style-type: none"> LADWP patrols will evaluate reports and determine if treatment is needed 	<ul style="list-style-type: none"> Reduce hazard tree encroachment Enhance firefighter safety 	<ul style="list-style-type: none"> As needed 	<ul style="list-style-type: none"> Not applicable
SEWR #6		M	Spring 2024	Maintain dirt roads and trails	40 Acres	CAL FIRE, BLM, Inyo County OES	<ul style="list-style-type: none"> Maintain existing road and trail networks using mechanical treatments 	<ul style="list-style-type: none"> Provide access to fire personnel Establish fuel breaks and fire containment lines 	<ul style="list-style-type: none"> Annually 	<ul style="list-style-type: none"> USFS Community Wildfire Defense Grant CAL FIRE Community Wildfire Prevention Grants FEMA BRIC Grants
SEWR #7		M	Spring 2025	Assess existing water supply for fire suppression and develop a map of backup power sources		CAL FIRE, Inyo County OES	<ul style="list-style-type: none"> Conduct an assessment of water resources in 40 Acres to determine if improvements are needed Identify backup power sources (e.g., solar power and generators) in the community and create a map to distribute to fire agencies and 40 Acres residents 	<ul style="list-style-type: none"> Protect life and property through improved firefighting response Improve firefighter safety 	<ul style="list-style-type: none"> As needed 	<ul style="list-style-type: none"> FEMA BRIC Grants USFS CWDG

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



CHAPTER 5 – MONITORING AND EVALUATION

3 Developing an action plan and an assessment strategy that identifies roles and responsibilities, funding
4 needs, and timetables for completing highest-priority projects is an important step in organizing the
5 implementation of the 40 Acres CWPP. The previous chapter identifies tentative timelines and monitoring
6 protocols for project recommendations, the details of which are outlined below.

7 All stakeholders and signatories to this CWPP desire worthwhile outcomes. It is also known that risk
8 reduction work on the ground, for the most part, is often not attainable in a few months—or even years—
9 and typically requires scheduled maintenance (e.g., annual, semi-annual, etc.). The amount of money
10 and effort invested in implementing a plan such as this requires that there be a means to describe,
11 quantitatively and/or qualitatively, whether the goals and objectives expressed in this plan are being
12 accomplished according to expectations.

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

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

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

1 **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 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

2 **FUELS TREATMENT MONITORING**

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

5 The strategies outlined in this section consider several variables:

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

- 1 • Can there be ecological consequences associated with fuels work? Items to consider include soil
2 movement and/or invasive species encroachment post-treatment. Relatively cost-effective
3 monitoring may help reduce long term costs and consequences.
- 4 • Vegetation will grow back. Thus, fuel break maintenance and fuels modification in both the home
5 ignition zone and at the landscape scale require periodic assessment. Monitoring these changes
6 can help decision-makers identify appropriate treatment intervals.
- 7 • Monitoring for all types of fuels treatment is recommended. For example, in addition to monitoring
8 mechanical treatments, it is important to carry out comprehensive monitoring of burned areas to
9 establish the success of pre-fire fuels reduction treatments on fire behavior, as well as monitoring
10 for ecological impacts, repercussions of burning on wildlife, and effects on soil chemistry and
11 physics. Adaptive management is a term that refers to adjusting future management based on the
12 effects of past management. Monitoring is required to gather the information necessary to inform
13 future management decisions. Economic and legal questions may also be addressed through
14 monitoring. In addition, monitoring activities can provide valuable educational opportunities for
15 students.

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

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

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

24 **Moderate—Level 2:** Multiple Permanent Photo Points

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

29 **High—Level 3:** Basic Vegetation Plots

30 A series of plots can allow monitors to evaluate vegetation characteristics such as species
31 composition, percentage of cover, and frequency. Monitors then can record site characteristics such
32 as slope, aspect, and elevation. Parameters would be assessed pre- and post-treatment.

33 The monitoring agency should establish plot protocols based on the types of vegetation present and
34 the level of detail needed to analyze the management objectives. This method is appropriate for
35 foresters or other personnel monitoring fuel treatments on forested lands.

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

37 The protocol for this level would include the vegetation plots described above but would add more
38 details regarding fuel loading. Crown height or canopy closure might be included for live fuels. Dead
39 and downed fuels could be assessed using other methods, such as Brown's transects (Brown 1974),
40 an appropriate photo series (Ottmar et al. 2000), or fire monitoring (Fire Effects Monitoring and
41 Inventory System [FIREMON]) plots. This method is ideal for foresters or university researchers
42 tracking vegetation changes in forested land.

IMPLEMENTATION

The 40 Acres CWPP makes recommendations for prioritized fuels reduction projects, measures to reduce structural ignitability, and methods for carrying out 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 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. 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

- 1 c. Vegetation
- 2 i. Fuel quantity and type
- 3 ii. Drought and disease impacts
- 4 3. Review action items: Are actions consistent with the plan's objectives?
- 5 a. Check for status, i.e., completed/started/not started
- 6 b. Identify completed work and accomplishments
- 7 c. Identify challenges and limitations
- 8 d. Identify next steps
- 9 4. Assess results: What are the outcomes of the action items?
- 10 a. Multi-agency collaboration
- 11 i. Who was involved in the development of the CWPP?
- 12 ii. Have partners involved in the development process remained involved in the
- 13 implementation?
- 14 iii. How has the planning process promoted implementation of the CWPP?
- 15 iv. Have CWPP partnerships and collaboration had a beneficial impact on the
- 16 community?
- 17 b. Risk assessment
- 18 i. How is the risk assessment utilized to make decisions about fuel treatment
- 19 priorities?
- 20 ii. Have there been new wildfire-related regulations?
- 21 iii. Are at-risk communities involved in mitigating wildfire risk?
- 22 c. Hazardous fuels
- 23 i. How many acres have been treated?
- 24 ii. How many projects are cross-boundary?
- 25 iii. How many residents have participated in creating defensible space?
- 26 d. Structural ignitability
- 27 i. Have there been updates to fire codes and ordinances?
- 28 ii. How many structures have been lost to wildfire?
- 29 iii. Has the CWPP increased public awareness of structural ignitability and reduction
- 30 strategies?
- 31 e. Public education and outreach
- 32 i. Has public awareness of wildfire and mitigation strategies increased?
- 33 ii. Have residents been involved in wildfire mitigation activities?
- 34 iii. Has there been public involvement?
- 35 iv. Have vulnerable populations been involved?

- 1 f. Emergency response
- 2 i. Has the CWPP been integrated into relevant plans (e.g., hazard mitigation or
- 3 emergency operations)?
- 4 ii. Is the CWPP congruent with other hazard mitigation planning efforts?
- 5 iii. Has availability and capacity of local fire departments changed since the CWPP
- 6 was developed?

7 TIMELINE FOR UPDATING THE CWPP

8 The HFRA allows for maximum flexibility in the CWPP planning process, permitting the Core Team to

9 determine the time frame for updating the CWPP. The Core Team members are encouraged to meet on

10 an annual basis to review the project list, discuss project successes, and strategize regarding project

11 implementation funding. It is suggested that the evaluation framework above be used annually to make

12 plan updates, and a more formal revision be made on the fifth anniversary of signing and every 5 years

13 following.

DRAFT

ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
ATV	all-terrain vehicle
BAER	Burned Area Emergency Rehabilitation
BLM	Bureau of Land Management
Btu/ft/sec	British thermal units per foot per second
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
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CE	categorical exemption
CEQA	California Environmental Quality Act
ch/hr	chains per hour
CIG	Conservation Innovation Grants
Cohesive Strategy	National Cohesive Wildland Fire Management Strategy
CRS	Congressional Research Service
CUSP	Coalition for the Upper South Platte
CWA	Clean Water Act
CWPP	community wildfire protection plan
DEM	digital elevation model
DHS	Department of Homeland Security
EMS	Emergency Management System
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESRI	Environmental Systems Research Institute
FEMA	Federal Emergency Management Agency
FIREMON	Fire Effects Monitoring and Inventory System
FLAME	Federal Land Assistance, Management and Enhancement Act
FP&S	Fire Prevention and Safety
FRA	Federal Responsibility Area
FSC	Fire Safe Council
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
LADWP	Los Angeles Department of Water and Power
LRA	Local Responsibility Area
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
USDOJ	U.S. Department of the Interior

USFA	U.S. Fire Administration
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

1
2

DRAFT

GLOSSARY

- 1
- 2 **Aspect:** Cardinal direction toward which a slope faces in relation to the sun (NWCG 2021b).
- 3 **Active Crown Fire:** A crown fire in which the entire fuel complex is involved in flame, but the crowning
4 phase remains dependent on heat released from surface fuel for continued spread. An active crown fire
5 presents a solid wall of flame from the surface through the canopy fuel layers. Flames appear to emanate
6 from the canopy as a whole rather than from individual trees within the canopy. Active crown fire is one of
7 several types of crown fire and is contrasted with **passive crown fires**, which are less vigorous types of
8 crown fire that do not emit continuous, solid flames from the canopy (SWCA).
- 9 **Available Canopy Fuel:** The mass of canopy fuel per unit area consumed in a crown fire. There is no
10 post-frontal combustion in canopy fuels, so only fine canopy fuels are consumed. It is assumed that only
11 the foliage and a small fraction of the branchwood is available (Wooten 2021).
- 12 **Available Fuel:** The total mass of ground, surface and canopy fuel per unit area available to be
13 consumed by a fire, including fuels consumed in postfrontal combustion of duff, organic soils, and large
14 woody fuels (Wooten 2021).
- 15 **Backfiring:** Intentionally setting fire to fuels inside a control line to contain a fire (Wooten 2021).
- 16 **Biomass:** Organic material. Also refers to the weight of organic material (e. g. biomass roots, branches,
17 needles, and leaves) within a given ecosystem (Wooten 2021).
- 18 **Burn Severity:** A qualitative assessment of the heat pulse directed toward the ground during a fire. Burn
19 severity relates to soil heating, large fuel and duff consumption, consumption of the litter and organic layer
20 beneath trees and isolated shrubs, and mortality of buried plant parts (SWCA).
- 21 **Canopy:** The more or less continuous cover of branches and foliage formed collectively by adjacent trees
22 and other woody species in a forest stand. Where significant height differences occur between trees within
23 a stand, formation of a multiple canopy (multi-layered) condition can result (SWCA).
- 24 **Chain:** Unit of measure in land survey, equal to 66 feet (20 M) (80 chains equal 1 mile). Commonly used
25 to report fire perimeters and other fireline distances. Popular in fire management because of its
26 convenience in calculating acreage (example: 10 square chains equal one acre) (New Mexico Future
27 Farmers of America [NM FFA] 2021).
- 28 **Climate adaptation:** Adaptation is an adjustment in natural or human systems to a new or changing
29 environment. Adaptation to climate change refers to adjustment in natural or human systems in response
30 to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial
31 opportunities (CA GOPR 2020b).
- 32 **Climate Change:** A change of climate which is attributed directly or indirectly to human activity that alters
33 the composition of the global atmosphere and which is in addition to natural climate variability observed
34 over comparable time periods (CA GOPR 2020b).
- 35 **Community Assessment:** An analysis designed to identify factors that increase the potential and/or
36 severity of undesirable fire outcomes in wildland urban interface communities (SWCA).
- 37 **Communities at Risk:** Defined by the Healthy Forest Restoration Act of 2003 as “Wildland-Urban
38 Interface Communities within the vicinity of federal lands that are at high risk from wildfire.”
- 39 ○ CAL FIRE expanded on this definition for California including all communities (regardless of
40 distance from federal lands) for which a significant threat to human life or property exists as a

1 result of a wildland fire event. California uses the following three factors to determine at risk
2 communities: 1) high fuel hazard, 2) probability of a fire, and 3) proximity of intermingled
3 wildland fuels and urban environments that are near fire threats (CA GOPR 2020b).

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

10 **Community Wildfire Protection Plan (CWPP):** A planning document that seeks to reduce the threat to
11 life and property from wildfire by identifying and mitigating wildfire hazards to communities and
12 infrastructure located in the wildland urban interface (WUI). Developed from the Healthy Forest
13 Restoration Act of 2003. Addresses issues such as wildfire response, hazard mitigation, community
14 preparedness, or structure protection (SWCA).

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

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

23 **Control:** To construct fireline or use natural features to surround a fire and any control spot fires
24 therefrom and reduce its burning potential to a point that it no longer threatens further spread or resource
25 damage under foreseeable conditions. For reporting purposes, the time and date of control. This term no
26 longer has a strategic meaning in Federal wildland fire policy (Wooten 2021).

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

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

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

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

38 ○ In California, PRC Section 4291, "defensible space" refers to a 100-foot perimeter around a
39 structure in which vegetation (fuels) must be maintained in order to reduce the likelihood of
40 ignition. This space may extend beyond property lines, or 100 feet as required by State law
41 as well as local ordinances, rules, and regulations (CA GOPR 2020b).

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

- 1 **Ecosystem:** An interacting natural system including all the component organisms together with the
2 abiotic environment and processes affecting them (SWCA).
- 3 **Environmental Conditions:** That part of the fire environment that undergoes short-term changes:
4 weather, which is most commonly manifest as windspeed, and dead fuel moisture content (Wooten
5 2021).
- 6 **Escape Route:** A preplanned and understood route firefighters take to move to a safety zone or other
7 low-risk area. When escape routes deviate from a defined physical path, they should be clearly marked
8 (flagged; SWCA).
- 9 **Evacuation:** The temporary movement of people and their possessions from locations threatened by
10 wildfire (SWCA).
- 11 **Federal Responsibility Area (FRA):** A term specific to California, designating areas where the federal
12 government is responsible for fire response efforts. These areas include lands under federal ownership
13 (CA GOPR 2020b).
- 14 **Fire Adapted Communities:** A fire-adapted community collaborates to identify its wildfire risk and works
15 collectively on actionable steps to reduce its risk of loss. This work protects property and increases the
16 safety of firefighters and residents (USFA 2021b).
- 17 **Fire Behavior:** The manner in which fuel ignites, flame develops, and fire spread and exhibits other
18 related phenomena as determined by the interaction of fuels, weather, and topography (Fire Research
19 and Management Exchange System [FRAMES] 2021).
- 20 **Fire Break:** Areas where vegetation and organic matter are removed down to mineral soil (SWCA).
- 21 **Fire Environment:** The characteristics of a site that influence fire behavior. In fire modeling the fire
22 environment is described by surface and canopy fuel characteristics, windspeed and direction, relative
23 humidity, and slope steepness (Wooten 2021).
- 24 **Fire Frequency:** A broad measure of the rate of fire occurrence in a particular area. For historical
25 analyses, fire frequency is often expressed using the fire return interval calculation. For modern-era
26 analyses, where data on timing and size of fires are recorded, fire frequency is often best expressed
27 using fire rotation (SWCA).
- 28 **Fire Hazard:** Fire hazard is the potential fire behavior or fire intensity in an area, given the type(s) of fuel
29 present – including both the natural and built environment – and their combustibility (CA GOPR 2020b).
- 30 **Fire Hazard Severity Zones:** Fire hazard severity zones are defined based on vegetation, topography,
31 and weather (temperature, humidity and wind), and represents the likelihood of an area burning over a
32 30- to 50-year time period without considering modifications such as fuel reduction efforts. In California,
33 CAL FIRE maintains fire hazard severity zone (FHSZ) data for the entire state. There are three classes of
34 fire hazard severity ratings within FHSZs: Moderate, High, and Very High (CA GOPR 2020b).
- 35 **Fire History:** The chronological record of the occurrence of fire in an ecosystem or at a specific site.
36 The fire history of an area may inform planners and residents about the level of wildfire hazard in that
37 area (SWCA).
- 38 **Fire Intensity:** A general term relating to the heat energy released in a fire (SWCA).
- 39 **Fireline Intensity:** Amount of heat release per unit time per unit length of fire front. Numerically, the
40 product of the heat of combustion, quantity of fuel consumed per unit area in the fire front, and the rate of
41 spread of a fire, expressed in kilowatts per minute (SWCA). This expression is commonly used to

- 1 describe the power of wildland fires, but it does not necessarily follow that the severity, defined as the
2 vegetation mortality, will be correspondingly high (Wooten 2021).
- 3 **Fire Prevention:** Activities such as public education, community outreach, planning, building code
4 enforcement, engineering (construction standards), and reduction of fuel hazards that is intended to
5 reduce the incidence of unwanted human-caused wildfires and the risks they pose to life, property or
6 resources (CA GOPR 2020b).
- 7 **Fire Regime:** A measure of the general pattern of fire frequency and severity typical to a particular area
8 or type of landscape: The regime can include other metrics of the fire, including seasonality and typical
9 fire size, as well as a measure of the pattern of variability in characteristics (SWCA).
- 10 **Fire Regime Condition Class:** Condition classes are a function of the degree of fire regime condition
11 class departure from historical fire regimes resulting in alterations of key ecosystem components such as
12 composition structural stage, stand age, and canopy closure (Wooten 2021).
- 13 **Fire Return Interval:** Number of years (interval) between two successive fires in a designated area
14 (SWCA).
- 15 **Fire Severity:** A qualitative measure of the immediate effects of fire on the fire severity ecosystem.
16 It relates to the extent of mortality and survival of plant and animal life both aboveground and
17 belowground and to loss of organic matter. It is determined by heat released aboveground and
18 belowground. Fire Severity is dependent on intensity and residence dependent of the burn. For trees,
19 severity is often measured as percentage of basal area removed. An intense fire may not necessarily be
20 severe (Wooten 2021).
- 21 **Fire Risk:** “Risk” takes into account the intensity and likelihood of a fire event to occur as well as the
22 chance, whether high or low, that a hazard such as a wildfire will cause harm. Fire risk can be determined
23 by identifying the susceptibility of a value or asset to the potential direct or indirect impacts of wildfire
24 hazard events (CA GOPR 2020b).
- 25 **Flammability:** The relative ease with which fuels ignite and burn regardless of the quantity of the fuels
26 (SWCA).
- 27 **Flame Length:** The length of flames in the propagating fire front measured along the slant of the flame
28 from the midpoint of its base to its tip. It is mathematically related to fireline intensity and tree crown
29 scorch height (Wooten 2021).
- 30 **Foliar Moisture content:** Moisture content (dry weight basis) of live foliage, foliar moisture content
31 expressed as a percent. Effective foliar moisture content incorporates the moisture content of other
32 canopy fuels such as lichen, dead foliage, and live and dead branchwood (Wooten 2021).
- 33 **Forest Fire:** uncontrolled burning of a woodland area (National Geographic 2021).
- 34 **Fuel Break:** A natural or manmade change in fuel characteristics which affects fire behavior so that fires
35 burning into them can be more readily controlled (NWCG 2021c).
- 36 **Fuel Complex:** The combination of ground, surface, and canopy fuel strata (Wooten 2021).
- 37 **Fuel Condition:** Relative flammability of fuel as determined by fuel type and environmental conditions
38 (SWCA).
- 39 **Fuel Continuity:** A qualitative description of the distribution of fuel both horizontally and vertically.
40 Continuous fuels readily support fire spread. The larger the fuel discontinuity, the greater the fire intensity
41 required for fire spread (Wooten 2021).

- 1 **Fuel Loading:** The volume of fuel in a given area generally expressed in tons per acre (SWCA). Dead
2 woody fuel loadings are commonly described for small material in diameter classes of 0 to 0.25, 0.25 to 1,
3 and 1 to 3 inches and for large material greater than 3 inches (Wooten 2021).
- 4 **Fuel Management/Fuel Reduction:** Manipulation or removal of fuels to reduce the likelihood of ignition
5 and to reduce potential damage in case of a wildfire. Fuel reduction methods include prescribed fire,
6 mechanical treatments (mowing, chopping), herbicides, biomass removal (thinning or harvesting of trees,
7 harvesting of pine straw), and grazing. Fuel management techniques may sometimes be combined for
8 greater effect (SWCA).
- 9 **Fuel Model:** A set of surface fuel bed characteristics (load and surface-area-to- fuel model volume-ratio
10 by size class, heat content, and depth) organized for input to a fire model (Wooten 2021).
- 11 **Fuel Modification:** The manipulation or removal of fuels (i.e., combustible biomass such as wood,
12 leaves, grass, or other vegetation) to reduce the likelihood of igniting and to reduce fire intensity. Fuel
13 modification activities may include lopping, chipping, crushing, piling and burning, including prescribed
14 burning. These activities may be performed using mechanical treatments or by hand crews. Herbicides
15 and prescribed herbivory (grazing) may also be used in some cases. Fuel modification may also
16 sometimes be referred to as “vegetation treatment” (CA GOPR 2020b).
- 17 **Fuel Moisture Content:** This is expressed as a percent or fraction of fuel moisture content weight (dry) of
18 fuel. It is the most important fuel property controlling flammability. In living plants, it is physiologically
19 bound. Its daily fluctuations vary considerably by species but are usually above 80 to 100 percent.
20 As plants mature, moisture content decreases. When herbaceous plants cure, their moisture content
21 responds as dead fuel moisture content, which fluctuates according to changes in temperature, humidity,
22 and precipitation (Wooten 2021).
- 23 **Fuel Treatment:** The manipulation or removal of fuels to minimize the probability of ignition and/or to
24 reduce potential damage and resistance to fire suppression activities (NWCG 2021d). Synonymous with
25 fuel modification.
- 26 **Grazing:** There are two types of grazing: (1) traditional grazing, and (2) targeted grazing. Traditional
27 grazing refers to cattle that are managed in extensive pastures to produce meat. Targeted grazing
28 involves having livestock graze at a specific density for a given period of time for the purpose of
29 managing vegetation. Even though both kinds of grazing manage fuel loading in range- and forested
30 lands, targeted grazing is different in that its sole purpose is to manage fuels. Targeted grazing is done by
31 a variety of livestock species such as sheep, goats, or cows (UCANR 2019).
- 32 **Ground Fire:** Fire that burns organic matter in the soil, or humus; usually does not appear at the surface
33 (National Geographic 2021).
- 34 **Ground Fuels:** Fuels that lie beneath surface fuels, such as organic soils, duff, decomposing litter, buried
35 logs, roots, and the below-surface portion of stumps (Wooten 2021).
- 36 **Hazard:** A “hazard” can be defined generally as an event that could cause harm or damage to human
37 health, safety, or property (CA GOPR 2020b).
- 38 **Hazardous Areas:** Those wildland areas where the combination of vegetation, topography, weather, and
39 the threat of fire to life and property create difficult and dangerous problems (SWCA).
- 40 **Hazardous Fuels:** A fuel complex defined by type, arrangement, volume, condition, and location that
41 poses a threat of ignition and resistance to fire suppression (NWCG 2021e).

- 1 **Hazardous Fuels Reduction:** Any strategy that reduces the amount of flammable material in a fire-
2 prone ecosystem. Two common strategies are mechanical thinning and controlled burning (Wooten
3 2021).
- 4 **Hazard Reduction:** Any treatment that reduces the threat of ignition and spread of fire (SWCA).
- 5 **Highly Valued Resources and Assets:** Landscape features that are influenced positively and/or
6 negatively by fire. Resources are naturally occurring, while Assets are human made (Interagency Fuel
7 Treatment Decision Support System [IFTDSS] 2021).
- 8 **Ignition:** The action of setting something on fire or starting to burn (SWCA).
- 9 **Incident:** An occurrence or event, either natural or person-caused, which requires an emergency
10 response to prevent loss of life or damage to property or natural resources (Wooten 2021).
- 11 **Influence Zone:** An area that, with respect to wildland and urban fire, has a set of conditions that
12 facilitate the opportunity for fire to burn from wildland fuels to the home and or structure ignition zone
13 (NWCG 2021f).
- 14 **Initial Attack:** The actions taken by the first resources to arrive at a wildfire to protect lives and property
15 and prevent further extension of the fire (SWCA).
- 16 **Invasive Species:** An introduced, nonnative organism (disease, parasite, plant, or animal) that begins to
17 spread or expand its range from the site of its original introduction and that has the potential to cause
18 harm to the environment, the economy, or to human health (USGS 2021).
- 19 **Ladder Fuels:** Fuels that provide vertical continuity allowing fire to carry from surface fuels into the
20 crowns of trees or shrubs with relative ease (SWCA).
- 21 **Litter:** Recently fallen plant material that is only partially decomposed and is still discernible (SWCA).
- 22 **Local Responsibility Area:** A term specific to California, designating areas where the local government
23 is responsible for wildfire protection. The Local Responsibility Area (LRA) includes incorporated cities,
24 cultivated agricultural lands, and portions of the desert. Local responsibility area fire protection is typically
25 provided by city fire departments, fire protection districts, counties, and by CAL FIRE under contract to
26 local government (CA GOPR 2020b).
- 27 **Manual Treatments:** Felling and piling of fuels done by hand. The volume of material generated from a
28 manual fuel treatment is typically too small to warrant a biomass sale therefore collected material is
29 disposed of by burning or chipping. The work can be performed by either a single individual or a large,
30 organized crew with powered equipment (UCANR 2021a).
- 31 **Mechanized Treatments:** Mechanical treatments pulverize large continuous patches of fuel to reduce the
32 volume and continuity of material. Mechanical treatments can be applied as either mastication or chipping
33 treatments. Both treatments shred woody material, but mastication leaves residue on-site while chipping
34 collects the particles for transportation off site. Similar to hand treatments, mechanical treatments can
35 target specific areas and vegetation while excluding areas of concern. In addition, mechanical treatment
36 is easily scalable to large areas (>30 acres) with little added cost. (UCANR 2021b).
- 37 **Mitigation:** Action that moderates the severity of a fire hazard or risk (SWCA).
- 38 **Mutual Aid:** Assistance in firefighting or investigation by fire agencies, irrespective of jurisdictional
39 boundaries (NWCG 2021f).

1 **Native Revegetation:** The process of replanting and rebuilding the soil of disturbed land (e.g., burned)
2 with native plant species (U.S. Department of Agriculture [USDA] 2005).

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

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

- 8 • Resilient Landscapes
- 9 • Fire Adapted Communities
- 10 • Safe and Effective Wildfire Response

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

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

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

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

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

27 **Resilience:** Resilience is the capacity of any entity – an individual, a community, an organization, or a
28 natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow
29 from a disruptive experience (CA GOPR 2020b).

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

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

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

39 **Slope Percent:** The ratio between the amount of vertical rise of a slope and horizontal distance as
40 expressed in a percent. One hundred feet of rise to 100 feet of horizontal distance equals 100 percent
41 (NWCG 2021i).

- 1 **State Responsibility Area:** A term specific to California, designating areas where the state has financial
2 responsibility for wildland fire protection. Incorporated cities and lands under federal ownership are not
3 included in the SRA. Lands under federal ownership are in the federal responsibility area (CA GOPR
4 2020b).
- 5 **Suppression:** The most aggressive fire protection strategy, it leads to the total extinguishment of a fire
6 (SWCA).
- 7 **Surface Fire:** fire that typically burns only surface litter and undergrowth (National Geographic 2021).
- 8 **Surface Fuel:** Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead
9 branch material, downed logs, bark, tree cones, and low stature living plants (SWCA).
- 10 **Structural Ignitability:** The ability of structures (such as homes or fences) to catch fire (SWCA).
- 11 **Topography:** The arrangement of the natural and artificial physical features of an area (SWCA).
- 12 **Total Fuel Load:** The mass of fuel per unit area that could possibly be consumed in a hypothetical fire of
13 the highest intensity in the driest fuels (Wooten 2021).
- 14 **Tree Crown:** The primary and secondary branches growing out from the main stem, together with twigs
15 and foliage (SWCA).
- 16 **Understory:** Low-growing vegetation (herbaceous, brush or reproduction) growing under a stand of
17 trees. Also, that portion of trees in a forest stand below the overstory (SWCA).
- 18 **Understory Fire:** A fire burning in the understory, more intense than a surface fire with flame lengths of
19 1-3 m (Wooten 2021).
- 20 **Values and Assets at Risk:** The elements of a community or natural area considered valuable by an
21 individual or community that could be negatively impacted by wildfire or wildfire operations. These values
22 can vary by community and can include public and private assets (natural and manmade) -- such as
23 homes, specific structures, water supply, power grids, natural and cultural resources, community
24 infrastructure-- as well as other economic, environmental, and social values (CA GOPR 2020b).
- 25 **Vulnerable Community:** Vulnerable communities experience heightened risk and increased sensitivity to
26 natural hazard and climate change impacts and have less capacity and fewer resources to cope with,
27 adapt to, or recover from the impacts of natural hazards and increasingly severe hazard events because
28 of climate change. These disproportionate effects are caused by physical (built and environmental),
29 social, political, and/ or economic factor(s), which are exacerbated by climate impacts. These factors
30 include, but are not limited to, race, class, sexual orientation and identification, national origin, and
31 income inequality (CA GOPR 2020b).
- 32 **Wildfire:** A “wildfire” can be generally defined as any unplanned fire in a “wildland” area or in the WUI (CA
33 GOPR 2020b).
- 34 **Wildfire Exposure:** During fire suppression activities, an exposure is any area/property that is threatened
35 by the initial fire, but in National Fire Incident Reporting System (NFIRS) a reportable exposure is any fire
36 that is caused by another fire, i.e., a fire resulting from another fire outside that building, structure, or
37 vehicle, or a fire that extends to an outside property from a building, structure, or vehicle (USFA 2020).
- 38 **Wildfire Influence Zone:** A wildland area with susceptible vegetation up to 1.5 miles from the interface or
39 intermix WUI (CA GOPR 2020b).

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

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

4 **Wildland Fuels (aka fuels):** Fuel is the material that is burning. It can be any kind of combustible
5 material, especially petroleum-based products, and wildland fuels. For wildland fire, it is usually live, or
6 dead plant material, but can also include artificial materials such as houses, sheds, fences, pipelines, and
7 trash piles. In terms of vegetation, there are 6 wildland fuel types (Fuel Type: An identifiable association
8 of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause a
9 predictable rate of spread or resistance to control under specified weather conditions.) The 6 wildland fuel
10 types are (NWCG 2021j):

11 5. Grass

12 6. Shrub

13 7. Grass-Shrub

14 8. Timber Litter

15 9. Timber-Understory

16 10. Slash-Blowdown

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

30

1 REFERENCES

- 2 Anderson, D. H., E. A. Catchpole, N. J. De Mestre, and T. Parkes. 1981. Modelling the spread of grass
3 fires. *J. Austral. Math.* 23 (1982), 451-466
- 4 Brown, J.K. 1974. *Handbook for Inventorying Downed Woody Material*. Gen. Tech. Rep. No. GTR-INT-
5 16. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Forest and
6 Range Experiment Station.
- 7 Bureau of Land Management (BLM). 2021. Fuels Management. Available at: [https://www.blm.gov/
8 programs/public-safety-and-fire/fire/aviation](https://www.blm.gov/programs/public-safety-and-fire/fire/aviation). Accessed January 2023.
- 9 Butler, B.W., and Cohen, J.D. 1996. An Analytical Evaluation of Firefighter Safety Zones. 12th Fire and
10 Forest Meteorology Conference, Lorne, Australia, 1996.
- 11 California Air Resources Board (CARB). 2001. Title 17 of the California Code of Regulations: Subchapter
12 2. Smoke Management Guidelines for Agricultural and Prescribed Burning Effective March 14,
13 2001. Available at: [https://www.law.cornell.edu/regulations/california/title-17/division-3/chapter-
14 1/subchapter-2](https://www.law.cornell.edu/regulations/california/title-17/division-3/chapter-1/subchapter-2). Accessed January 2023.
- 15 ———. 2003. Prescribed Burning and Smoke Management. Available at: [https://ww2.arb.ca.gov/smoke-
16 management-programs-and-burn-decisions-other-air-districts](https://ww2.arb.ca.gov/smoke-management-programs-and-burn-decisions-other-air-districts). Accessed January 2023.
- 17 California Department of Conservation. 2019. Post-Fire Debris Flow Facts. Available at:
18 <https://www.conservation.ca.gov/index/Pages/Fact-sheets/Post-Fire-Debris-Flow-Facts.aspx>.
19 Accessed January 2023.
- 20 California Department of Fish and Wildlife (CDFW). 2021. Science: Wildfire Impacts. Available at:
21 <https://wildlife.ca.gov/Science-Institute/Wildfire-Impacts>. Accessed January 2023.
- 22 California Department of Food and Agriculture (CDFA). 2021. Invasive Pest & Diseases. Available at:
23 <https://www.cdfa.ca.gov/invasives/>. Accessed January 2023.
- 24 California Department of Forestry and Fire Protection (CAL FIRE). 2018a. California's Forest and
25 Rangelands 2017 Assessment. Available at: [https://frap.fire.ca.gov/media/4babn5pw/
26 assessment2017.pdf](https://frap.fire.ca.gov/media/4babn5pw/assessment2017.pdf). Accessed January 2023.
- 27 ———. 2018b. Strategic Fire Plan for California. Available at: [https://osfm.fire.ca.gov/media/5590/2018-
28 strategic-fire-plan-approved-08_22_18.pdf](https://osfm.fire.ca.gov/media/5590/2018-strategic-fire-plan-approved-08_22_18.pdf). Accessed January 2023.
- 29 ———. 2019a. Community Wildfire Prevention & Mitigation Report. Available at: [https://www.fire.ca.gov/
30 media/5584/45-day-report-final.pdf](https://www.fire.ca.gov/media/5584/45-day-report-final.pdf). Accessed January 2023.
- 31 ———. 2019b. Post-wildfire Recovery. Available at: [https://www.readyforwildfire.org/post-wildfire/after-a-
32 wildfire/](https://www.readyforwildfire.org/post-wildfire/after-a-wildfire/). Accessed January 2023.
- 33 ———. 2020a. California Cooperative Forest Management Plan. Available at: [https://www.fire.ca.gov/
34 media/pe4fswrg/ca-cooperative-fmp-ada.pdf](https://www.fire.ca.gov/media/pe4fswrg/ca-cooperative-fmp-ada.pdf). Accessed January 2023.
- 35 ———. 2020b. Returning Home After a Wildfire. Available at: [https://www.fire.ca.gov/media/11473/
36 returning-home-after-a-wildfire.pdf](https://www.fire.ca.gov/media/11473/returning-home-after-a-wildfire.pdf). Accessed January 2023.
- 37 ———. 2021a. 2021 Fire Season Outlook. Available at: <https://www.fire.ca.gov/incidents>. Accessed
38 January 2023.

- 1 ———. 2021b. Vegetation Management Program. Available at: [https://www.fire.ca.gov/programs/
2 resource-management/resource-protection-improvement/vegetation-management-program/](https://www.fire.ca.gov/programs/resource-management/resource-protection-improvement/vegetation-management-program/).
3 Accessed January 2023.
- 4 ———. 2022a. Fire Perimeters. Available at: <https://frap.fire.ca.gov/frap-projects/fire-perimeters/>.
5 Accessed January 2023.
- 6 ———. 2022b. 2021 Incident Archive. Available at: <https://www.fire.ca.gov/incidents/2021/>. Accessed
7 January 2023.
- 8 ———. 2022c. 2022/2023 Strategic Fire Plan for the San Bernardino Unit. Available at:
9 <https://osfm.fire.ca.gov/media/ua4bqito/2022-san-bernadino-inyo-mono-unit-fire-plan.pdf>.
10 Accessed January 2023.
- 11 ———. 2022d. Defensible Space. Available at: [https://www.fire.ca.gov/programs/communications/
12 defensible-space-prc-4291/](https://www.fire.ca.gov/programs/communications/defensible-space-prc-4291/). Accessed January 2023.
- 13 California Department of Housing and Community Development. 2018. California's Housing Future:
14 Challenges and Opportunities. Available at: [https://www.hcd.ca.gov/policy-research/plans-
15 reports/docs/sha_final_combined.pdf](https://www.hcd.ca.gov/policy-research/plans-reports/docs/sha_final_combined.pdf). Accessed January 2023.
- 16 California Department of Insurance (CDI). 2021. Claims and Loss management. Available at:
17 <http://www.insurance.ca.gov/01-consumers/140-catastrophes/WildfireAfter.cfm>. Accessed
18 January 2023.
- 19 ———. 2022a. Interagency Wildfire Mitigation Partnership Summary Document. Available at:
20 [https://www.insurance.ca.gov/01-consumers/200-wrr/upload/Wildfire-Mitigation-Partnership-
21 Summary-02142022.pdf](https://www.insurance.ca.gov/01-consumers/200-wrr/upload/Wildfire-Mitigation-Partnership-Summary-02142022.pdf). Accessed January 2023.
- 22 ———. 2022b. Safer from Wildfires. Available at: [https://www.insurance.ca.gov/01-consumers/200-
23 wrr/saferfromwildfires.cfm](https://www.insurance.ca.gov/01-consumers/200-wrr/saferfromwildfires.cfm). Accessed January 2023.
- 24 California Department of Public Health. 2017. Reduce Exposure to Ash When Returning Home After a
25 Fire. Available at: [https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/
26 CDPH%20Document%20Library/ReturnHomeAshGuide.pdf](https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/CDPH%20Document%20Library/ReturnHomeAshGuide.pdf). Accessed January 2023.
- 27 California Department of Water Resources. 2021. Flood Preparedness. Available at: [https://water.ca.gov/
28 What-We-Do/Flood-Preparedness/Flood-Preparedness-Week](https://water.ca.gov/What-We-Do/Flood-Preparedness/Flood-Preparedness-Week). Accessed January 2023.
- 29 ———. 2022. Drought. Available at: <https://water.ca.gov/Water-Basics/Drought>. Accessed January 2023.
- 30 California Fire Safe Council. 2021. Fire Safe Councils. Available at: [https://cafiresafecouncil.org/
31 resources/fire-safe-councils/](https://cafiresafecouncil.org/resources/fire-safe-councils/). Accessed January 2023.
- 32 California Forest Management Task Force (CA FMTF). 2021a. California's Wildfire and forest Resilience
33 Action Plan. Available at: [https://fmtf.fire.ca.gov/media/cjwfpckz/
34 californiawildfireandforestresilienceactionplan.pdf](https://fmtf.fire.ca.gov/media/cjwfpckz/californiawildfireandforestresilienceactionplan.pdf). Accessed January 2023.
- 35 California Forest Pest Council (CFPC). 2020. California Forest Pest Conditions. Available at:
36 https://www.caforestpestcouncil.org/_files/ugd/80da86_5031ef87153f436f90f6e5881baaa715.pdf.
37 Accessed January 2023.
- 38 California Governor's Office of Planning and Research (CA GOPR). 2019. Final Report of the
39 Commission on Catastrophic Wildfire Cost and Recovery. Available at: <https://opr.ca.gov/>

- 1 docs/20190618-Commission_on_Catastrophic_Wildfire_Report_FINAL_for_transmittal.pdf.
2 Accessed January 2023.
- 3 ———. 2020a. Fire Hazard Planning Technical Advisory. Available at: [https://www.opr.ca.gov/docs/
4 20201109-Draft_Wildfire_TA.pdf](https://www.opr.ca.gov/docs/20201109-Draft_Wildfire_TA.pdf). Accessed January 2023.
- 5 ———. 2020b. Fire Hazard Planning Technical Advisory, General Plan Technical Advice Series. 2020
6 Available at: https://www.opr.ca.gov/docs/20201109-Draft_Wildfire_TA.pdf. Accessed January
7 2023.
- 8 ———. 2022. Fire Hazard Planning Technical Advisory. Available at: [https://opr.ca.gov/docs/20220817-
9 Fire_Hazard_Planning_TA.pdf](https://opr.ca.gov/docs/20220817-Fire_Hazard_Planning_TA.pdf). Accessed January 2023.
- 10 California Native Plant Society. n.d. Big Sagebrush. Available at: <https://vegetation.cnps.org/alliance/142>.
11 Accessed February 2023.
- 12 California Office of Emergency Services (CA OES). 2018. 2018 State of California Hazard Mitigation Plan.
13 Available at: [https://www.caloes.ca.gov/wp-content/uploads/002-2018-SHMP_FINAL_ENTIRE-
14 PLAN.pdf](https://www.caloes.ca.gov/wp-content/uploads/002-2018-SHMP_FINAL_ENTIRE-
14 PLAN.pdf). Accessed January 2022.
- 15 California Office of Environmental Health Hazard Assessment. 2019. Forest Tree Mortality. Available at:
16 <https://oehha.ca.gov/epic/impacts-biological-systems/forest-tree-mortality>. Accessed January
17 2023.
- 18 California Office of the Governor. 2020. California, U.S. Forest Service Establish Long-Term Strategy to
19 Manage Forests and Rangelands. Available at: [https://www.gov.ca.gov/2020/08/13/california-u-s-
20 forest-service-establish-shared-long-term-strategy-to-manage-forests-and-rangelands/](https://www.gov.ca.gov/2020/08/13/california-u-s-forest-service-establish-shared-long-term-strategy-to-manage-forests-and-rangelands/). Accessed
21 January 2023.
- 22 California Silver Jackets Team (California SJT). 2019. After Wildfire, A Guide for California Communities.
23 Available at: [http://www.readyforwildfire.org/wp-content/uploads/After-Wildfire-Guide-
24 10JUNE2019_draft_final-ADA-compliant.pdf](http://www.readyforwildfire.org/wp-content/uploads/After-Wildfire-Guide-10JUNE2019_draft_final-ADA-compliant.pdf). Accessed January 2023.
- 25 California Wildfire & Forest Resilience Task Force. 2022. Governor Newsom Signs State Budget Bill.
26 Available at: <https://wildfiretaskforce.org/governor-newsom-signs-state-budget-bill/>. Accessed
27 January 2023.
- 28 Coalition for the Upper South Platte (CUSP). 2016. The Phoenix Guide. Available at: [https://cusp.ws/wp-
29 content/uploads/2016/12/phoenix_guide.pdf](https://cusp.ws/wp-content/uploads/2016/12/phoenix_guide.pdf). Accessed January 2023.
- 30 Congressional Research Service (CRS). 2022. Wildfire Statistics. Available at: [https://sgp.fas.org/crs/
31 misc/IF10244.pdf](https://sgp.fas.org/crs/misc/IF10244.pdf). Accessed January 2023.
- 32 Egan, Dave. 2013. Monitoring- Organizing a Landscape-Scale Forest Restoration Multi-Party Monitoring
33 Program. 38pp. Available at: [https://openknowledge.nau.edu/id/eprint/2501/1/
34 Dubay_C_etal_2013_HandbookBreakingBarriers3.pdf](https://openknowledge.nau.edu/id/eprint/2501/1/Dubay_C_etal_2013_HandbookBreakingBarriers3.pdf). Accessed January 2023.
- 35 Environmental Protection Agency (EPA). 2019. Wildfire Smoke: A Guide for Public Health Officials.
36 Available at: [https://www.airnow.gov/sites/default/files/2021-05/wildfire-smoke-guide-revised-
37 2019.pdf](https://www.airnow.gov/sites/default/files/2021-05/wildfire-smoke-guide-revised-2019.pdf). Accessed January 2023.
- 38 Evans, A., S. Auerbach, L.W. Miller, R. Wood, K. Nystrom, J. Loevner, A. Argon, M. Piccarello,
39 E. Krasilovsky. 2015. Evaluating the Effectiveness of Wildfire Mitigation Activities in the Wildland
40 Urban Interface. Forest Guild, October 2015.

- 1 Federal Emergency Management Agency (FEMA). 2022. Social Vulnerability. Available at:
2 <https://hazards.fema.gov/nri/social-vulnerability>. Accessed January 2023.
- 3 Fire Research and Management Exchange System (FRAMES). 2021. Applied Wildland Fire Behavior
4 Research and Development. Available at: <https://www.frames.gov/applied-fire-behavior/home>.
5 Accessed January 2023.
- 6 Forests and Rangelands. 2006. *A Collaborative Approach for Reducing Wildland Fire Risks to*
7 *Communities and the Environment: 10-Year Strategy Implementation Plan*. Available at:
8 https://www.forestsandrangelands.gov/documents/resources/plan/10-yearstrategyfinal_
9 [dec2006.pdf](https://www.forestsandrangelands.gov/documents/resources/plan/10-yearstrategyfinal_dec2006.pdf). Accessed January 2023.
- 10 ———. 2014. *The National Strategy: The Final Phase in the Development of the National Cohesive*
11 *Wildland Fire Management Strategy*. Available at: [https://www.forestsandrangelands.gov/](https://www.forestsandrangelands.gov/documents/strategy/strategy/CSPHaseIIINationalStrategyApr2014.pdf)
12 [documents/strategy/strategy/CSPHaseIIINationalStrategyApr2014.pdf](https://www.forestsandrangelands.gov/documents/strategy/strategy/CSPHaseIIINationalStrategyApr2014.pdf). Accessed January 2023.
- 13 Forests and Rangelands. 2021. *The National Strategy*. Available at:
14 <https://www.forestsandrangelands.gov/strategy/thestrategy.shtml>. Accessed January 2023.
- 15 Great Basin Unified Air Pollution Control District. n.d. Open Outdoor Burning. Available at:
16 <https://gbuapcd.org/PermittingAndRules/Burning/>. Accessed January 2023.
- 17 Graham, R., S. McCaffrey, and T. Jain. 2004. *Science Basis for Changing Forest Structure to Modify*
18 *Wildfire Behavior and Severity*. Gen. Tech Rep. RMRS-GTR-120. Fort Collins, Colorado:
19 U.S. Department of Agriculture Forest Service, Rocky Mountain Research Station.
- 20 Howald, A., 2000. Plant communities. in: *Sierra East: Edge of the Great Basin*. Genny Smith (ed.).
21 Berkeley: University of California Press. pp. 94-207.
- 22 Interagency Fuel Treatment Decision Support System (IFTDSS). 2021. About Map Values - Highly
23 Valued Resources or Assets (HVRAs). Available at: [https://iftdss.firenet.gov/firenetHelp/](https://iftdss.firenet.gov/firenetHelp/help/pageHelp/content/30-tasks/qwra/mapvalues/hvraabout.htm)
24 [help/pageHelp/content/30-tasks/qwra/mapvalues/hvraabout.htm](https://iftdss.firenet.gov/firenetHelp/help/pageHelp/content/30-tasks/qwra/mapvalues/hvraabout.htm). Accessed January 2023.
- 25 ———. 2022. About Map Values - Highly Valued Resources or Assets (HVRAs). Available at:
26 [https://iftdss.firenet.gov/firenetHelp/help/pageHelp/content/30-tasks/qwra/mapvalues/](https://iftdss.firenet.gov/firenetHelp/help/pageHelp/content/30-tasks/qwra/mapvalues/hvraabout.htm)
27 [hvraabout.htm](https://iftdss.firenet.gov/firenetHelp/help/pageHelp/content/30-tasks/qwra/mapvalues/hvraabout.htm). Accessed January 2023.
- 28 International Association of Fire Chiefs. 2021. Ready, Set, Go! Available at: <http://wildlandfirersg.org/>.
29 Accessed January 2023.
- 30 Iglesias, V., J. K. Balch, and W. R. Travis. 2022. U.S. fires became larger, more frequent, and more
31 widespread in the 2000s. *Science Advances*, Vol 8, Issue 11. [https://doi.org/10.1126/](https://doi.org/10.1126/sciadv.abc0020)
32 [sciadv.abc0020](https://doi.org/10.1126/sciadv.abc0020)
- 33 Inyo County. 2009. Inyo County Community Wildfire Protection Plan. Prepared by Anchor Point Fire
34 Management, Boulder, CO. 181 pp. Available at: [https://www.inyocounty.us/sites/default/](https://www.inyocounty.us/sites/default/files/2019-07/Inyo%20County%20CWPP%20with%20Appendices.pdf)
35 [files/2019-07/Inyo%20County%20CWPP%20with%20Appendices.pdf](https://www.inyocounty.us/sites/default/files/2019-07/Inyo%20County%20CWPP%20with%20Appendices.pdf). Accessed January 2023.
- 36 ———. 2016. Inyo County Emergency Operations Plan. Independence, CA. 230 pp. Available at:
37 [https://www.inyocounty.us/sites/default/files/2019-07/INYO%20COUNTY%202016%20EOP-](https://www.inyocounty.us/sites/default/files/2019-07/INYO%20COUNTY%202016%20EOP-FINAL.pdf)
38 [FINAL.pdf](https://www.inyocounty.us/sites/default/files/2019-07/INYO%20COUNTY%202016%20EOP-FINAL.pdf). Accessed January 2023.

- 1 Inyo County and City of Bishop. 2017. Multi-Jurisdictional Hazard Mitigation Plan. Available at:
2 https://www.inyocounty.us/sites/default/files/2019-07/12292017_InyoCountyMJHMP_
3 [FEMA_wAppendices.pdf](https://www.inyocounty.us/sites/default/files/2019-07/12292017_InyoCountyMJHMP_FEMA_wAppendices.pdf). Accessed January 2023.
- 4 Inyo County OES. n.d. Are you prepared? Available at: [https://www.inyocounty.us/sites/default/](https://www.inyocounty.us/sites/default/files/2019-11/INYO-PREPAREDNESS.pdf)
5 [files/2019-11/INYO-PREPAREDNESS.pdf](https://www.inyocounty.us/sites/default/files/2019-11/INYO-PREPAREDNESS.pdf). Accessed January 2023.
- 6 Inyo County Water Department. 2023. Inyo County Saltcedar Control Program. Available at:
7 <https://www.inyowater.org/projects/saltcedar/>. Accessed January 2023.
- 8 Inyo National Forest, 2019. Land Management Plan for the Inyo National Forest. Pacific Southwest
9 Region. R5-MB-323a. 196 pp. Available at: [https://www.fs.usda.gov/Internet/](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf)
10 [FSE_DOCUMENTS/fseprd664404.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf). Accessed January 2023.
- 11 Kitchen, S. G., P. J. Weisberg, and Z. J. Nelson. 2013. Historic fire frequency in mountain big sagebrush
12 communities of the eastern Great Basin and Colorado Plateau: a comparison of estimates based
13 upon proxy fire scar records and predictions derived from post-fire succession rates. Available at:
14 https://www.firescience.gov/projects/06-3-1-17/project/06-3-1-17_final_report.pdf. Accessed
15 January 2023.
- 16 Long, J.W., F.K. Lake, and R.W. Goode. 2021. The importance of Indigenous cultural burning in forested
17 regions of the Pacific West, USA. *Forest Ecology and Management* 500 (2021):119597, ISSN
18 0378-1127, <https://doi.org/10.1016/j.foreco.2021.119597>.
- 19 Lovreglio R, Meddour-Sahar O, Leone V. 2014. Goat grazing as a wildfire prevention tool: a basic review.
20 *iForest* 7: 260-268. doi: 10.3832/ifer1112-007
- 21 Martinson, Erik J.; Omi, Philip N. 2013. Fuel treatments and fire severity: A meta-analysis. Res. Pap.
22 RMRS-RP-103WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky
23 Mountain Research Station. 38 p.
- 24 McCaffrey, S.M. 2004. Fighting fire with education: what is the best way to reach out to homeowners?
25 *Journal of Forestry* 102:12–19.
- 26 ———. 2020. What motivates Homeowners to Mitigate Fire Risk? Lessons from Social Science
27 [conference presentation]. Bill Lane Center for the American West, Virtual Wildfire Series: Wildfire
28 management during COVID. Available at: <https://www.youtube.com/watch?v=3dmbenV-ZsM>.
29 Accessed January 2023.
- 30 McCaffrey, S.M. and C.S. Olsen. 2012. Research Perspectives on the Public and Fire Management:
31 A Synthesis of Current Social Science on Eight Essential Questions. Northern Research Station
32 GTR -104. Available at: [https://www.firescience.gov/projects/06-4-1-26/project/06-4-1-](https://www.firescience.gov/projects/06-4-1-26/project/06-4-1-26_gtr_nrs104.pdf)
33 [26_gtr_nrs104.pdf](https://www.firescience.gov/projects/06-4-1-26/project/06-4-1-26_gtr_nrs104.pdf). Accessed January 2023.
- 34 National Geographic. 2021. Resource Library, Wildfires. Available at:
35 <https://www.nationalgeographic.org/encyclopedia/wildfires/>. Accessed January 2023.
- 36 National Interagency Fire Center (NIFC). 2021a. Wildland Fire Statistics. Available at:
37 https://www.nifc.gov/fireInfo/fireInfo_stats_totalFires.html. Accessed January 2023.
- 38 ———. 2021b. Suppression Costs. Available at: [https://www.nifc.gov/fire-information/statistics/](https://www.nifc.gov/fire-information/statistics/suppression-costs)
39 [suppression-costs](https://www.nifc.gov/fire-information/statistics/suppression-costs). Accessed January 2023.
- 40 ———. 2021c. About Us. Available at: <https://www.nifc.gov/about-us>. Accessed January 2023.

- 1 ———. 2021d. Wildfire Education. Available at: <https://www.nifc.gov/fire-information/fire-prevention-education-mitigation/wildfire-education>. Accessed January 2023.
- 2
- 3 ———. 2021e. Fire Prevention, Education and Mitigation. Available at: <https://www.nifc.gov/fire-information/fire-prevention-education-mitigation>. Accessed January 2023.
- 4
- 5 ———. 2022. Post Fire Recovery. Available at: <https://www.nifc.gov/programs/post-fire-recovery>.
- 6 Accessed January 2023.
- 7 National Park Service (NPS). 2021. Sequoia and Kings National Parks, Forest Health. Available at:
- 8 <https://www.nps.gov/seki/learn/nature/forest-health-and-climate-change.htm>. Accessed January
- 9 2023.
- 10 National Wildfire Coordinating Group (NWCG). 1998. Fireline Handbook. NWCG Handbook 3. PMS 410-
- 11 1. NFES 0065. Boise: National Interagency Fire Center.
- 12 ———. 2020. Smoke Management Guide for Prescribed Fire. Available at: <https://www.nwcg.gov/sites/default/files/publications/pms420-3.pdf>. Accessed January 2023.
- 13
- 14 ———. 2021a. NWCG Glossary of Wildland Fire, PMS 205, I-Zone. Available at: <https://www.nwcg.gov/term/glossary/i-zone>. Accessed January 2023.
- 15
- 16 ———. 2021b. NWCG Glossary of Wildland Fire, PMS 205, Aspect. Available at: <https://www.nwcg.gov/term/glossary/aspect>. Accessed January 2023.
- 17
- 18 ———. 2021c. NWCG Glossary of Wildland Fire, PMS 205, fuel break. Available at:
- 19 <https://www.nwcg.gov/term/glossary/fuel-break>. Accessed January 2023.
- 20 ———. 2021d. NWCG Glossary of Wildland Fire, PMS 205, fuel treatment. Available at:
- 21 <https://www.nwcg.gov/term/glossary/fuel-treatment>. Accessed January 2023.
- 22 ———. 2021e. NWCG Glossary of Wildland Fire, PMS 205, hazard fuel. Available at:
- 23 <https://www.nwcg.gov/term/glossary/hazard-fuel>. Accessed January 2023.
- 24 ———. 2021f. NWCG Glossary of Wildland Fire, PMS 205, I-Zone. Available at: <https://www.nwcg.gov/term/glossary/i-zone>. Accessed January 2023.
- 25
- 26 ———. 2021g. NWCG Glossary of Wildland Fire, PMS 205, mutual aid. Available at:
- 27 <https://www.nwcg.gov/term/glossary/mutual-aid>. Accessed January 2023.
- 28 ———. 2021h. NWCG Glossary of Wildland Fire, PMS 205, rate of spread. Available at:
- 29 <https://www.nwcg.gov/term/glossary/rate-of-spread>. Accessed January 2023.
- 30 ———. 2021i. NWCG Glossary of Wildland Fire, PMS 205, slope percent. Available at:
- 31 <https://www.nwcg.gov/term/glossary/slope-percent>. Accessed January 2023.
- 32 ———. 2021j. Instructor Guide, S-190 Unit 2: Fuels. Available at: <https://www.nwcg.gov/sites/default/files/training/docs/s-190-ig02.pdf>. Accessed January 2023.
- 33
- 34 New Mexico Future Farmers of America (NM FFA). 2010. Introduction to Wildland Fire Behavior for NM
- 35 Forestry CDE. Available at: http://www.nmffa.org/uploads/4/1/0/7/41075673/wildland_fire_behavior.pdf#:~:text=Wildland%20fuels%20are%20basically%20live%20and%20%20dead%20plant,fire%20behavior%20is%20dependent%20on%20certain%20fuel%20characteristics%3A. Accessed January 2023.
- 36
- 37
- 38

- 1 Ottmar, R., R. Vihnanek, and J. Regelbrugge. 2000. Wildland Fire in Ecosystems: Effects of Fire on
2 Fauna. Vol. 1. Gen. Tech. Rep. RMRS-GTR-42. Ogden, Utah: U.S. Department of Agriculture,
3 Forest Service, Rocky Mountain Research Station.
- 4 Pollet J., and P.N. Omi. 2002 Effect of thinning and prescribed burning on crown fire severity in
5 ponderosa pine forests. *International Journal of Wildland Fire* 11:1–10.
- 6 Powell, D. and H. Klieforth, 2000. Weather and climate. in: *Sierra East: Edge of the Great Basin*. Genny
7 Smith (ed.). Berkeley: University of California Press. pp. 70-93.
- 8 Prichard, S. J., D. L. Peterson, and K. Jacobson. 2010. Fuel treatments reduce the severity of wildfire
9 effects in dry mixed conifer forest, Washington, USA. *NRC Research Press* 40:1615–1626
- 10 Pyne, S.J. 2001. The fires this time, and next. *Science* 294(2):12–17.
- 11 Ready. 2021. Community Emergency Response Team. Available at: <https://www.ready.gov/cert>.
12 Accessed January 2023.
- 13 Rothermel, R.C. 1983. *How to Predict the Spread and Intensity of Forest and Range Fires*. Gen. Tech.
14 Rep. INT-143. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Forest
15 and Range Experiment Station.
- 16 Safford, H.D., Schmidt, D.A., and Carlson, C. H. 2009. Effects of fuel treatments on fire severity in an
17 area of wildland-urban interface, Angora Fire, Lake Tahoe Basin, California. *Forest Ecology and*
18 *Management* 258:773–787.
- 19 Safford, H.D., Stevens, J.T., Merriam, K., Meyer, M.D., and Latimer, A.M. 2012. Fuel treatment
20 effectiveness in California yellow pine and mixed conifer forests. *Forest Ecology and*
21 *Management* 274:17–28; <https://doi.org/10.1016/j.foreco.2012.02.013>.
- 22 Scott, J.H., and R.E. Burgan. 2005. *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use*
23 *with Rothermel's Surface Fire Spread Model*. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins,
24 Colorado: U.S. Department of Agriculture, U.S. Forest Service, Rocky Mountain Research
25 Station.
- 26 Sierra Nevada Conservancy. 2021. 2020 megafires create risks for California's water supply. Available at:
27 <https://sierranevada.ca.gov/2020-megafires-create-risks-for-californias-water-supply/>. Accessed
28 January 2023.
- 29 Society of American Foresters (SAF). 2004. Preparing a Community Wildfire Protection Plan:
30 A Handbook for Wildland Urban Interface Communities. Sponsored by Communities Committee,
31 National Association of Counties, National Association of State Foresters, Society of American
32 Foresters, and Western Governors' Association. Available at:
33 <https://www.forestsandrangelands.gov/documents/resources/communities/cwpphandbook.pdf>.
34 Accessed January 2023.
- 35 Southern California Edison. 2022a. 2022 Wildfire Mitigation Plan Update (Fact Sheet). Available at:
36 [https://download.newsroom.edison.com/create_memory_file/?f_id=620fe9b4b3aed34b1cc770f3&](https://download.newsroom.edison.com/create_memory_file/?f_id=620fe9b4b3aed34b1cc770f3&content_verified=True)
37 [content_verified=True](https://download.newsroom.edison.com/create_memory_file/?f_id=620fe9b4b3aed34b1cc770f3&content_verified=True). Accessed January 2023.
- 38 Southern California Edison. 2022b. Wildfire Mitigation Plan. Available at: [https://www.sce.com/sites/](https://www.sce.com/sites/default/files/custom-files/SCE%202022%20WMP%20Update.pdf)
39 [default/files/custom-files/SCE%202022%20WMP%20Update.pdf](https://www.sce.com/sites/default/files/custom-files/SCE%202022%20WMP%20Update.pdf)
40 [https://www.sce.com/sites/default/files/custom-files/SCE 2022 WMP Update.pdf](https://www.sce.com/sites/default/files/custom-files/SCE%202022%20WMP%20Update.pdf). Accessed
41 January 2023.

- 1 State of California. 2022. California Drought Update. Available at: [https://drought.ca.gov/media/](https://drought.ca.gov/media/2022/03/CA-Drought-Update-2-28-22.pdf)
2 [2022/03/CA-Drought-Update-2-28-22.pdf](https://drought.ca.gov/media/2022/03/CA-Drought-Update-2-28-22.pdf). Accessed January 2023.
- 3 Stephens, S.L., and L.W. Ruth. 2005. Federal forest-fire policy in the United States. *Ecological*
4 *Applications* 15(2):532–542.
- 5 Switzer, R. and J. Umek., 2022. Eastern Sierra Nevada Riparian Areas Assessment for Fuels Reduction.
6 Reno: Great Basin Institute. 163 p.
- 7 Team Rubicon. 2022. Capabilities and Services. Available at: [https://teamrubiconusa.org/capabilities-](https://teamrubiconusa.org/capabilities-services/)
8 [services/](https://teamrubiconusa.org/capabilities-services/). Accessed January 2023.
- 9 U.S. Department of Agriculture (USDA). 2001. Urban Wildland Interface Communities within Vicinity of
10 Federal Lands that are at High Risk from Wildfire. Federal Register 66(3):751–777.
- 11 ———. 2005. Terminology and Definitions Associated with Revegetation. Available at:
12 <https://www.nrcs.usda.gov/plant-materials/publications/search>. Accessed January 2023.
- 13 ———. 2022. Introduced, Invasive, and Noxious Plants. Available at: [https://plantsorig.sc.egov.usda.gov/](https://plantsorig.sc.egov.usda.gov/java/noxiousDriver)
14 [java/noxiousDriver](https://plantsorig.sc.egov.usda.gov/java/noxiousDriver). Accessed January 2023.
- 15 U.S. Fire Administration (USFA). 2020. Exposures. Available at: [https://www.usfa.fema.gov/nfirs/coding-](https://www.usfa.fema.gov/nfirs/coding-help/nfirsgrams/nfirsgram-including-exposures.html)
16 [help/nfirsgrams/nfirsgram-including-exposures.html](https://www.usfa.fema.gov/nfirs/coding-help/nfirsgrams/nfirsgram-including-exposures.html). Accessed January 2023.
- 17 ———. 2021a. What is the WUI? Available at: <https://www.usfa.fema.gov/wui/what-is-the-wui.html>.
18 Accessed January 2023.
- 19 ———. 2021b. Fire-Adapted Communities. Available at: <https://www.usfa.fema.gov/wui/communities/>.
20 Accessed January 2023.
- 21 U.S. Fish and Wildlife Service. N.d. Information for Planning and Consultation Tool. Available at:
22 [https://ipac.ecosphere.fws.gov/location/FBTDVX7ZNAJBFV7Y4ZMQCMKEM/resources#endan-](https://ipac.ecosphere.fws.gov/location/FBTDVX7ZNAJBFV7Y4ZMQCMKEM/resources#endangered-species)
23 [gered-species](https://ipac.ecosphere.fws.gov/location/FBTDVX7ZNAJBFV7Y4ZMQCMKEM/resources#endangered-species). Accessed January 2023.
- 24 U.S. Forest Service (USFS). 2014. Using Resistance and Resilience Concepts to Reduce Impacts of
25 Invasive Annual Grasses and Altered Fire Regimes on the Sagebrush Ecosystem and Greater
26 Sage-Grouse: A Strategic Multi-Scale Approach. Available at: [https://agsci.oregonstate.edu/sites/](https://agsci.oregonstate.edu/sites/agscid7/files/eoarc/attachments/824_using_resistance_resilience_2014.pdf)
27 [agscid7/files/eoarc/attachments/824_using_resistance_resilience_2014.pdf](https://agsci.oregonstate.edu/sites/agscid7/files/eoarc/attachments/824_using_resistance_resilience_2014.pdf). Accessed January
28 2023.
- 29 ———. 2018a. Land Management Plan for the Inyo National Forest. Available at:
30 https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf. Accessed January 2023.
- 31 ———. 2018b. Final Environmental Impact Statement for Revision of the Inyo National Forest Land
32 Management Plan. Available at: [https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589660.pdf)
33 [fseprd589660.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589660.pdf). Accessed January 2023.
- 34 ———. 2021a. Fire Terminology. Available at: [https://www.nwcg.gov/sites/default/files/data-standards/](https://www.nwcg.gov/sites/default/files/data-standards/glossary/pms205.pdf)
35 [glossary/pms205.pdf](https://www.nwcg.gov/sites/default/files/data-standards/glossary/pms205.pdf). Accessed January 2023.
- 36 ———. 2021b. Leadership and National Priorities. Available at: [https://www.fs.usda.gov/inside-fs/](https://www.fs.usda.gov/inside-fs/delivering-mission/excel/leadership-intentions-usda-forest-services-five-national#:~:text=The%20Forest%20Service's%20five%20national%20priorities%20do%20three,work%20with%20citizens%2C%20partners%2C%20volunteers%20and%20each%20other)
37 [delivering-mission/excel/leadership-intentions-usda-forest-services-five-national#:~:text=](https://www.fs.usda.gov/inside-fs/delivering-mission/excel/leadership-intentions-usda-forest-services-five-national#:~:text=The%20Forest%20Service's%20five%20national%20priorities%20do%20three,work%20with%20citizens%2C%20partners%2C%20volunteers%20and%20each%20other)
38 [The%20Forest%20Service's%20five%20national%20priorities%20do%20three,work%20with%20](https://www.fs.usda.gov/inside-fs/delivering-mission/excel/leadership-intentions-usda-forest-services-five-national#:~:text=The%20Forest%20Service's%20five%20national%20priorities%20do%20three,work%20with%20citizens%2C%20partners%2C%20volunteers%20and%20each%20other)
39 [citizens%2C%20partners%2C%20volunteers%20and%20each%20other](https://www.fs.usda.gov/inside-fs/delivering-mission/excel/leadership-intentions-usda-forest-services-five-national#:~:text=The%20Forest%20Service's%20five%20national%20priorities%20do%20three,work%20with%20citizens%2C%20partners%2C%20volunteers%20and%20each%20other). Accessed January
40 2023.

- 1 ———. 2021c. 2021 Aerial Detection Survey Results: California. Available at: [https://www.fs.usda.gov/](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd999359.pdf)
2 Internet/FSE_DOCUMENTS/fseprd999359.pdf. Accessed January 2023.
- 3 ———. 2021d. Postfire Restoration Framework for National Forests in California. Available at:
4 https://www.fs.usda.gov/psw/publications/documents/psw_gtr270/psw_gtr270.pdf. Accessed
5 January 2023.
- 6 ———. 2021e. After the Fire. Available at: <https://www.fs.usda.gov/science-technology/fire/after-fire>.
7 Accessed January 2023.
- 8 U.S. Geological Survey (USGS). 2021. What is an invasive species and why are they a problem?
9 Available at: [https://www.usgs.gov/faqs/what-invasive-species-and-why-are-they-a-problem?qt-](https://www.usgs.gov/faqs/what-invasive-species-and-why-are-they-a-problem?qt-news_science_products=0#qt-news_science_products)
10 [news_science_products=0#qt-news_science_products](https://www.usgs.gov/faqs/what-invasive-species-and-why-are-they-a-problem?qt-news_science_products=0#qt-news_science_products). Accessed January 2023.
- 11 University of California, Agriculture and Natural Resources (UCANR). 2009. Invasive Plants and Wildfires
12 in Southern California. Available at: <https://anrcatalog.ucanr.edu/pdf/8397.pdf>. Accessed January
13 2023.
- 14 ———. 2017. Tree Mortality in the Sierra Nevada. Available at: [https://ucanr.edu/sites/](https://ucanr.edu/sites/CentralSierraForestry/files/331959.pdf)
15 [CentralSierraForestry/files/331959.pdf](https://ucanr.edu/sites/CentralSierraForestry/files/331959.pdf). Accessed January 2023.
- 16 ———. 2019. Grazing for fire fuels management. Available at: [https://ucanr.edu/blogs/blogcore/](https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=31445)
17 [postdetail.cfm?postnum=31445](https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=31445). Accessed January 2023.
- 18 ———. 2020. Mass Tree Mortality, Fuels, and Fire: A Guide for Sierra Nevada Forest Landowners.
19 Available at: <https://anrcatalog.ucanr.edu/pdf/8683.pdf>. Accessed January 2023.
- 20 ———. 2021a. Manual. Available at: <https://ucanr.edu/sites/fire/Prepare/Treatment/Manual/>. Accessed
21 January 2023.
- 22 ———. 2021b. Mechanical. Available at: <https://ucanr.edu/sites/fire/Prepare/Treatment/Mechanical/>.
23 Accessed January 2023.
- 24 Waltz, A.E.M., M.T. Stoddard, E.L. Kalies, J.D. Springer, D.W. Huffman, and A.S. Meador. 2014.
25 Effectiveness of fuel reduction treatments: Assessing metrics of forest resiliency and wildfire
26 severity after the Wallow Fire, AZ. *Forest Ecology and Management* 334:43-52;
27 <https://doi.org/10.1016/j.foreco.2014.08.026>.
- 28 Wayman, R. B., and H.D. Safford. 2021. Recent bark beetle outbreaks influence wildfire severity in
29 mixed-conifer forests of the Sierra Nevada, California, USA. *Ecological Applications* 31(3):
30 e02287. 10.1002/eap.2287
- 31 Webb, A. D., D.A. Falk, M.D. Finch. 2019. Fire Ecology and Management in Lowland Riparian
32 Ecosystems of the Southwestern United States and Northern Mexico. Gen. Tech. Rep. RMRS-
33 GTR-401. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain
34 Research Station
- 35 Westerling, A.L., H.G. Hidalgo, D.R. Cayan, and T.W. Swetnam. 2006. Warming and earlier spring
36 increase in western U.S. Forest wildfire activity. *Science* 313(5789):940–943.
- 37 Westerling. 2016. Increasing western US forest wildfire activity: sensitivity to changes in the timing of
38 spring. Available at: http://ulmo.ucmerced.edu/pdf/files/16RSTB_Westerling.pdf. Accessed
39 January 2023.

- 1 Western Regional Climate Center. 2022. Independence, California. Available at: [https://wrcc.dri.edu/cgi-](https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca4232)
2 [bin/cliMAIN.pl?ca4232](https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca4232). Accessed January 2023.
- 3 Western Regional Strategy Committee (WRSC). 2013. Western Regional Action Plan. Available at:
4 [https://www.forestsandangelands.gov/documents/strategy/rsc/west/WestRAP_](https://www.forestsandangelands.gov/documents/strategy/rsc/west/WestRAP_Final20130416.pdf)
5 [Final20130416.pdf](https://www.forestsandangelands.gov/documents/strategy/rsc/west/WestRAP_Final20130416.pdf). Accessed January 2023.
- 6 Wildland Fire Decision Support System (WFDSS). 2015. WFDSS Spatial Fire Planning Guide. October
7 2015. Available at: https://wfdss.usgs.gov/wfdss/pdfs/WFDSS_SFP_Guide.pdf. Accessed
8 January 2023.
- 9 ———. 2021. Wildland Fire Decision Support System. Available at: [https://wfdss.usgs.gov/wfdss/](https://wfdss.usgs.gov/wfdss/wfdss_home.shtml)
10 [wfdss_home.shtml](https://wfdss.usgs.gov/wfdss/wfdss_home.shtml). Accessed January 2023.
- 11 Winter, G., and J.S. Fried. 2000. Homeowner perspectives on fire hazard, responsibility, and
12 management strategies at the wildland-urban interface. *Society and Natural Resources* 13:33–49.
- 13 Wooten, George. 2021. Fire and fuels management: Fire and fuels management: Definitions, ambiguous
14 terminology and references. Available at: [https://www.nps.gov/olymp/learn/management/upload/](https://www.nps.gov/olymp/learn/management/upload/fire-wildfire-definitions-2.pdf)
15 [fire-wildfire-definitions-2.pdf](https://www.nps.gov/olymp/learn/management/upload/fire-wildfire-definitions-2.pdf). Accessed January 2023.

AWCA

APPENDIX A:

CWPP Planning Process and Background

This page intentionally left blank.

1 PLANNING PROCESS

2 The SAF, in collaboration with the National Association of Counties and the National Association of State
3 Foresters, developed a guide entitled *Preparing a Community Wildfire Protection Plan: A Handbook for*
4 *Wildland-Urban Interface Communities* (SAF 2004) to provide communities with a clear process in
5 developing a CWPP. The guide outlines eight steps for developing a CWPP and has been followed in
6 preparing the 40 Acres CWPP:

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

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

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

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

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

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

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

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

33 FIRE MANAGEMENT POLICY

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

1 LEGISLATIVE DIRECTION

2 Municipal Direction

3 Codes & Ordinances

4 40 Acres falls within Inyo County and therefore operates based on the Inyo County Code. Inyo County
5 has a *Defensible space and fire hazard reduction* section under *Title 14 Building and Safety*, which
6 designates all of the unincorporated areas as WUI and requires that properties in the WUI to be
7 “maintained in accordance with the defensible space requirements set forth in Government Code Section
8 51182 and Public Resources Code Section 4291.” You can find more information about this requirement
9 here: [https://library.qcode.us/lib/inyo_county_ca/pub/county_code/item/title_14-chapter_14_08-
10 14_08_140](https://library.qcode.us/lib/inyo_county_ca/pub/county_code/item/title_14-chapter_14_08-14_08_140)

11 Additionally, Inyo County has two ordinances regarding “combustible waste materials” and their removal
12 under Title 7: *7.36.040 Fire hazard—Removal—Required* and *7.36.050 Fire hazard—Removal—By city*.
13 These ordinances require the full or partial removal of combustible materials that may pose a fire hazard.
14 In the event of noncompliance, the County may enter the noncompliant premises and remove the
15 combustible material and the owner shall be liable for expenses. You can find more information about
16 these ordinances here: [https://library.qcode.us/lib/inyo_county_ca/pub/county_code/item/title_7-
17 chapter_7_36](https://library.qcode.us/lib/inyo_county_ca/pub/county_code/item/title_7-chapter_7_36)

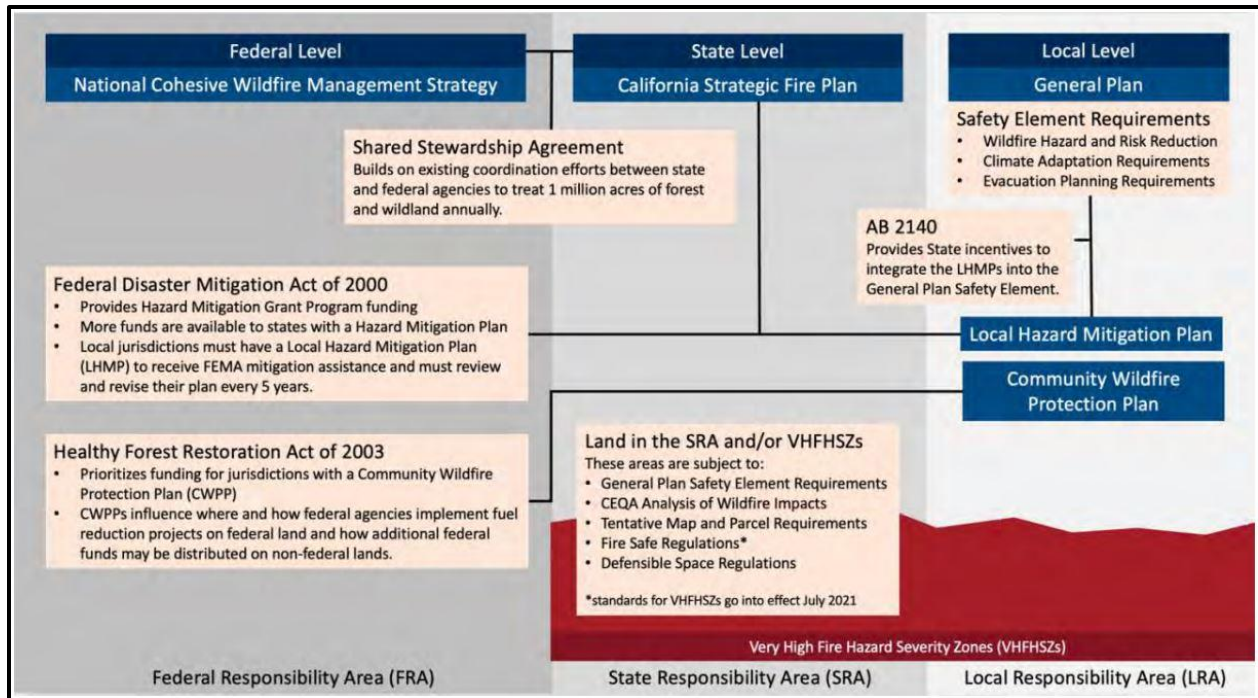
18 State Direction

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

- 24 11. **Increase Fuel Breaks:** Reduce the risk of wildfire and slow fire spread within the WUI.
- 25 12. **Protect Wildfire-Prone homes and Neighborhoods:** Expand and extend defensible space
26 programs.
- 27 13. **Improve Utility related wildfire risk:** Ensure electrical corporations are compliant with wildfire
28 regulations.
- 29 14. **Create Fire-Safe Roadways:** Ensuring emergency evacuation routes that can function as a fuel
30 break.

31 Like the 2014 national strategy, California’s 2019 Strategic Plan, California’s Wildfire and Forest
32 Resilience Action Plan, and Federal Emergency Management Agency (FEMA) Disaster Mitigation Act of
33 2000, all mandate community-based planning efforts with full stakeholder participation, coordination,
34 project identification, prioritization, funding review, and multiagency cooperation. In compliance with Title
35 1 of the HFRA, a CWPP must be mutually agreed upon by the local government, local fire departments,
36 and the state agency responsible for forest management. As outlined in HFRA, this CWPP is developed
37 in consultation with interested parties and the federal agencies managing land surrounding the at-risk
38 communities. See Figure A.1 for an overview of California’s wildfire regulatory environment.

39



1
2 **Figure A.1. California's wildfire regulatory framework. Source: California Governor's Office of**
3 **Planning and Research (CA GOPR 2022).**

4 California Bills and Regulations

5 **Assembly Bill 179:** In September of 2022, Governor Newsom signed budget bill AB 179 authorizing
6 \$1.3 billion dollars over the next two years to build wildfire resilience and bolster forest health throughout
7 the state. The bill allocates \$472 million dollars toward forest health and fire prevention planning,
8 \$130 million toward state-owned land stewardship, \$50 million for post-fire reforestation, \$170 million for
9 state conservancy forest health projects, \$70 million for fire crews and prescribed burning activities,
10 \$40 million for the Regional Forest and Fire Capacity Program, \$30 million for workforce development,
11 and \$25 million to assist small landowners (California Wildfire & Forest Resilience Task Force 2022).
12 This plan is part of the governor's Wildfire and Forest Resilience Action plan which aims to increase and
13 expedite forest health projects to sustain and protect communities and meet economic and environmental
14 goals (Department of Water Resources 2021).

15 **Assembly Bill 1823:** The Bill requires that on or before July 1, 2022, the State Board of Forestry and Fire
16 Protection develop criteria for and maintain a "Fire Risk Reduction Community" list of local agencies
17 located in a State Responsibility Area (SRA) or a very high hazard severity zone that meet best practices
18 for local fire planning. The existing law requires the State board to consider specific factors when
19 developing the criteria for the list, including recently developed or updated community wildfire protection
20 plans (CWPPs) (CA GOPR 2022). This CWPP is in alignment with the requirement stipulated by
21 Assembly Bill (AB) 1823 (2019).

22 **Senate Bill 1241:** Senate Bill 1241 (2012) revised the safety element stipulations in State law to instruct
23 all cities and counties whose planning area is within the SRA or a very high fire hazard severity zone to
24 address and include specific information concerning wildfire hazards and risk, and strategies and policies
25 to address and minimize unreasonable risks associated with wildfire. The specific requirements are
26 codified in chapter 311 of the Bill. As a result, CAL FIRE maintains fire hazard severity zone maps and

1 data for the entire State. Three classes of fire hazard severity classifications exist: moderate, high, and
2 very high. Fire hazard severity considers the amount of vegetation, temperature, wind, humidity, and
3 topography, and represents the likelihood of an area burning over a 30 to 50-year interval (CA GOPR
4 2022).

5 **Senate Bill 379:** Senate Bill 379 (2015) amended Government Code Section 65302(g)(4) to require that
6 all general plans in California address climate change adaptation and resilience as part of the safety
7 portion of the plan. This amendment requires local jurisdictions to add this change as part of the next
8 revision to their local hazard mitigation plan or, if a local hazard mitigation plan has not been adopted, the
9 safety element must be reviewed and updated to include applicable climate adaptation and resilience
10 strategies (CA GOPR 2022). This CWPP may be integrated into the Safety Element of the City General
11 Plan during the next scheduled revision.

12 **Senate Bill 246:** As established by Senate Bill 246 in 2015, the Integrated Climate Adaptation and
13 Resiliency Program (ICARP) is the leading program responsible for coordinating response to climate
14 change impacts on a local, regional, and state scale. ICARP utilizes the Adaptation Clearing House,
15 an online database of climate resources, and coordinates with the Technical Advisory Council to aid in
16 facilitation of resiliency efforts. CA GOPR recommends that climate change–related safety updates be
17 made in alignment with ICARP vision, principals, definitions, and wildfire requirements where applicable
18 (CA GOPR 2022).

19 **Senate Bill 901:** Senate Bill 901 (2018) requires the State Board to regularly update regulations for fuel
20 breaks and greenbelts close to communities to enhance fire safety within the State Responsibility Area or
21 areas designated as Very High Fire Hazard Severity Zones. The Bill also requires that the updated
22 regulations include measures to maintain undeveloped ridgelines to minimize fire risk and enhance fire
23 protection (CA GOPR 2022).

24 **PRC 4290:** Public Resources Code Section 4290 confers the State Board with the authority to adopt
25 regulations for base level fire safety standards with respect to State Responsibility lands and to lands
26 designated as Very High Fire Hazard Severity Zone. The fire safety standards address multiple issues,
27 including fuel modification standards for fuel breaks and greenbelts; road and driveway standards for
28 emergency response access and public evacuation; minimum private water supply reserves for fire
29 suppression; and standards for street, road, and building signage. However, these standards do not
30 replace local regulations that meet or exceed minimum requirements adopted by the State Board
31 (CA GOPR 2022).

32 **PRC Section 4291:** Public Resources Code Section 4291 details mandatory defensible space
33 requirements for any person who owns, leases, controls, operates, or maintains a building in an SRA or
34 very high FHSZ within a Local Responsibility Area (LRA). The requirements include, but are not limited to,
35 100 feet of defensible space around homes, removal of vegetation debris from the perimeter and the roof
36 of homes/structures, and removal of vegetation from chimneys or stovepipes. This code was updated in
37 January 2021 to require an ember-resistant zone within 5 feet of a home/structure on or before January 1,
38 2023 (CA GOPR 2022).

39 **Assembly Bill 38:** Assembly Bill 38 (2019) amended sections of the Civil, Government, and Public
40 Resources Codes to set forth a comprehensive wildfire mitigation financial support program, which
41 facilitates cost-effective home/structure hardening and retrofitting to create fire-resistant homes,
42 businesses, and public structures. The amendments require the State Fire Marshal, in consultation with
43 the Director of Forestry and Fire Protection and the Director of Housing and Community Development, to
44 identify building retrofits and hardening measures eligible for financial assistance under the program.
45 Additionally, the amendments require that CAL FIRE identify defensible space, vegetation management,

1 and fuel treatment procedures eligible for financial assistance. Wildfire hazard areas eligible for financial
2 assistance under the program include LRAs situated within very high FHSZs and SRAs within any FHSZ
3 (CA GOPR 2022).

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

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

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

24 Federal Direction

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

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

1 the development of Community Wildfire Protection Plans (CWPPs), which facilitate the collaboration
2 between federal agencies and communities to develop hazardous fuels reduction projects and place
3 priority on treatment areas identified by communities in a CWPP.

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

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

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

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

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

22 PAST PLANNING EFFORTS

23 Local

24 There are several existing documents relating to fire management in the Planning Area. This CWPP is
25 meant to supplement and not replace any other existing plans.

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

32 **Inyo County General Plan:** Inyo County last completed a comprehensive update of its General Plan in
33 2001 in compliance with state law (Government Code 65300). The General Plan is a comprehensive
34 guidance document that directs future physical development throughout the county (Inyo County, 2001).
35 The General Plan addresses seven mandatory topics. Included in these topics is the safety topic, which
36 establishes policies to protect the public from risks associated with natural and human-caused hazards,
37 e.g., wildfire hazards. Inyo County provides annual progress reports about updates and amendments to
38 the plan on the planning department's section of the county website:

39 <https://www.inyocounty.us/services/planning-department/inyo-county-general-plan>

1 **Inyo County Community Wildfire Protection Plan:** A CWPP was prepared for the entire county in 2009
2 by Anchor Point Group consultants. This plan (Inyo County 2009) assesses the wildfire hazard throughout
3 the county, provides some recommendations for reducing the risks, and outlines a range of fuels
4 modification projects, including a fuelbreak for 40 Acres. The plan's assessment of risk at the community
5 level rated 40 Acres at a "very high" hazard rating, one of only four communities in the county with that
6 high of a hazard rating (Inyo County 2009: B-14 & B-15). The 2023 40 Acres CWPP is much more
7 detailed with respect to its focus on a single community.

8 **Inyo County Multi-Jurisdictional Local Hazard Mitigation Plan:** In 2017, Inyo County adopted—and
9 FEMA approved—the Inyo County / City of Bishop Multi-Jurisdictional Hazard Mitigation Plan. The
10 purpose of this plan is to assess human-caused and natural risks to communities throughout Inyo County,
11 and to reduce the potential effects of the hazards by establishing mitigation strategies (Inyo County
12 2017). Community and hazard profiles; hazard identification, analysis, and assessments; risk
13 assessments; mitigation and adaptation strategies; and monitoring procedures are all outlined within the
14 plan. In addition, the plan also provides hazard analysis and characterization and some generalized
15 mitigation strategies regarding wildfire.

16 Inyo County has mapped the fire hazard for 40 Acres and surrounding lands as "high."
17 <https://gis.inyoco.com/arcgis/apps/webappviewer/index.html?id=381b793851de485f89f2fef2cf9d2f15>

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

22 **CAL FIRE San Bernardino Unit Strategic Fire Plan:** The CAL FIRE San Bernardino Unit (BDU) is
23 comprised of San Bernardino, Inyo, and Mono counties. Inyo County is served by the Owens Valley
24 Battalion, which operates one fire engine crew out of the Bishop Station at 2781 South Round Valley
25 Road and a second BDU fire engine crew out of its Independence Station at 250 E. Park St. The nearby
26 Owens Valley Conservation Camp has five type 1 hand crews and one dozer. A program for defensible
27 space inspections assists homeowners comply with the requirements of section 4291 of the California
28 Public Resource Code. This recently updated strategic fire plan outlines a variety of fire prevention
29 programs and projects (CAL FIRE 2022c).

30 **Southern California Edison Wildfire Mitigation Plan:** Although SCE has limited presence in 40 Acres,
31 they have an active wildfire mitigation program for their utility infrastructure. In 2022, SCE updated their
32 Plan to provide an updated risk assessment, lessons learned in 2021, and to highlight actions taken in
33 2021 to reduce ignition from SCE infrastructure. The plan has an overarching goal of reducing SCE
34 equipment related ignitions (southern California Edison, 2022a). To achieve this goal, SCE has identified
35 actionable objectives that include increasing system hardening, bolstering situational awareness, and
36 enhancing operational practices. The plan includes a table of 2022 targets to achieve these objectives.
37 Examples of 2022 targets include installing 150 weathers stations, undergrounding 13 miles of power
38 lines in high fire risk areas, and replacing circuits, relays, and fuses in targeted areas (Southern California
39 Edison, 2022a). Additionally, to reduce wildfire risk and improve incident response, SCE is expanding
40 their detection and modeling efforts, investing in suppression resources, and developing fault detection
41 mechanisms. SCE has a vegetation management program to inspect and remove hazardous and dying
42 trees, and clear brush at the base of poles (Southern California Edison 2022b). The WMP provides
43 detailed information on SCE's risk assessment including equipment inventory, weather and wildlife event
44 mapping, and vulnerable communities.

1 State

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

8 **California State Hazard Mitigation Plan:** In 2018 the California Office of Emergency Services (CA OES)
9 released the latest California State Hazard Mitigation Plan. The intention of the plan was to provide a
10 current update of all past and potential hazards and disasters within California and outline mitigation
11 strategies, risk reduction methods, goals, objectives, strategies, and priorities (CA OES 2018). Mitigation
12 strategies recommended include strengthening interagency coordination, incorporating climate change
13 into future planning efforts, and establishing a mitigation registry (CA OES 2018).

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

24 **Wildland Urban Interface Planning Guide:** In 2022, in accordance with the requirements of AB 75, the
25 California Governor's Office of Planning and Research, with the Community Wildfire Planning Center and
26 CALFIRE, created the WUI planning guide to provide recommendations and examples to aid
27 communities in planning for living in the WUI (CA GOPR 2022). The guide serves as a supplement to the
28 Fire Hazard Planning Technical Advisory and discusses several plan categories, detailing their respective
29 purpose, and how they relate to WUI planning. Some plan types referenced include, general, hazard,
30 climate, and wildfire plans. The regulation section of the guide provides required and recommended
31 codes for resilient WUI planning and rationale for how these measures promote a fire safe community.
32 Additional tools and programs that enhance community resilience are detailed in the plan (CA GOPR
33 2022).

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

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

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

9 **California's Wildfire and Forest Resilience Action Plan:** In 2021 the California Forest Management
10 Task Force (CA FMTF) developed California's Wildfire and Forest Resilience Action Plan (CA FMTF
11 2021a). The purpose of the plan was to sustain economic strength of the forests, improve forest health
12 and resilience, and increase the level of fire safety within communities. The plan is broken up into four
13 major goals and strategies to achieve said goals (CA FMTF 2021a). The goals include increasing the
14 pace and scale of forest health projects, strengthening the protection of communities, managing the forest
15 to achieve the state's economic and environmental goals, and driving innovation while measuring
16 progress. Strategies for increasing community fire safety include increasing fuel breaks, creating fire-safe
17 roadways, and supporting community risk reduction (CA FMTF 2021a).

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

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

32 **Safer from Wildfire Initiative:** This partnership program was established to increase home hardening
33 and defensible space efforts on homes that were not built to current CAL FIRE Standards. The program
34 was developed in a partnership with the California Office of Emergency Services, Planning and Research,
35 Department of Insurance, Public Utilities Commission, and CAL FIRE to create pathways for more
36 accessible home insurance by requiring insurers to reward safety and mitigation actions (Colorado
37 Department of Insurance [CDI], 2022a). The program works within the three mitigation topics of Protecting
38 the Structure, Protecting the Surroundings, and Working as a Community to identify actionable steps to
39 improving community resilience in a cost-effective way. Each topic has specific measures, such as
40 upgrading to ember resistant vents, clearing under deck vegetation, or working as a community to
41 achieve a Firewise rating (CDI 2022a). The list of actions creates consistency in home hardening. This
42 program has been used to negotiate insurance discounts for individuals and communities based on
43 mitigation achievements at each level. For example, State Farm offers a discount to communities that
44 achieve a Firewise Community rating (CDI 2022b). More information about the Safer from Wildfires
45 initiative and currently available insurance discounts are available at the following URL: [Safer from
46 Wildfires \(ca.gov\)](https://www.firewise.com/safer-from-wildfires)

1 Federal

2 U.S Forest Service

3 The guiding document is the Land Management Plan for the Inyo National Forest (Inyo National Forest
4 2019). This Plan satisfies the National Land Management Act of 1976 and directs all fire management
5 activities in the forest, among other things. The “strategic fire management zones” section of chapter 3
6 and the fire-related actions in appendix B are the most relevant parts of the plan to this CWPP. The Inyo
7 National Forest and BLM Bishop Field Office collaborate through an Interagency Fire Organization.

8 Bureau of Land Management

9 The BLM Bishop Field Office has a general fire management plan, prepared in 2004, according to a
10 citation in a LADWP report. However, a public copy of the document is not available. In general, the BLM
11 collaborates with several federal, state, and local organizations to develop and implement wildland fire
12 programs. For instance, the BLM’s fuels management program directs a wide range of active
13 management vegetation treatments using mechanical, biological, and chemical tools, and prescribed fire.
14 The program consists of creating fuel breaks, reducing fuel loads, reducing fire risk near communities,
15 targeted grazing, and herbicide to break fire-grass cycles. Fuels treatments are planned and implemented
16 jointly with other BLM programs, and with federal, state, local, and non-governmental collaborators
17 (BLM 2021). The BLM Bishop Field Office last updated its Resource Management Plan in 1993.

18 PUBLIC LAND MANAGEMENT

19 LAND MANAGEMENT STRATEGIES

20 In 2020, California and the Federal government signed an agreement of the shared stewardship for
21 California forests and rangelands. The agreement sets many goals for the state of California and the
22 Federal government to accomplish together (CA Office of the Governor 2020). These goals include:
23 treating at least 1 million acres of California lands per year to reduce the risk of wildfires, developing a
24 20-year cooperative forest management plan which will outline projects and priorities, encouraging and
25 increasing the use of sustainable land management practices such as prescribed fire, increase the forest
26 management workforce and in turn increase the pace and scale of forest management, and prioritizing
27 forest health benefits such as carbon sequestration and healthy watersheds. Funding for this agreement
28 will be provided from The Great American Outdoors Act (CA Office of the Governor 2020).

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

34 State Land

35 State Responsibility Area (SRA) is a legal term defining the area where the State has financial
36 responsibility for the prevention and suppression of wildfire. 40 Acres is within the SRA and is adjacent to
37 the Federal Responsibility Area on the western side.

1 In California, CAL FIRE maintains fire hazard severity zone (FHSZ) data for the entire state. There are
2 three classes of fire hazard severity ratings within FHSZs: Moderate, High, and Very High (CA GOPR
3 2020). Fire hazard severity zones are defined based on vegetation, topography, and weather, and
4 represent the probability of the area burning and potential fire behavior in the area. 40 Acres is currently
5 mapped as a high FHSZ (<https://egis.fire.ca.gov/FHSZ/>). The mapping is being revised during 2023
6 (<https://osfm.fire.ca.gov/media/0vphbxrc/isor-fhsz-sra-121622-to-020323.pdf>), but the high rating for
7 40 Acres will remain ([https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=](https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=fd937aba2b044c3484a642ae03c35677)
8 [fd937aba2b044c3484a642ae03c35677](https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=fd937aba2b044c3484a642ae03c35677)).

9 Federal Land

10 Inyo National Forest

11 While not within the Planning Area, the Inyo National Forest may impact 40 Acres in the event of a large
12 fire. The Inyo National Forest is less than 2 miles from 40 Acres at its closest point, and only few miles
13 distant as one goes farther north or south. Pine Creek canyon is a well-used recreational area just a few
14 miles to the southwest. The Land Management Plan for the Inyo National Forest (2019) is the guiding
15 document for the Forest. The USFS has created four Strategic Fire Management Zones within the forest
16 (Inyo National Forest 2019: 77-81):

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

36

37 STEWARDSHIP AGREEMENTS

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

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

DRAFT

AWSCA

APPENDIX B:

Community Background Information

This page intentionally left blank.

CONTENTS

1

2 Location and Geography B-1

3 Roads and Transportation B-2

4 Topography B-4

5 Population B-4

6 Social Vulnerability B-4

7 Recreation B-5

8 Fire Response Capabilities B-5

9 Local Response B-5

10 State Response B-5

11 Federal Response B-5

12 Mutual Aid B-6

13 Evacuation Resources B-7

14 Water Availability and Supply B-8

15 Vegetation B-9

16 Forest Health Considerations B-11

17 Wildlife B-13

18 Public Education and Outreach Programs B-14

19 Local and State Programs B-14

20 National Programs B-15

21

Figures

22

23 Figure B.1. Typical landscape in 40 Acres, showing the valley floor with sagebrush shrubland, trees,
24 and riparian vegetation along the ditch in the distance, and the Sierra Nevada range in the
25 background; view facing west into Hardy Road from North Round Valley Road..... B-1

26 Figure B.2. Typical landscape in 40 Acres, showing sagebrush shrubland in the foreground and timber
27 and riparian vegetation along the ditch in the background; view facing south into 40 Acres
28 from the northern extent of North Round Valley Road..... B-2

29 Figure B.3. Birchim Lane; view facing east..... B-3

30 Figure B.4. Local access road at the northwestern corner of 40 Acres, an example of a narrow,
31 unsurfaced road with limited turnaround space. B-4

32 Figure B.5. Water resources in 40 Acres. B-8

33 Figure B.6. 40 Acres existing vegetation cover..... B-10

34

35

1 LOCATION AND GEOGRAPHY

2 The 40 Acres (formerly known as Wright's 40 Acres) community is located in northwestern Inyo County in
3 Round Valley and comprises a total of 40 acres. It is about 12 miles west-northwest of Bishop and lies
4 between U.S. Highway 395 (U.S. 395) and the steep escarpment of the Wheeler Crest.

5 Although smaller than most communities of Owens Valley, 40 Acres shares the common characteristic of
6 eastern Sierra Nevada communities, with isolated patches of private land surrounded by federal land
7 and/or property owned by the City of Los Angeles. The community is square in shape with the outer
8 boundaries oriented west–east and north–south. Bureau of Land Management (BLM)-managed land is on
9 the west side. LADWP land is on the other three sides.

10 40 Acres is surrounded by a sagebrush scrub plant community largely composed of big sagebrush
11 (*Artemisia tridentata*), antelope bitterbrush (*Purshia tridentata*), rubber rabbitbrush (*Ericameria*
12 *nauseous*), and a wide variety of understory forbs and grasses (Figures B.1 and B.2) (Howald 2000).
13 Vegetation density (and therefore fuel continuity) is relatively sparse because of the arid climate (about
14 11–15 inches of precipitation annually on average). However, wind-driven embers would readily
15 propagate fire through the scrubland.



16
17
18
19
20

Figure B.1. Typical landscape in 40 Acres, showing the valley floor with sagebrush shrubland, trees, and riparian vegetation along the ditch in the distance, and the Sierra Nevada range in the background; view facing west into Hardy Road from North Round Valley Road.



1
2 **Figure B.2. Typical landscape in 40 Acres, showing sagebrush shrubland in**
3 **the foreground and timber and riparian vegetation along the ditch in the**
4 **background; view facing south into 40 Acres from the northern extent of**
5 **North Round Valley Road.**

6 An artificial channel that delivers water from Pine Creek to the community supports dense riparian
7 vegetation. Live and dead fuel loads along this channel are quite high and could readily carry a fire from
8 upstream into 40 Acres. This canal supplies water to nearly 1 mile of small irrigation channels serving all
9 parcels within 40 Acres and supports relatively luxuriant vegetation throughout the community. 40 Acres
10 is known as the “big green square of dense vegetation” observed in Round Valley when driving down the
11 Sherwin Grade on U.S. 395. The number of trees has been estimated at nearly 1,000, some of which are
12 up to 60 feet tall. The abundant vegetation contributes to 40 Acres often being described as an oasis,
13 with portions called a jungle.

14 ROADS AND TRANSPORTATION

15 40 Acres has two paved roads that have provided access to the community from the east and south.
16 Unfortunately, the southern route has been closed for the past 5 years because of the loss of a critical
17 bridge. Currently (early 2023), the sole paved road access to 40 Acres is Birchim Lane (Figure B.3). From
18 the northeast corner of 40 Acres, Birchim Lane goes east for 1.3 miles to the Old Sherwin Grade/Lower
19 Rock Creek Road, which parallels U.S. 395. From the junction of Birchim Lane and Old Sherwin Grade
20 Road, access to U.S. 395 is available 1.0 mile to the north and 1.5 miles to the south. Before the spring
21 2017 flood that destroyed the bridge over Pine Creek, and presumably after the bridge reconstruction is
22 completed in 2023, paved-road access to the southeast corner of 40 Acres is provided by North Round
23 Valley Road for a distance of 0.8 mile from the junction with the Pine Creek Road. From that junction,
24 U.S. 395 is 1.8 miles to the east along Pine Creek Road. North Round Valley continues unpaved to the
25 north beyond 40 Acres, connecting with Old Sherwin Road and Boundary Road to connect to the paved
26 Old Sherwin Grade Road after about 3 miles. To access individual parcels within 40 Acres, Birchim Lane

- 1 and Hardy Road traverse the north and south sides of the community, respectively. Waiford Circle and
- 2 Ocean View Road access parcels on the interior of the community, and both are dead-end access roads.
- 3 Most roads within 40 Acres are not paved and are narrow without turnarounds (Figure B.4), requiring fire
- 4 trucks to back in, particularly Birchim Lane and Ocean View Drive. These routes may prove hazardous
- 5 during emergency evacuation.



- 6
- 7

Figure B.3. Birchim Lane; view facing east.



1
2 **Figure B.4. Local access road at the northwestern corner of 40 Acres, an**
3 **example of a narrow, unsurfaced road with limited turnaround space.**

4 TOPOGRAPHY

5 The community is on the lower extent of an alluvial fan to the northeast of Pine Creek canyon at an
6 elevation of 4,600 feet. The natural landscape under 40 Acres descends from southeast to northwest at a
7 gentle slope of about 4 percent.

8 POPULATION

9 The exact population of the community is unknown but is estimated to be around 100. Sixty-two habitable
10 structures exist in the Planning Area varying in age from 2 to more than 100 years. Lot sizes range from
11 0.18 to 3.4 acres. Two lots remain undeveloped. Fifty-one homes are of frame and masonry construction.
12 Eleven homes are mobile or manufactured.

13 SOCIAL VULNERABILITY

14 The Federal Emergency Management Agency (FEMA) defines social vulnerability as the susceptibility of
15 social groups to the negative impacts of natural hazards (e.g., wildfire), which include disproportionate
16 death, injury, loss, or disruption of livelihood (FEMA 2022). A sole hazard occurrence can bring about
17 considerably different impacts for distinct individuals, even if the magnitude of the hazard was the same
18 for the entire community. Specific groups of individuals may be more susceptible to natural hazards
19 because of socioeconomic status, physical state, or other factors. For instance, elderly individuals may
20 have more difficulty in quickly evacuating during wildfire emergencies, which may make them more
21 susceptible to entrapment. In other cases, low-income individuals may be less able to harden and

1 improve their homes to reduce structural ignitability, indicating that they can face a higher probability of
2 their home being damaged or destroyed should a wildfire event occur.

3 According to the 2017 Inyo County and City of Bishop Multi-Jurisdictional Hazard Mitigation Plan (Inyo
4 County and City of Bishop 2017), social vulnerability for wildfire hazards is roughly the same between
5 residents within the high wildfire hazard zones of Inyo County, such as 40 Acres, and residents in all of
6 Inyo County. The similarity in social vulnerability between the communities located in wildfire hazard
7 zones and all Inyo County communities is owed to the similar socioeconomic composition of both
8 populations (Inyo County and City of Bishop 2017).

9 RECREATION

10 There is modest recreational use by non-residents of the BLM land to the west and LADWP lands on
11 other sides. Non-resident recreational use of the surrounding lands is primarily walking, running, and
12 mountain biking during the winter months by Mono County residents seeking snow-free dirt roads.
13 Cyclists from Bishop and Mono County use Old Sherwin Grade Road, Pine Creek Road, and North
14 Round Valley Road extensively. The number of recreation visits increases markedly up Pine Creek
15 canyon for hiking, backpacking, fishing, and climbing.

16 FIRE RESPONSE CAPABILITIES

17 LOCAL RESPONSE

18 The nearest volunteer station serving the Planning Area is the Paradise Fire Station, located at
19 5300 Lower Rock Creek Road, Paradise, and is 6 miles from 40 Acres. The Wheeler Crest Fire Station is
20 an additional 4 miles away to the northwest. There are three fire stations in Bishop: 3206 West Line St.,
21 209 West Line St., and 2190 North Sierra Highway (U.S. 395), which are 11 to 13 miles from 40 Acres.
22 There is also a fire station in Chalfant, which is 25 miles from 40 Acres.

23 STATE RESPONSE

24 California Department of Forestry and Fire Protection (CAL FIRE)

25 CAL FIRE San Bernardino Unit

26 The nearest CAL FIRE station serving the Planning Area is the CAL FIRE Bishop Station at 2781 South
27 Round Valley Road, Bishop, CA, 93514. When the bridge over Pine Creek is replaced, the distance to
28 40 Acres is about 5 miles (Map C.10 in Appendix C). The current detour without the bridge is about twice
29 as far.

30 FEDERAL RESPONSE

31 The management of wildfire ignitions for multiple resource objectives (managing naturally burning fires in
32 forests as a tool for helping to restore forest health and mitigating the escalating costs of fire suppression)
33 is practiced on federal land but depends on a thorough assessment of risk to values at risk (VARs) in the
34 WUI. Depending on the location and nature of a wildfire, policies developed through interagency

1 collaboration outline appropriate management responses to guide district personnel in the application of
2 specific suppression techniques. All large wildfire response would be based on assessment using
3 WFDSS (U.S. Geological Survey [USGS] 2021).

4 Inyo National Forest

5 Overall, the USFS provides wildfire response and management for over 193 million acres of National
6 Forest System land within the United States (CRS 2021). National Forest lands are considered FRAs,
7 which are regions where the federal government is responsible for fire response. National Forest lands
8 are less than 3 miles west of 40 Acres. On USFS land, the USFS has the responsibility for the
9 management of wildland fire including initial attack (initial response).

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

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

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

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

24 Bureau of Land Management

25 Public domain lands adjacent to and near 40 Acres are administered by the BLM Bishop Field Office.
26 The BLM is a member of the California Forest Management Task Force (CA FMTF). The CA FMTF is
27 composed of several state, federal, and local wildland firefighting agencies. Additionally, the CA FMTF
28 joins local communities to prevent or minimize fire danger (BLM 2021).

29 MUTUAL AID

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

36 CAL FIRE BDU participates in the Statewide Mutual Aid system and maintains agreements with local
37 response organizations, including incorporated cities, neighboring counties, and state and federal
38 wildland agencies.

1 EVACUATION RESOURCES

2 Evacuation planning is a joint effort among county departments, with law enforcement as the lead
3 agency. 40 Acres operates under the Inyo County evacuation procedures. At a county level, evacuation
4 routes and procedures are detailed in the Emergency Operations Plan and Hazard Mitigation Plan
5 (Inyo County 2016, 2017).

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

8 People

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

- 10 • **Emergency notification methods:** Inyo County has established CodeRED, an Emergency
11 Notification System that utilizes reverse 911. Residents must register their numbers in the
12 system. Social networking sites such as Facebook, Nextdoor, and Twitter, as well as locally
13 maintained blogs and email distribution lists, are other resources that have become highly valued
14 during wildfires in nearby communities.
- 15 • **Preplanning by the public about how to evacuate and where to go:** Dead-ends, poor or
16 missing signage, and conflicts with emergency vehicles driving into the community versus the
17 public trying to leave complicate evacuation efforts. Uncertainty about where to find temporary
18 refuge can cause families to become separated and delay reunions. Some individuals without
19 transportation or with limited mobility may be accidentally left behind.
- 20 • **Public awareness:** These two items will fail to occur throughout CARs if the residents are
21 unaware of notification methods: 1) the need for preplanning and 2) the elements that should be
22 included in preplanning. Therefore, public education and outreach on these topics should be part
23 of all efforts conducted by agencies such as fire departments in a wide variety of venues.

24 Animals and Livestock

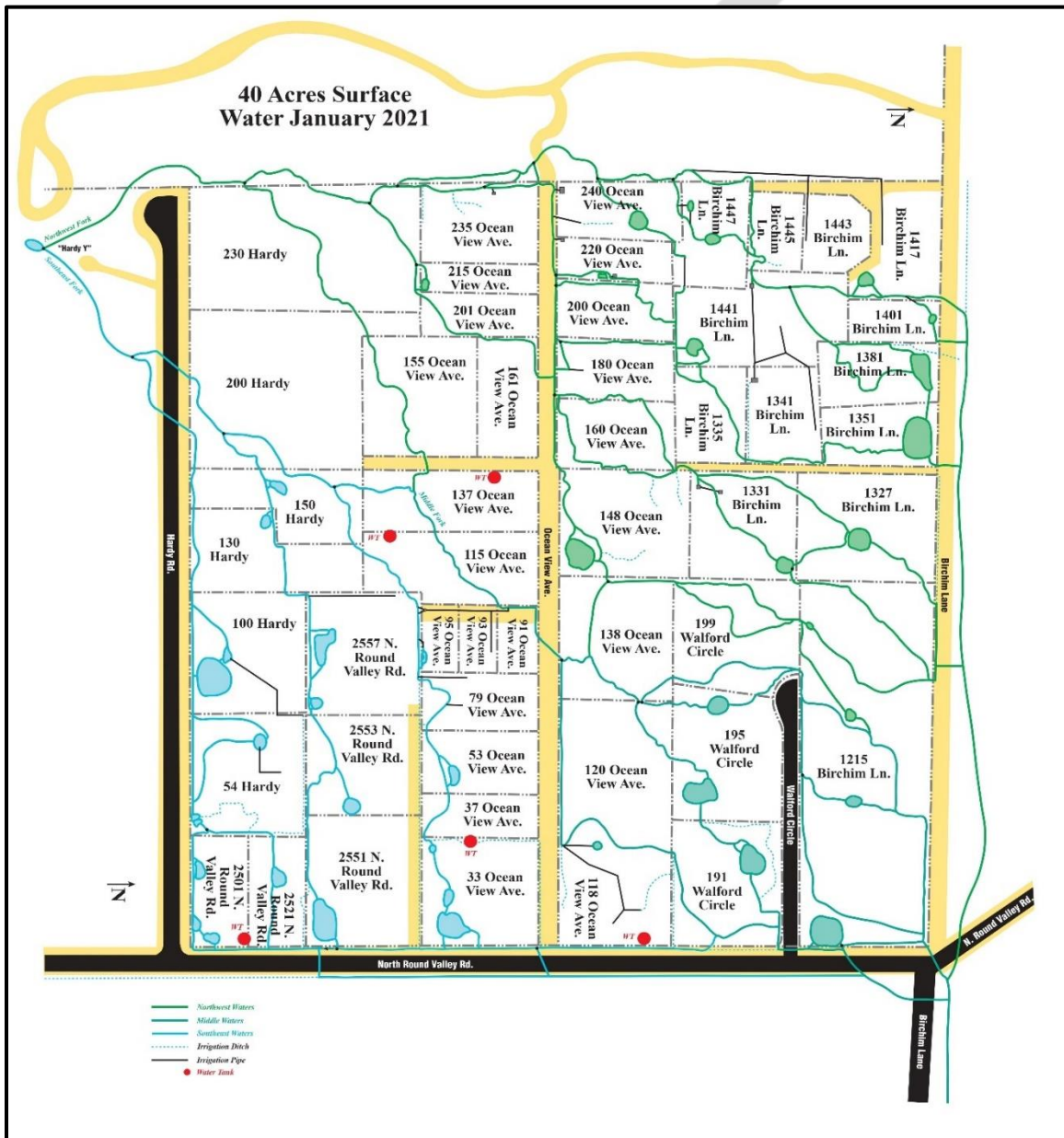
25 In the event of a wildfire, it is important that residents and fire responders have a plan for evacuation of
26 pets and livestock. Evacuation planning often neglects to describe how animals will be evacuated and
27 where they will be taken. The loading of horses, for example, during a fire and smoke situation, and
28 transport of stock vehicles down narrow roads under stressful situations, can be very difficult. Public
29 education could emphasize the need for individuals to have a plan for the evacuation of pets in addition to
30 their family, ensuring a lack of planning doesn't slow or prevent evacuation.

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

35 Inyo County Animal Services helps with evacuating small and large animals from fire areas; this applies to
36 40 Acres residents as well. In the past, Millpond Equestrian Center and the Tri-County Fairground have
37 offered emergency housing for evacuated animals.

1 WATER AVAILABILITY AND SUPPLY

2 Homeowners within 40 Acres rely on individual wells for domestic water supply. Outside irrigation water
 3 originates at a diversion from Pine Creek with a pre-1914 water right. A small unlined canal brings this
 4 water to the southwest corner of 40 Acres at the end of Hardy Road, where it flows into two distribution
 5 channels. Water in these channels then enters a network of ditches that serve each parcel. There are
 6 nine ponds that are filled by the ditches that can serve as water supplies for fire suppression efforts.
 7 These nine small reservoirs are near the main roads within the community and can be readily accessed
 8 for filling water tender trucks or direct pumping. There are also a few tanks in the community that may
 9 offer additional water for fire suppression. Figure B.5 shows all the water resources in 40 Acres.

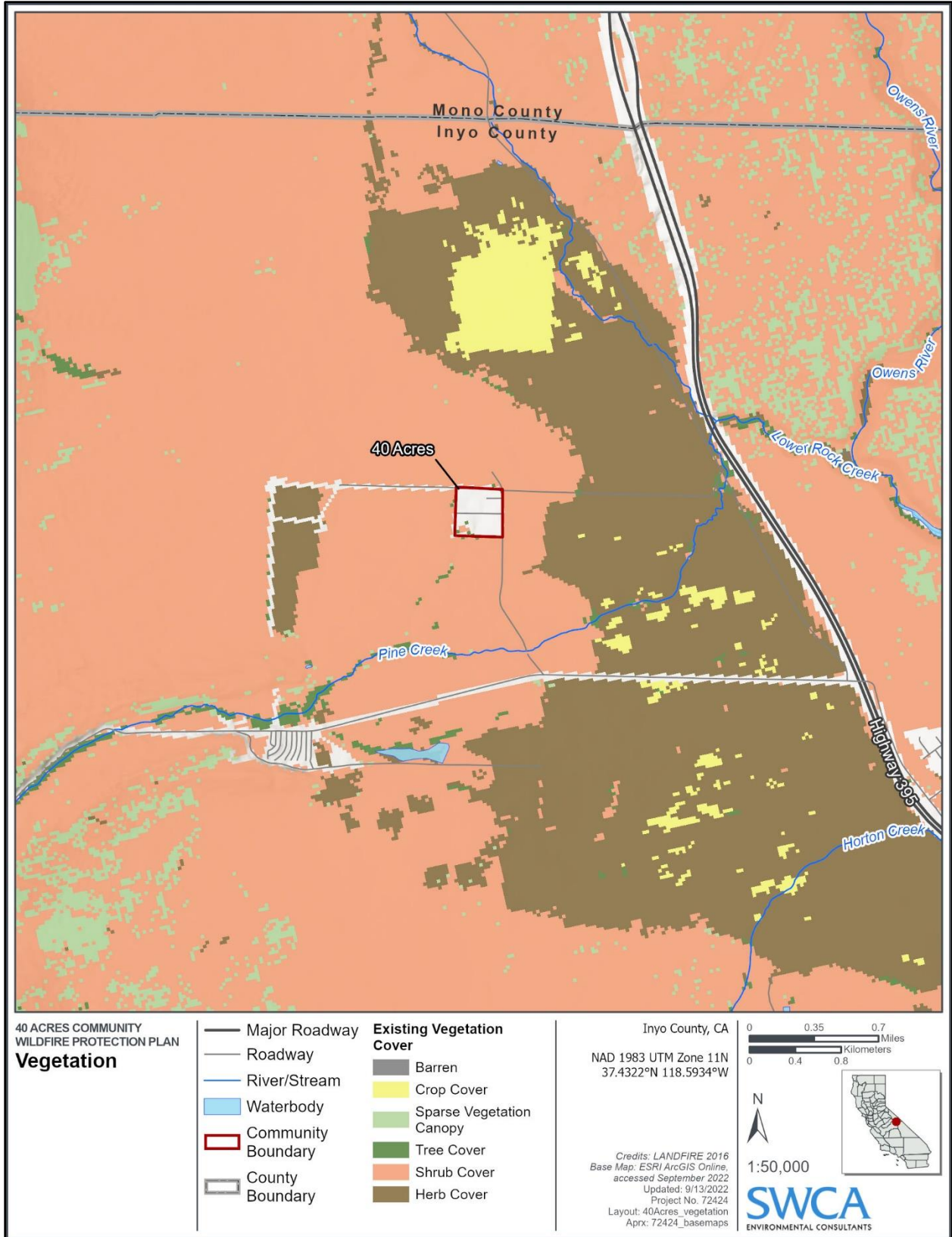


10
 11 **Figure B.5. Water resources in 40 Acres.**
 12 Source: 40 Acres FSC

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

8 VEGETATION

9 Vegetation zones within the community and surrounding environment are primarily a function of elevation,
10 slope, aspect, substrate (i.e., soils), and associated climatic regimes. Since the Planning Area is relatively
11 homogenous in terms of elevation and topography, there is little change in vegetation characteristics
12 across the area. Most of the Planning Area comprises grass-shrub communities, with pockets of
13 dispersed trees and riparian vegetation along ditches and creeks (Figure B.6).



1

2 **Figure B.6. 40 Acres existing vegetation cover.**

1 FOREST HEALTH CONSIDERATIONS

2 Insects

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

7 In addition to native insect epidemics, exotic pests also pose a significant threat to forest ecosystems.

8 Invasive species are organisms that are introduced into an area beyond their natural range and become
9 pests in the new environment. They are also referred to as exotic pests, alien, non-native, or introduced
10 pests. Most introductions have been unintentional and accidental. Having evolved in a different
11 environment, these invasive species may have few natural enemies in their new locations, which can
12 often lead to rapid population increases that can out-compete native species for resources.

13 The introduction of exotic pests is likely to cause economic, environmental, and agricultural harm as well
14 as harm to human health (California Department of Food and Agriculture [CDFA] 2021). In general, traits
15 of invasive species include fast growth, rapid reproduction, rapid adaptability, tolerating a wide range of
16 environmental conditions, and utilizing a variety of different foods (CDFA 2021).

17 Insect epidemics in California forests continue to persist. In 2021, USFS's annual aerial survey showed
18 tree mortality in 1.3 million acres out of 38 million acres that were surveyed. Tree mortality is strongly
19 correlated with extreme and prolonged drought and subsequent bark and engraver beetle attacks (USFS
20 2021c). Stands of trees that have been killed by insects have varying degrees of associated fire danger
21 depending on the time lapse following an insect attack and structure, fuel loading, and continuity of the
22 fuels that remain. However, forests with a large degree of mortality following an insect attack may have
23 the potential to experience extreme fire behavior, especially if a large degree of needle cover remains in
24 the canopy. Moreover, heavy dead fuels increase the fire suppression difficulty and snags are a
25 significant hazard to fire crews.

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

- 28 • **Bark Beetles (Ips Beetles)** (*Ips* spp. and *Dendroctonus* spp.) (California Forest Pest Council
29 [CFPC] 2020)
- 30 • **Mountain Pine Beetle** (*Dendroctonus ponderosae*) (CFPC 2020)
- 31 • **Jeffrey Pine Beetle** (*Dendroctonus jeffreyi*) (CFPC 2020)
- 32 • **Pinyon Needle Scale** (*Matsucoccus acalyptus*) (CFPC 2021; USFS 2021c)
- 33 • **California flatheaded borer** (*Phaenops californica*) (USFS 2018b)
- 34 • **Pandora moth** (*Coloradia pandora*) (USFS 2018b)
- 35 • **Douglas-fir Tussock moth** (*Orgyia pseudotsugata*) (USFS 2018b)

36 Diseases

37 Diseases of trees, such as parasitic plants, fungi, and bacteria, can also affect forests in the region (e.g.,
38 Inyo National Forest). These diseases impact forest systems by degrading the productivity and health of

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

- 3 • **White Pine Blister Rust** (*Cronartium ribicola*) (USFS 2018b)
- 4 • **Armillaria root disease** (*Armillaria sp.*) (USFS 2018b)
- 5 • **Black stain root disease** (*Leptographium wageneri*) (USFS 2018b)
- 6 • **Heterobasidion root disease** (*Heterobasidion sp.*) (USFS 2018b)
- 7 • **Dwarf mistletoe** (*Arceuthobium campylopodum*) (USFS 2018b)

8 Impact of Climate Change

9 The rapidly shifting climate, particularly rising temperatures, combined with changing wind patterns, and
10 increasing temporal and spatial variability of water availability, are considerably escalating wildfire risk
11 across the state. The recurrence of severe fire weather during the autumn months has more than doubled
12 in California since the 1980s, and, considering climate change, this prevalence is projected to increase in
13 the future. As stated in California's Fourth Climate Change Assessment, if greenhouse gas emissions
14 continue to increase, California is expected to experience a 50% increase in fires larger than
15 25,000 acres as well as a potential 77% increase in average area burned by 2100. The state has already
16 begun to encounter the impacts of increased fire occurrence and severity. In fact, 60% of the top
17 20 largest wildfires in California occurred in the last 5 years, including the August Complex fire (August
18 2020) and the Dixie fire (July 2021). The August Complex and Dixie fires alone burned a combined total
19 of nearly 2 million acres and well over 2,000 structures (CAL FIRE 2022b). It is clear that extreme wildfire
20 events continue to present a significant threat to California's communities.

21 In addition to direct damage (e.g., structure and property damage) caused by wildfires,
22 uncharacteristically large and severe wildfires also cause indirect impacts on the environment and
23 ecosystem services. Wildfires are known to deteriorate local and regional air quality, pollute waterways,
24 displace native species (animal and plant), and increase carbon dioxide emissions. The increased carbon
25 dioxide emissions are of special concern since carbon dioxide is a greenhouse gas. Greenhouse gases
26 are implicated in climate change, and climate change is a critical factor exacerbating frequency and
27 severity of wildfires (CA GOPR 2019).

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

33 Tree Mortality

34 Rising temperatures, extensive droughts, extreme wildfires, and insect outbreaks have contributed to
35 widespread tree mortality in the Inyo National Forest (USFS 2018b). Tree mortality due to the
36 aforementioned factors is a natural process in forest ecosystems. However, if due to compound
37 disturbances or other factors, many trees die in a brief time period over large regions, forest health may
38 be negatively affected. In addition to disrupting ecosystem functions, widespread tree mortality near
39 developed or recreational areas present hazards as they can fall and potentially endanger the public and
40 infrastructure (National Park Service [NPS 2021]). Furthermore, the level of risk posed by hazard trees is
41 contingent on the amount of time that has passed since the individual or population has died and the

1 amount of fuel that has fallen to the forest floor. In the Sierra Nevada, recent droughts and rising
2 temperatures have contributed to an increase in dead woody fuels that persist for a long period of time
3 and present a significant wildfire hazard. As such, any increase in tree mortality results in increased fuel
4 loading which contributes to the potential for high severity fire and extreme fire behavior in the region
5 (UCANR 2020).

6 During the 2012-2016 drought, tree mortality increased significantly. Rising temperatures and reduced
7 water availability have stressed trees, thereby increasing their physiological stress and their susceptibility
8 to insect and pathogen infestations (California Office of Environmental Health Hazard Assessment 2019).
9 Roughly 129 million trees were estimated to have died between 2012 and 2017. In 2016 alone, 62 million
10 trees died, with 95% of tree mortality occurring in the Sierra Nevada (UCANR 2017). Recent surveys
11 indicate that the tree mortality trend is likely to continue. In its 2021 annual aerial survey, the U.S. Forest
12 Service (USFS) detected 9.5 million dead trees statewide, mostly fir, followed by ponderosa pine, bringing
13 the cumulative total to 173 million dead trees since 2010 (USFS 2021c). Most of the surveyed tree
14 mortality occurred in the southern areas of the Sierra Nevada range. In Inyo County, 10,000 acres with
15 68,000 deceased trees were detected (USFS 2021c).

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

28 WILDLIFE

29 Vegetation management treatments could be applied around 40 Acres to benefit habitat for general
30 wildlife species or game habitat. Most native wildlife species found in the region evolved with a frequent
31 fire regime.

32 Threatened and Endangered Species

33 According to the U.S. Fish and Wildlife Service's Information for Planning and Consultation Tool, a few
34 endangered or threatened species have the potential to occur within and around the Planning Area.
35 These endangered or threatened species include one mammal (Fisher [*Pekania pennanti*]), two birds
36 (Southwestern Willow Flycatcher [*Empidonax traillii extimus*] and Yellow-billed Cuckoo [*Coccyzus*
37 *americanus*]), and two fishes (Owens Pupfish [*Cyprinodon radiosus*] and Owens Tui Chub [*Gila bicolor*
38 *ssp. snyderi*]) (U.S Fish and Wildlife Service n.d.).

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

1 Treatments on federal land adjacent to 40 Acres would be subject to NEPA and associated analysis of
2 impacts to these species. Treatments in areas that may impact threatened and endangered species
3 would require application of certain mitigation measures to prevent degradation to habitat. As an example
4 of a mitigation measure, fuels treatment activities on federal lands may be subject to restrictions
5 according to limited operating periods. Limited operating periods decrease the time frame for which fuels
6 treatment activities may occur.

7 PUBLIC EDUCATION AND OUTREACH PROGRAMS

8 LOCAL AND STATE PROGRAMS

9 40 Acres Fire Safe Council

10 40 Acres Fire Safe Council (FSC) was established in 2020 by community volunteers to promote fire safety
11 and prevention, provide education, and exchange information in the community. The Council offers
12 various educational resources such as brochures on hardened homes and defensible space, evacuation
13 guides, disaster readiness guides, and home evaluation guides. The Council has a fire prevention grant
14 from CAL FIRE via the Whitebark Institute to reduce hazardous fuel loads on 29 acres of BLM and
15 LADWP land surrounding the community as well as within the community.

16 The 40 Acres Fire Safe Council may add a webpage on the Eastern Sierra Wildfire Alliance site in 2023:
17 <https://www.eswildfirealliance.org/fire-safe-councils>

18 California Department of Forestry and Fire Protection (CAL FIRE)

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

- 24 • [CAL FIRE Fire and Emergency Response Guide](#)
- 25 • [California Fire Plan Overview](#)
- 26 • [CAL FIRE Cooperative Emergency Response](#)
- 27 • [Ready Set Go! Wildfire Action Plan](#)
- 28 • [Are You Ready? Defensible Space and Home Hardening](#)
- 29 • [Are You Set? Wildfire Preparedness](#)
- 30 • [Defensible Space Guide](#)
- 31 • [Before, During, and After a Wildfire](#)

1 NATIONAL PROGRAMS

2 Ready, Set, Go!

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

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

9 **Ready** – Take personal responsibility and prepare long before the threat of a wildland fire so your
10 home is ready in case of a fire. Create defensible space by clearing brush away from your home.
11 Use fire-resistant landscaping and harden your home with fire-safe construction measures. Assemble
12 emergency supplies and belongings in a safe place. Plan escape routes and ensure all those residing
13 within the home know the plan of action.

14 **Set** – Pack your emergency items. Stay aware of the latest news and information on the fire from
15 local media, your local fire department, and public safety.

16 **Go** – Follow your personal wildland fire action plan. Doing so will not only support your safety but will
17 allow firefighters to best maneuver resources to combat the fire.

18 National Fire Protection Association

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

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

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

31 National Interagency Fire Center

32 The National Interagency Fire Center (NIFC) provides a wide array of fire resources and services.
33 The National Interagency Coordination Center offers communication assistance to over
34 32,000 firefighters and 50 major events at one given time (NIFC 2021c). The Predictive Services group
35 provides decision support information to be more proactive in anticipating significant fire activity and
36 determining resource allocation needs, based on current fire danger, climate and forecasted weather. The
37 Predictive Services group uses weather data from over 2,000 remote automated weather stations to
38 assist in their analysis and predictions. The National Wildfire Coordinating Group, which is nested under
39 the NIFC, provides operational coordination to federal, state, local, tribal, and territorial partners (NIFC

1 2021c). The NIFC also has a training branch where training curriculums are developed to be used across
2 the nation. For those too young to participate in the standard trainings, the NIFC offers FireWorks, an
3 educational program designed for kids K-12. The program teaches children topics such as wildland fire
4 science, ecosystem fluctuations, human interaction on the environment, and other environmental science
5 topics (NIFC 2021d). The NIFC also provides public education resources (NIFC 2021e):

- 6 • [Wildfire Readiness – Home](#)
- 7 • [Wildfire Readiness – Business](#)
- 8 • [Wildfire Readiness – Farm and Ranch](#)
- 9 • [Weekend Wildfire Preparedness](#)
- 10 • [What to Do if a Wildfire is Approaching](#)
- 11 • [Wildfire Risk – Community](#)
- 12 • [Prepare and Protect Your Home](#)
- 13 • [Prepare Your Community](#)
- 14 • [One Less Spark, One Less Wildfire](#)
- 15 • [Only You Can Prevent Wildfires](#)

16 U.S. Fire Administration’s WUI Toolkit

17 The U.S. Fire Administration (USFA) is an entity of the U.S. Department of Homeland Security’s Federal
18 Emergency Management Agency (FEMA) that aids in the preparation for and response to fire. Their WUI
19 toolkit consists of a list of websites and other information regarding risk assessments, public outreach,
20 and community training. Find the toolkit here: <https://www.usfa.fema.gov/wui/>.

21 Wildfire Research Center (WiRē)

22 Wildfire Research Center (WiRē) is a non-profit organization that works with local wildfire services to
23 achieve community-tailored pathways which reduce risk to wildfire while simultaneously promoting
24 pathways to fire adaptation. WiRē’s mission states that fire adaptation is “about living with fire”, while
25 “creating safe and resilient communities that reduce wildfire risk on their properties before a fire, and
26 supporting effective response when fires threaten a community.” WiRē states that wildfire is an integral
27 component of many ecosystems, and that fire must be allowed, when safe, to ensure the health of
28 forests. Core to WiRē’s approach are four main concepts. One, residents are critical actors in the
29 wildland-urban interface wildfire problem. Two, action is central to adaptation. Three, people and their
30 decisions are complex. Finally, four, decisions are not made in a vacuum. To achieve its goals and serve
31 communities, WiRē will typically conduct a “rapid wildfire risk assessment,” which assesses what
32 contributes to wildfire risk, such as, building materials, vegetation near homes, background fuels, local
33 topography, and access to emergency fire services. Additionally, they also conduct “social surveys”,
34 which assess residents’ perceptions about wildfire, wildfire risk, risk mitigation behavior, and assess their
35 willingness towards taking action to reduce wildfire risk.

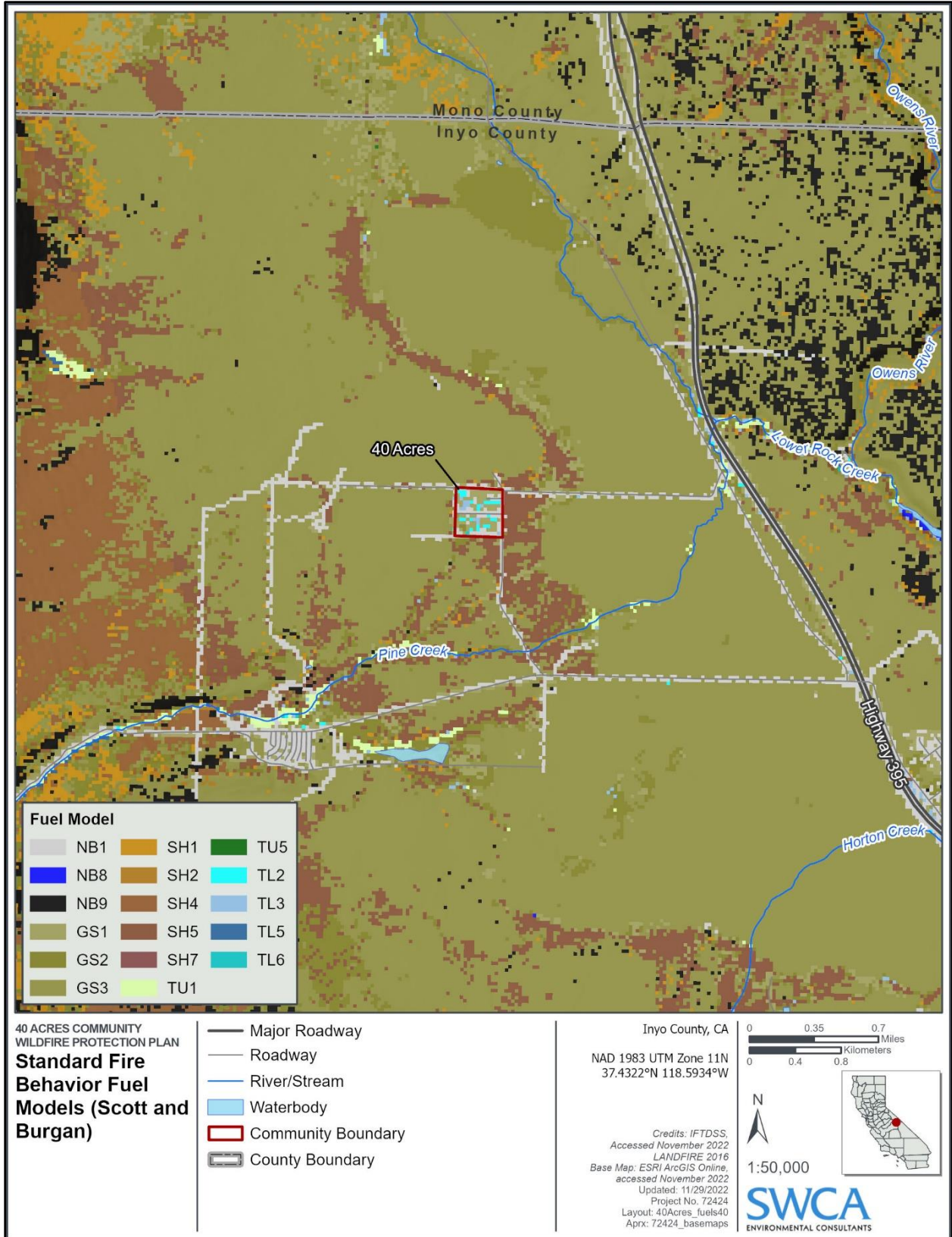
36 For more information, please visit <https://wildfireresearchcenter.org/>.

37

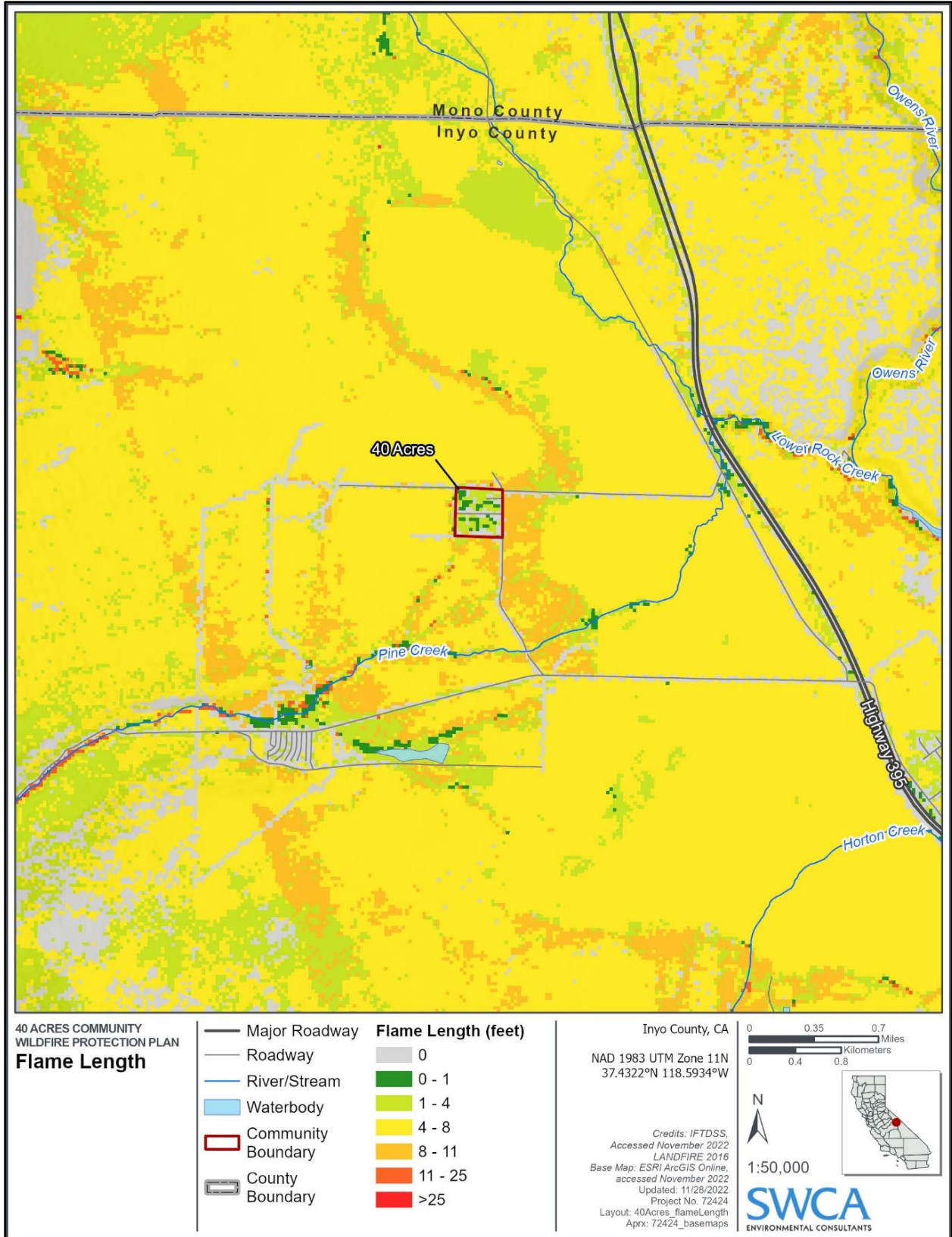
AWCS

APPENDIX C:
Additional Mapping

This page intentionally left blank.

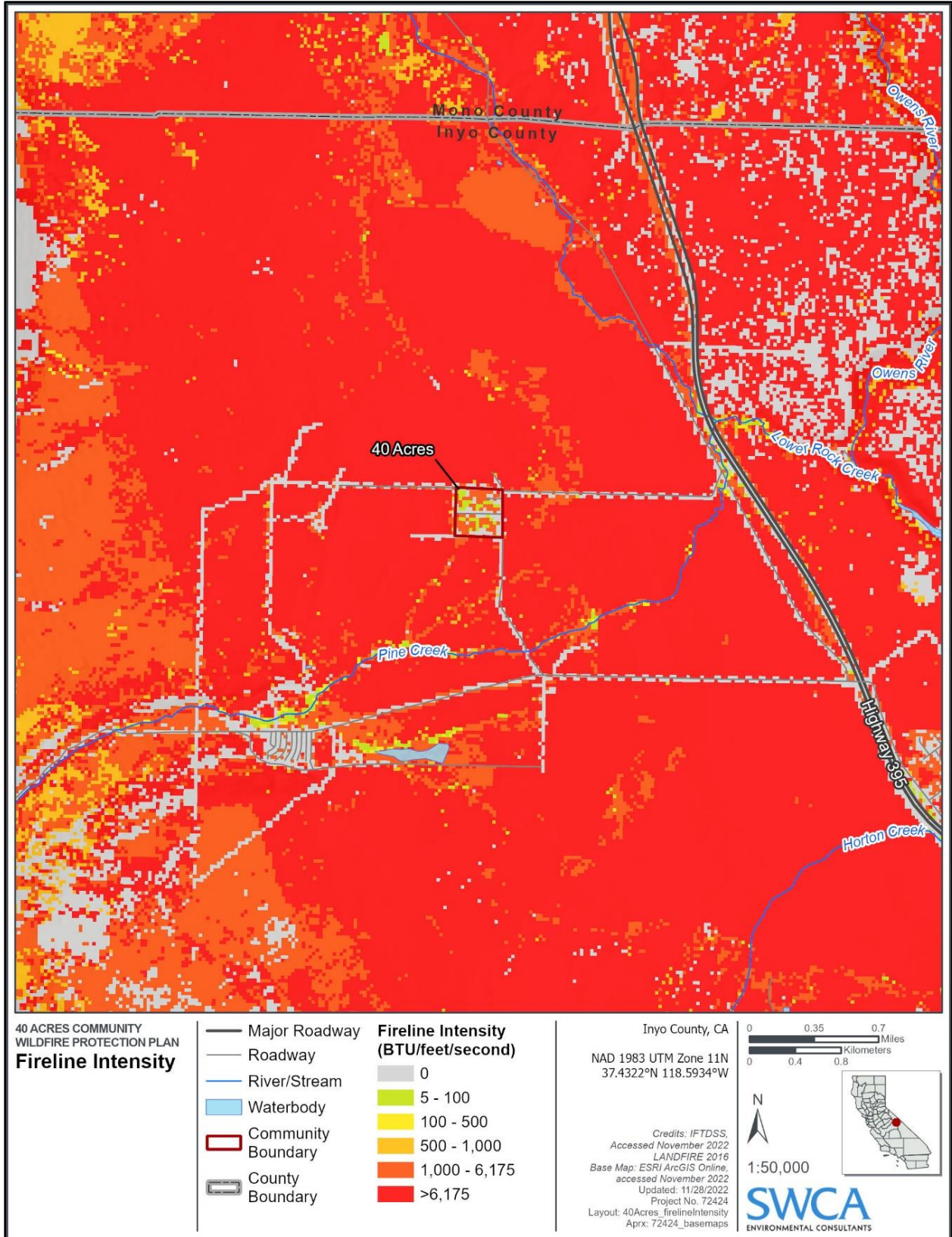


1
 2 **Map C.1. Scott and Burgan 40 Fire Behavior Fuel Models.**



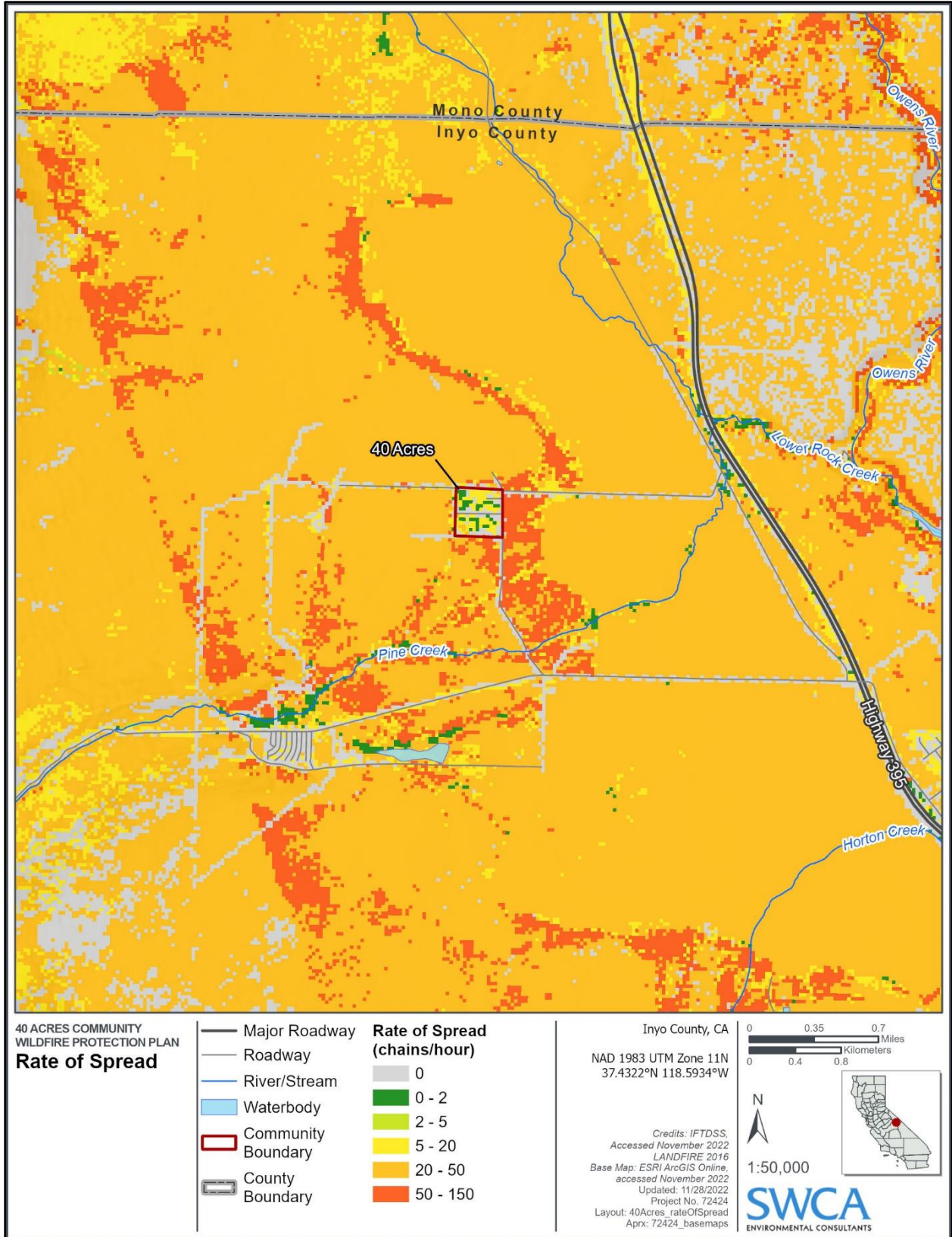
1

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



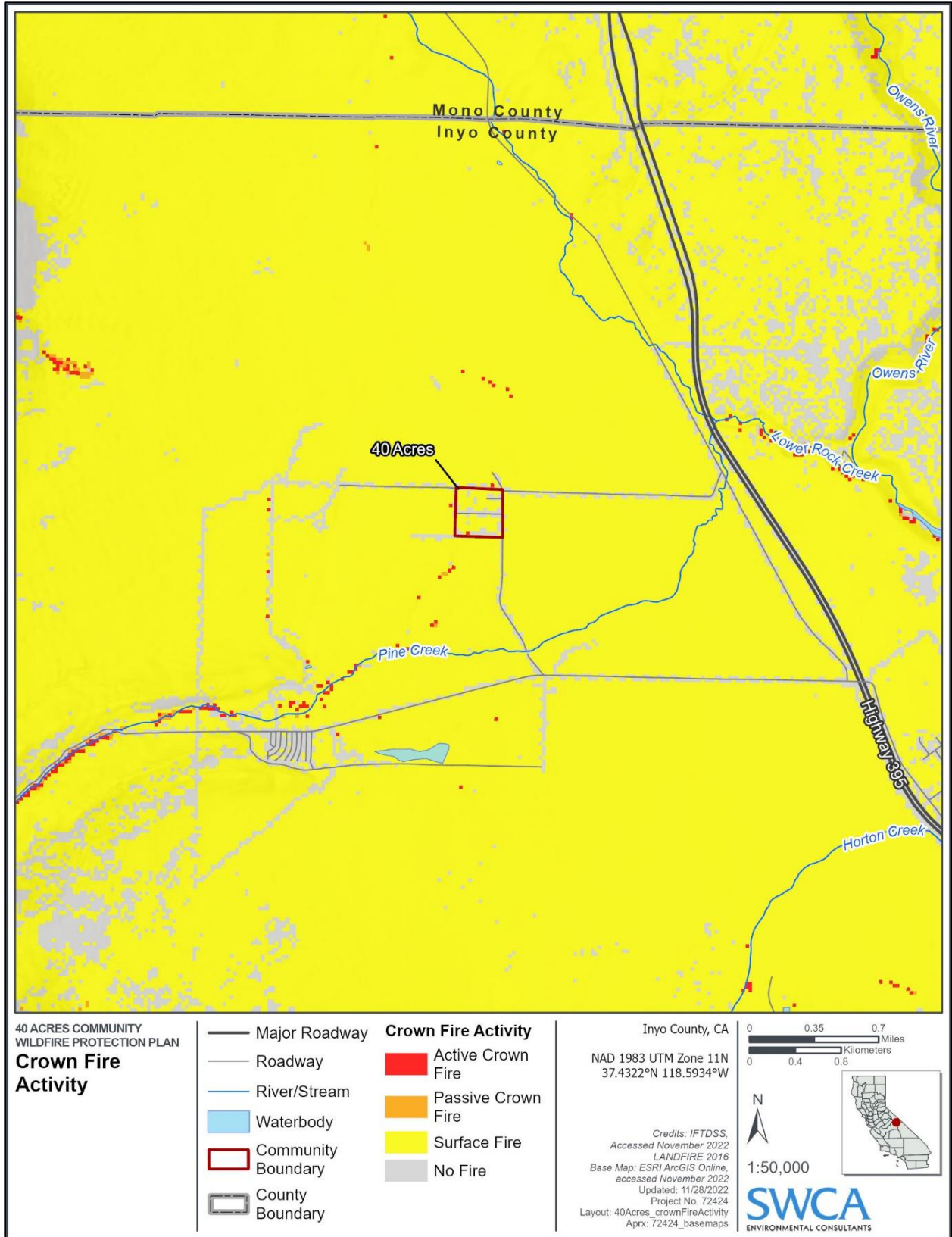
1

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



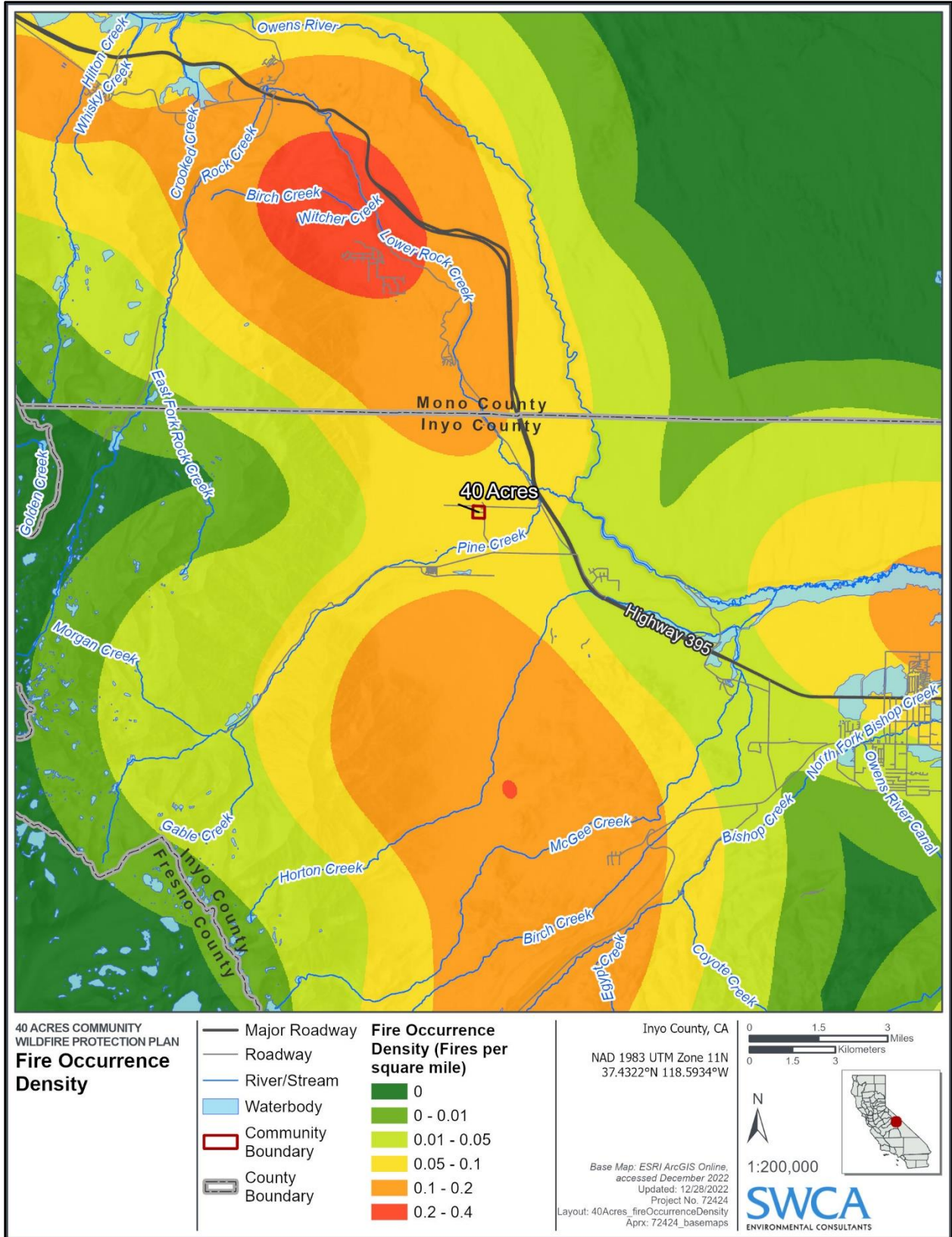
1

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



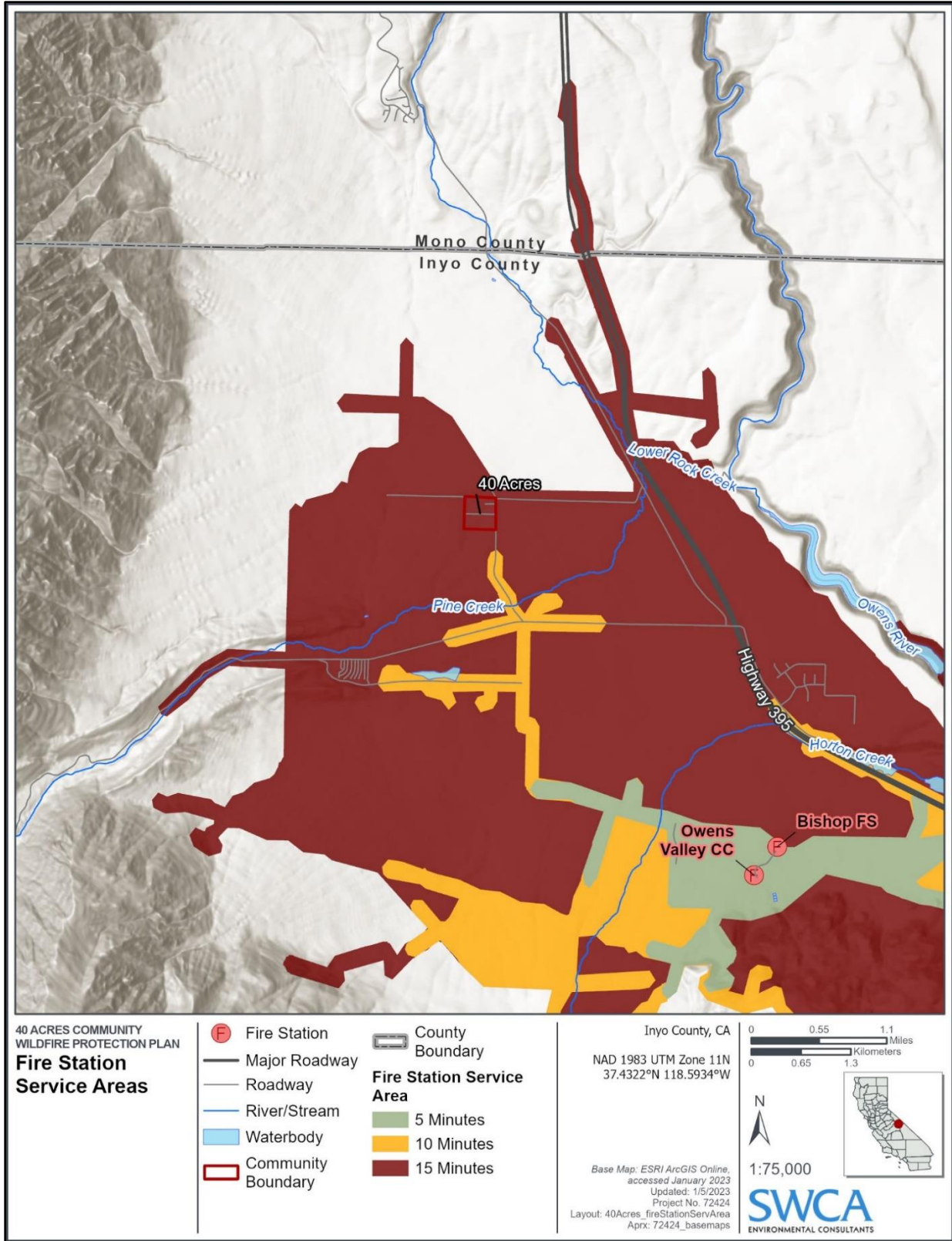
1

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

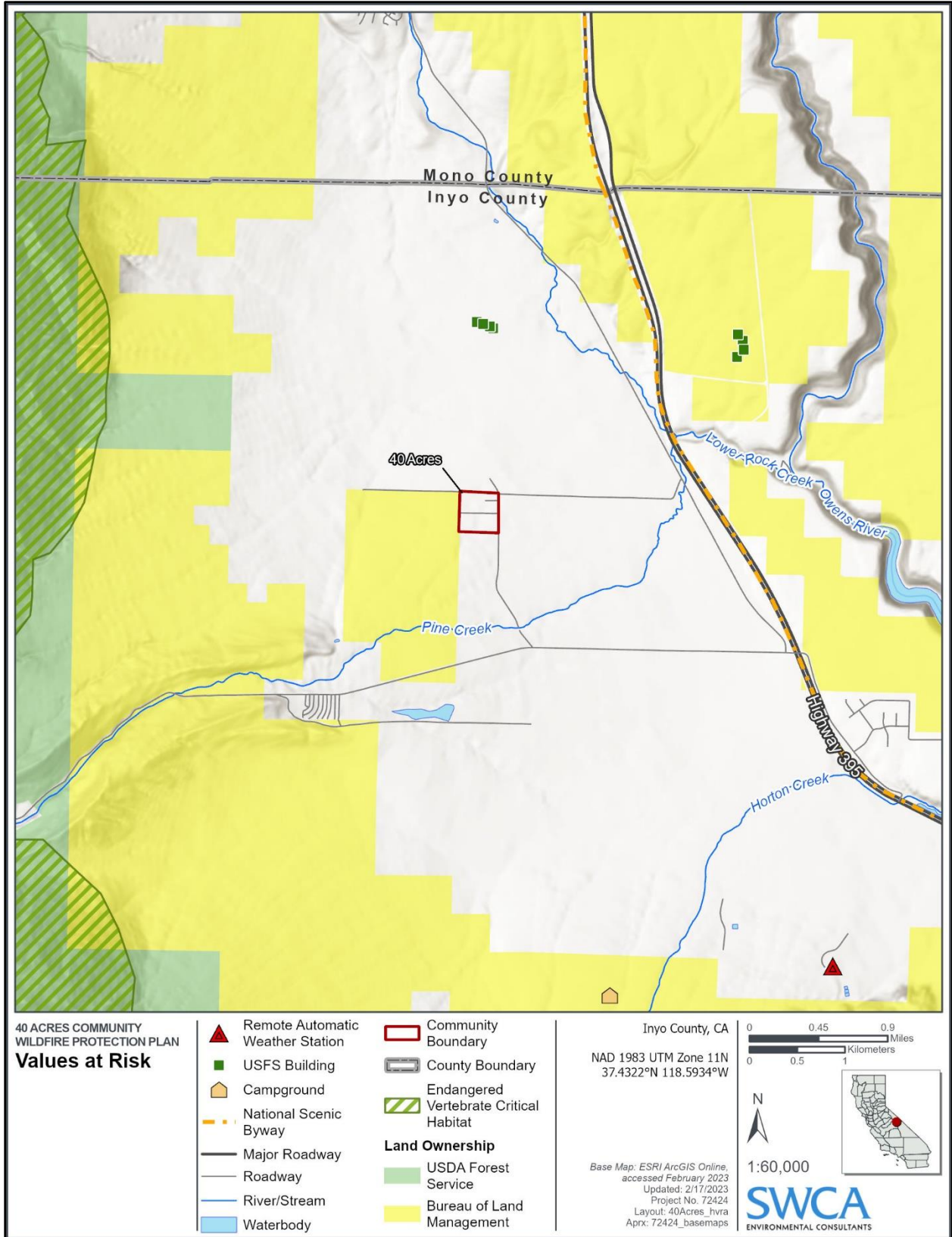


1

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

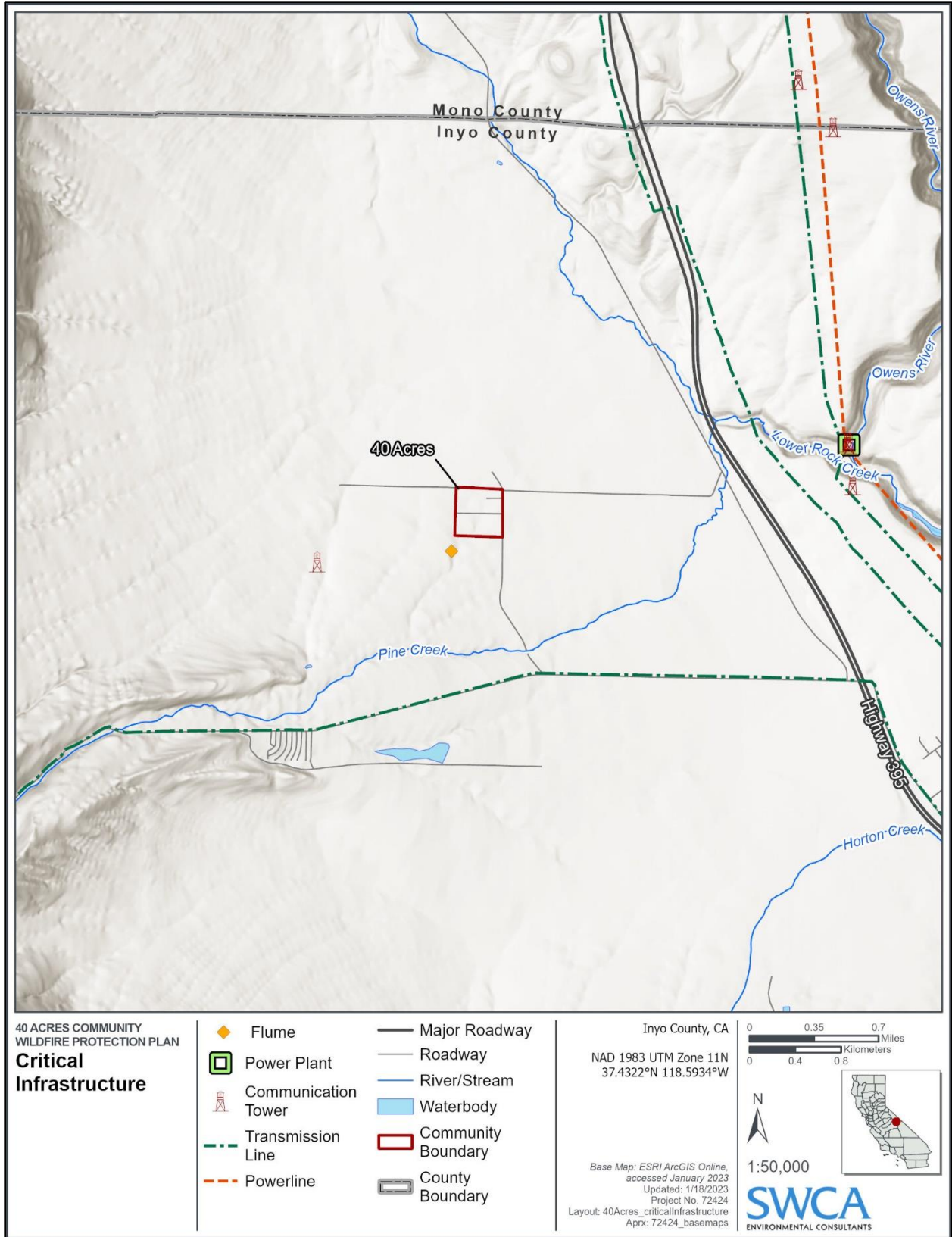


1
 2 **Map C.7. Risk-Hazard Assessment inputs: fire station service areas.** Note: The fire response drive
 3 times were calculated when N Round Valley Road was closed. Response times to 40 Acres will
 4 decrease once N Round Valley Road opens.

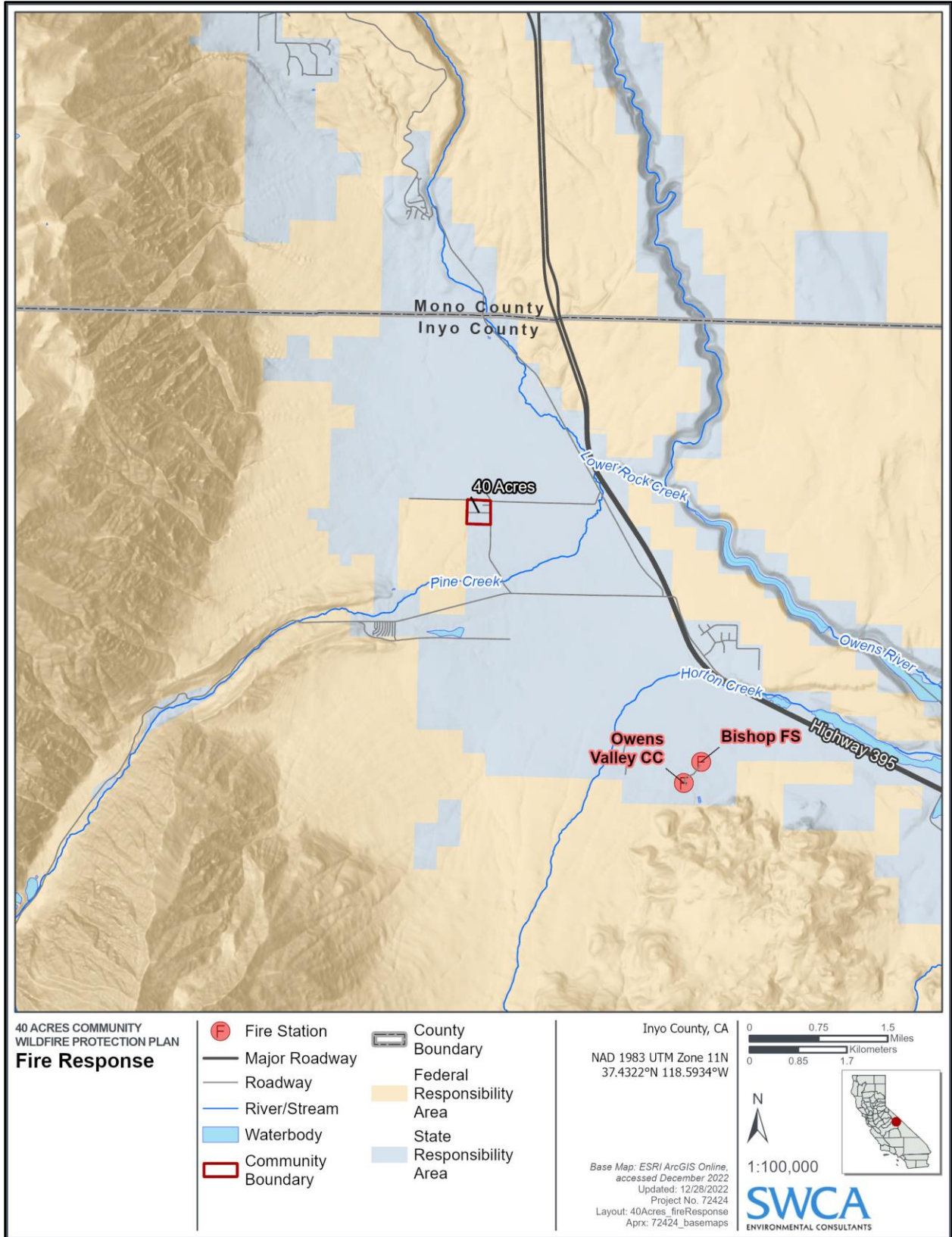


1

2 **Map C.8. Values at risk.**



1
2 **Map C.9. Critical infrastructure.** Note: critical infrastructure such as irrigation ditches and pipes and
3 water tanks within 40 Acres can be viewed at a closer scale in Figure B.5 in Appendix B.



1

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

WUI

APPENDIX D:

Community and Parcel Risk-Hazard Assessments for
WUI Communities

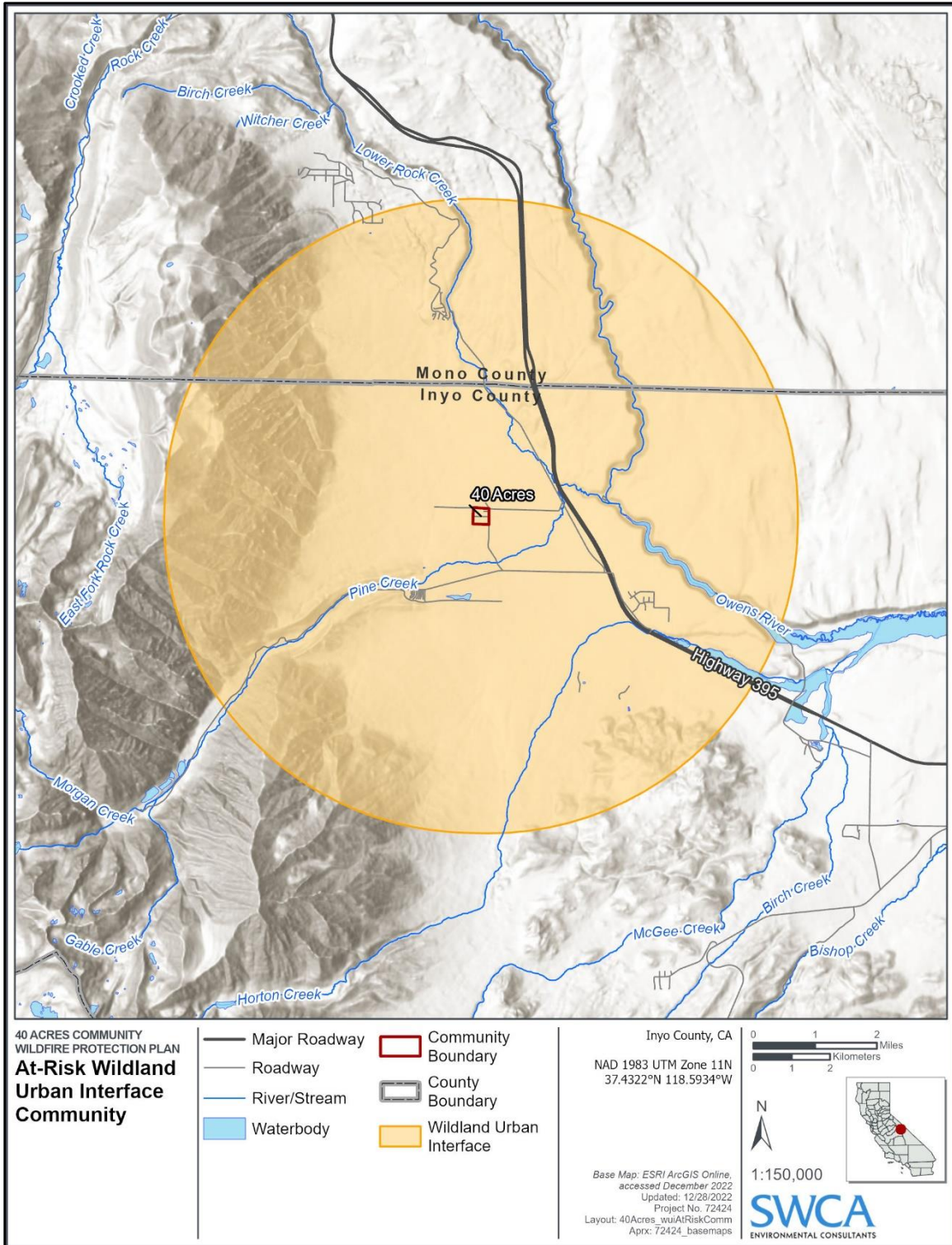
This page intentionally left blank.

1

40 ACRES

2

COMMUNITY ASSESSMENT SUMMARY



3

4

Figure D.1. 40 Acres community boundary and WUI.

1
2
3
4
5
6
7
8
9

40 ACRES COMMUNITY-LEVEL ASSESSMENT SUMMARY

40 ACRES SUMMARY STATISTICS

Community Polygon Background

Community Polygon Name: 40 Acres **Total Score:** 87 (high) **Land Area (acres):** 43

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): 100%*

15+ (min): 0%

* Note – when Round Valley Road opens, the driving time from the fire station will be minimized to 0-5 minutes.

Fire Department Statistics:

Fire Department: CAL FIRE Bishop Forestry Fire Station

Fulltime Firefighters: 2 On-call Firefighters: 6 Volunteer Firefighters: --

Water Tender: --

Wildland Engines

Type 1: --	<u>Total Number:</u>	<u>4WD/AWD:</u>	<u>Brush Breaker:</u>
------------	----------------------	-----------------	-----------------------

Type 2: --	Type 3: 1	1	--
------------	-----------	---	----

Type 3: --	Type 4: --	--	--
------------	------------	----	----

<u>Structure Engines:</u>	Type 5: --	--	--
---------------------------	------------	----	----

Type 1: --	Type 6: --	--	--
------------	------------	----	----

Type 2: --	Type 7: --	--	--
------------	------------	----	----

Port-A-Tanks: --

Portable Pumps: -- Primary water source: hydrant

1144 Survey Summary Highlights

Positive Attributes (Low Scores)

- 2 or more roads in and out of community
- Surfaced roads with < 5% grade
- Street signs present and reflective
- Low angle slopes around structures, decks, and fences
- Good water source (3 water tanks)

Negative Attributes (High Scores)

- Narrow roads < 20 ft in width
- < 30 ft of defensible space for most structures
- Fire access is < 300 ft with no turnaround
- Hazardous topographic features
- History of high fire occurrence
- Potential for severe fire weather
- Little separation of adjacent structures
- Combustible house siding
- Predominantly combustible roofing material
- Predominantly combustible deck and fence material
- > than 5 mi from a fire station
- Gas and electric utilities are above ground
- Grass Shrub (GS) is primary predominant vegetation
- Significant dead and dying fuels within community and adjacent areas/ditches

1

Suggested Mitigation Focus Area

Areas of Concern:

- North, east, and south sides have high grass-shrub loading
- North and east sides have heavy riparian fuels with some dead and downed logs along ditches
- Southwest corner has a heavy riparian fuel bed leading into the community from the wildlands

Fire Department Concerns:

- Ingress and egress
 - Ocean View Rd with no outlet
 - Potential bottlenecks with fire response vehicles going in and residents going out
 - Round Valley Rd is currently closed, causing longer response times
- Lack of defensible space in the community
 - Improper propane tank and woodpile clearance
- Compliance with evacuation orders
- Trees and/or branches leaning on power poles and lines

2



1

2 **Figure D.2. 40 Acres.**

DRAFT

40 ACRES PARCEL-LEVEL ASSESSMENT SUMMARIES

In addition to the overall community assessment, SWCA conducted parcel-level assessments for 40 Acres (Figure D.3). Several homeowners invited SWCA to walk around their property to get a more thorough assessment. These homeowners also gave SWCA permission to include assessments of their properties in the CWPP. The parcels were assessed with the NFPA 1144 form and each section in the form was given a rating. However, since the community is compact and relatively homogeneous throughout, many of the features received the same rating. For example, features like road width, road grade, fire access, street signs, topography, fire history, and distance from fire station received the same rating. To reduce repetition, only those features that are unique to each parcel are presented here.

In general, for those parcels that SWCA did not enter the premises, the parcels exhibited limited defensible space, combustible construction materials (siding, decks, fences, and roofs), and improper placement of woodpiles and propane tanks. On the other hand, several of the parcels that SWCA was invited to assess had relatively good defensible space, more integration of fire-resistant materials (siding, roofs, decks, and fences), and better placement of woodpiles and propane tanks. Moreover, the owners of these properties were proactive in fire risk reduction in and around their properties.



Figure D.3. Parcels within 40 Acres.

120 OCEAN VIEW RD ASSESSMENT SUMMARY

Property assessed:	120 Ocean View Rd & 118* Ocean View Rd
Total score:	51 (Moderate)
Defensible space:	<ul style="list-style-type: none"> • Good defensible space around property • Tree branches around the back are touching the house
Roofing materials:	<ul style="list-style-type: none"> • Fire-resistive roofing materials
Building construction:	<ul style="list-style-type: none"> • Mostly fire-resistive materials; could use finer mesh screens and vent covers
Deck and fencing:	<ul style="list-style-type: none"> • Wooden fencing • Deck is made of Trex • Woodpiles underneath deck
Adjacent structures:	<ul style="list-style-type: none"> • Good separation between structures
Water source:	<ul style="list-style-type: none"> • Underground tank with 2-inch hose • Ditch that runs through property • Pond
Vegetation:	<ul style="list-style-type: none"> • Some trees on the property; maintained yard and lawn; some ornamentals • There is mulch present on the yard to limit shrub growth; vines close to shed; woodpiles next to wooden shed and propane tank; firewood placed next to wooden fence
Placement of gas and electric utilities:	<ul style="list-style-type: none"> • Both are above ground
Values at risk:	<ul style="list-style-type: none"> • Residential • Solar panels
Other notes:	<ul style="list-style-type: none"> • Exposed on the east side to shrubland fuels, but the road acts as a fuel break

1 *The 120 property was assessed up close and the 118 property (Airbnb) was evaluated from a distance.

2 **SUMMARY OF MITIGATION NEEDS BASED ON FIELD**
 3 **ASSESSMENTS**

- 4
- Install finer mesh screens and vent covers
- 5
- Remove woodpiles from underneath decks and away from wooden fences/sheds and propane tanks
- 6
- Install gutter shields to limit buildup of leaf litter
- 7
- Remove vines that are encroaching on structures
- 8
- Reduce tree to structure contact by trimming back branches that are in contact
- 9
- Continue implementation of defensible space
- 10



- 1
- 2
- 3
- 4
- 5
- 6

Figure D.4. 118 and 120 Ocean View Rd properties. The structures have good defensible space and are accessible from Ocean View Rd and Round Valley Rd. The blue boundary is the parcel boundary.

Source: Google Earth. Acquisition date: 09/2019.

1 1441 BIRCHIM LANE ASSESSMENT SUMMARY

Property assessed:	1441 Birchim Lane
Total score:	89 (High)
Defensible space:	<ul style="list-style-type: none"> Limited defensible space around property
Roofing materials:	<ul style="list-style-type: none"> Non-combustible roofing materials
Building construction:	<ul style="list-style-type: none"> Combustible siding materials
Deck and fencing:	<ul style="list-style-type: none"> Wooden fence is far from property
Adjacent structures:	<ul style="list-style-type: none"> Generally good separation of structures, but some structures are close to each other
Water source:	<ul style="list-style-type: none"> Ditch and pond
Vegetation:	<ul style="list-style-type: none"> Mostly trees
Placement of gas and electric utilities:	<ul style="list-style-type: none"> Both are above ground
Values at risk:	<ul style="list-style-type: none"> Residential
Other notes:	<ul style="list-style-type: none"> Propane tank is close to the home Adjacent property has a big wood pile and dead branches on the fence

2 SUMMARY OF MITIGATION NEEDS BASED ON FIELD 3 ASSESSMENTS

- 4 • Continue to implement defensible space standards around all the structures
- 5 ○ Keep combustible materials to a safe distance from the home (more than 30 feet)
- 6 • Continue to do fuel reductions around the property
- 7 • Work with 40 Acres Fire Safe Council to explore options to work with the neighbor to relocate
- 8 combustible materials
- 9 • Investigate options to harden the home and other structures



1
2
3
4
5
6
7

Figure D.5. 1441 Birchim Lane property. This image was taken prior to the defensible space work that had recently been conducted. Our field assessment on 10/29/2022 noted improvements in defensible space. The property is accessible only via a single-lane road that connects to Birchim Lane. The blue boundary is the parcel boundary.

Source: Google Earth. Acquisition date: 09/2019.

1 **160 OCEAN VIEW RD ASSESSMENT SUMMARY**

Property assessed:	160 Ocean View Rd
Total score:	80 (High)
Defensible space:	<ul style="list-style-type: none"> • Good defensible space
Roofing materials:	<ul style="list-style-type: none"> • Fire-resistive roofing materials
Building construction:	<ul style="list-style-type: none"> • Mostly combustible (3-4 sides with wood)
Deck and fencing:	<ul style="list-style-type: none"> • Non-combustible deck and fence
Adjacent structures:	<ul style="list-style-type: none"> • Separation between structures is generally good
Water source:	<ul style="list-style-type: none"> • Ditch
Vegetation:	<ul style="list-style-type: none"> • Trees, lawn, ornamental, conifers, sparse shrubs
Placement of gas and electric utilities:	<ul style="list-style-type: none"> • Both above ground
Values at risk:	<ul style="list-style-type: none"> • Residential
Other notes:	<ul style="list-style-type: none"> • Potential for soffit ember intrusion • Firewood is away from the house and has a metal covering

2 **SUMMARY OF MITIGATION NEEDS BASED ON FIELD**
 3 **ASSESSMENTS**

- 4
- Continue implementation of defensible space
- 5
- Continue with structural hardening efforts
- 6



- 1
- 2
- 3
- 4
- 5

Figure D.6. 160 Ocean View Rd property. Structures have good defensible space, and Ocean View Rd is the only point of access to the property. The blue boundary is the parcel boundary.

Source: Google Earth. Acquisition date: 09/2019.

DRAFT

1 **180 OCEAN VIEW RD ASSESSMENT SUMMARY**

Property assessed:	180 Ocean View Rd
Total score:	79 (High)
Defensible space:	<ul style="list-style-type: none"> • Good defensible space
Roofing materials:	<ul style="list-style-type: none"> • Fire-resistive roofing materials
Building construction:	<ul style="list-style-type: none"> • Mostly combustible materials
Deck and fencing:	<ul style="list-style-type: none"> • Non-combustible deck and fence
Adjacent structures:	<ul style="list-style-type: none"> • Separation between structures is generally good
Water source:	<ul style="list-style-type: none"> • Ponds, ditch
Vegetations:	<ul style="list-style-type: none"> • Trees, lawn, ornamental, conifers, sparse shrubs
Placement of gas and electric utilities:	<ul style="list-style-type: none"> • Both above ground
Values at risk:	<ul style="list-style-type: none"> • Residential
Other notes:	<ul style="list-style-type: none"> • Good separation from propane tanks • The bottom siding of house is concrete • Woodpiles are well maintained and separated from the house • Good water flow on ditch outside of property

2 **SUMMARY OF MITIGATION NEEDS BASED ON FIELD**
 3 **ASSESSMENTS**

- 4
- Continue implementation of defensible space
- 5
- Continue with structural hardening efforts
- 6



- 1
- 2
- 3
- 4
- 5

Figure D.7. 180 Ocean View Rd property. Structures have good defensible space. Ocean View Rd is the only point of access to the property. The blue boundary is the parcel boundary.

Source: Google Earth. Acquisition date: 09/2019.

DRAFT

1 **220 OCEAN VIEW RD ASSESSMENT SUMMARY**

Property assessed:	220 Ocean View Rd
Total score:	84 (High)
Defensible space:	<ul style="list-style-type: none"> Defensible space is fair, some branches in contact with the roof
Roofing materials:	<ul style="list-style-type: none"> Fire-resistive roofing materials
Building construction:	<ul style="list-style-type: none"> Combustible siding materials
Deck and fencing:	<ul style="list-style-type: none"> Combustible deck and fence
Adjacent structures:	<ul style="list-style-type: none"> Structures are close to each other
Water source:	<ul style="list-style-type: none"> Pond, ditch
Vegetation:	<ul style="list-style-type: none"> Lawn with trees Overhanging tree from adjacent property
Placement of gas and electric utilities:	<ul style="list-style-type: none"> Both above ground
Values at risk:	<ul style="list-style-type: none"> Residential
Other notes:	<ul style="list-style-type: none"> Woodpile on porch

2 **SUMMARY OF MITIGATION NEEDS BASED ON FIELD**
 3 **ASSESSMENTS**

- 4
- Continue to maintain defensible space
 - Relocate woodpiles to a safe distance (more than 30 feet) from the home
 - 6 • Investigate opportunities to harden the home
 - 7 ○ Upgrade siding materials
 - 8 ○ Upgrade deck and fence materials
- 9



1
2
3
4
5
6

Figure D.8. 220 Ocean View Rd property. Defensible space is fair, although some branches are in contact with the roof. The property is located just before the dead-end road comes to an end. The blue boundary is the parcel boundary.

Source: Google Earth. Acquisition date: 09/2019.

DRAFT

1 **33 OCEAN VIEW RD ASSESSMENT SUMMARY**

Property assessed:	33 Ocean View Rd
Total score:	73 (High)
Defensible space:	<ul style="list-style-type: none"> • Good defensible space
Roofing materials:	<ul style="list-style-type: none"> • Fire resistive roofing materials
Building construction:	<ul style="list-style-type: none"> • Combustible siding materials
Deck and fencing:	<ul style="list-style-type: none"> • Non-combustible deck and fencing materials
Adjacent structures:	<ul style="list-style-type: none"> • Adjacent structures have relatively good separation
Water source:	<ul style="list-style-type: none"> • Ditch
Vegetation notes:	<ul style="list-style-type: none"> • Trees and lawn
Placement of gas and electric utilities:	<ul style="list-style-type: none"> • Both above ground
Values at risk:	<ul style="list-style-type: none"> • Residential
Other notes:	--

2 **SUMMARY OF MITIGATION NEEDS BASED ON FIELD**
 3 **ASSESSMENTS**

- 4
- Continue maintenance of defensible space
- 5
- Explore opportunities to harden the home (siding materials)
- 6



1
2
3
4
5
6

Figure D.9. 33 Ocean View property. Structures have good defensible space. The property is accessible from Ocean View Rd and is very close to Round Valley Rd. The blue boundary is the parcel boundary.

Source: Google Earth. Acquisition date: 09/2019.

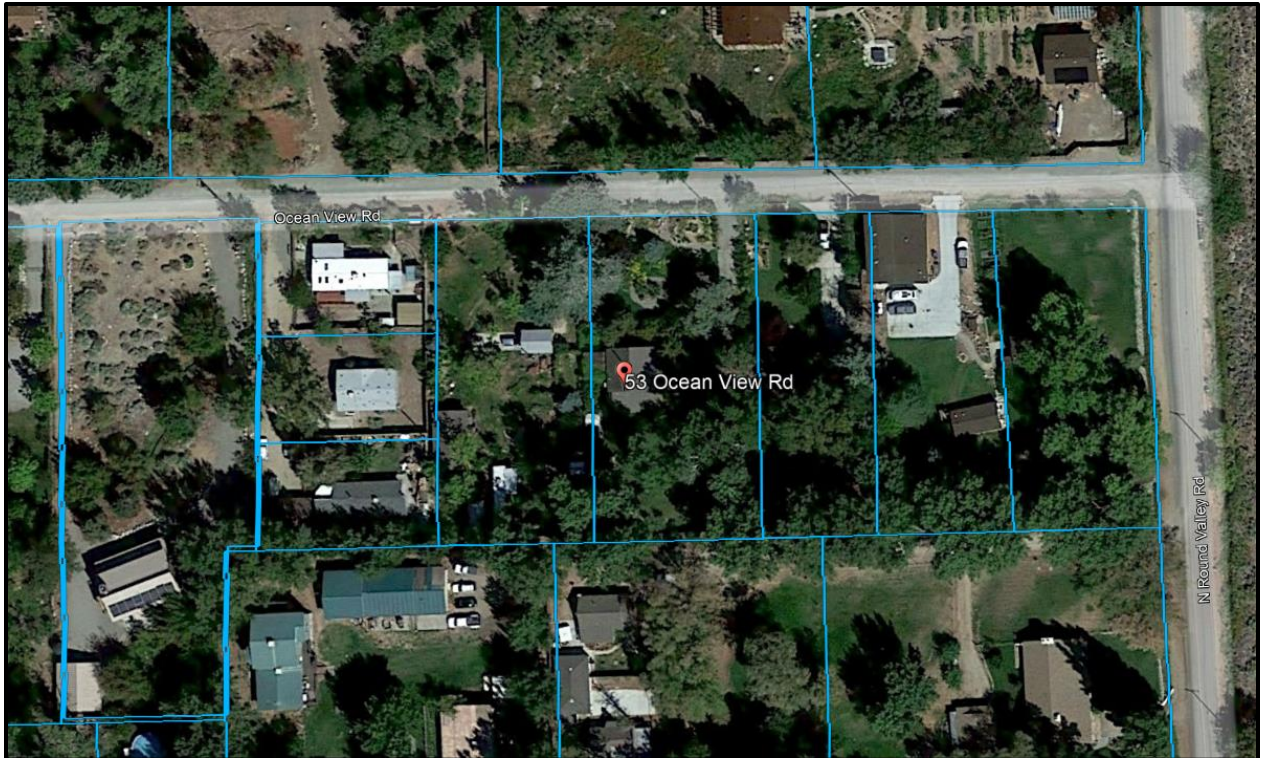
DRAFT

1 53 OCEAN VIEW RD ASSESSMENT SUMMARY

Property assessed:	53 Ocean View Rd
Total score:	108 (High)
Defensible space:	<ul style="list-style-type: none"> • Poor defensible space
Roofing materials:	<ul style="list-style-type: none"> • Fire-resistive roofing materials
Building construction:	<ul style="list-style-type: none"> • Combustible siding materials
Deck and fencing:	<ul style="list-style-type: none"> • Combustible deck and fencing materials
Adjacent structures:	<ul style="list-style-type: none"> • Structures are close to each other
Water source:	<ul style="list-style-type: none"> • Ditch
Vegetation:	<ul style="list-style-type: none"> • Trees and thick stands of ornamental vegetation
Placement of gas and electric utilities:	<ul style="list-style-type: none"> • Both above ground
Values at risk:	<ul style="list-style-type: none"> • Residential
Notes:	<ul style="list-style-type: none"> • --

2 SUMMARY OF MITIGATION NEEDS BASED ON FIELD 3 ASSESSMENTS

- 4 • Implement defensible space standards around all the structures
- 5 • Investigate opportunities to harden the home
 - 6 ○ Upgrade siding materials
 - 7 ○ Upgrade deck and fence materials
- 8



1
2
3
4
5
6
7

Figure D.10. 53 Ocean View Rd property. Structures have poor defensible space, with some branches resting on the roof. Wooden deck and fence in the southwest corner are connected to vegetation. The property is accessible only via Ocean View Rd. The blue boundary is the parcel boundary.

Source: Google Earth. Acquisition date: 09/2019.

1 **148 OCEAN VIEW RD ASSESSMENT SUMMARY**

Property assessed:	148 Ocean View Rd
Total score:	84 (High)
Defensible space:	<ul style="list-style-type: none"> Limited defensible space Woodpiles adjacent to house
Roofing materials:	<ul style="list-style-type: none"> Fire-resistive roofing materials
Building construction:	<ul style="list-style-type: none"> Fire-resistive siding materials: stucco mixed with wood
Deck and fencing:	<ul style="list-style-type: none"> Combustible deck and fencing materials
Adjacent structures:	<ul style="list-style-type: none"> Structures are close to each other
Water source:	<ul style="list-style-type: none"> Ditch, pond, and water tank
Vegetation:	<ul style="list-style-type: none"> Tall trees and lawn
Placement of gas and electric utilities:	<ul style="list-style-type: none"> Both above ground
Values at risk:	<ul style="list-style-type: none"> Residential Livestock
Notes:	<ul style="list-style-type: none"> Garage is made of cinder blocks

2 **SUMMARY OF MITIGATION NEEDS BASED ON FIELD**
 3 **ASSESSMENTS**

- 4
- Implement defensible space standards around all the structures
 - Relocate woodpiles to a safe distance (more than 30 feet) from the home
 - Investigate opportunities to harden the home
 - Upgrade siding materials (wood portion)
 - Upgrade deck and fence materials
- 7
- 8
- 9



1
2
3
4
5
6

Figure D.11. 148 Ocean View Rd property. Structures have limited defensible space, with some branches contacting roofs. The property is accessible only via Ocean View Rd. The blue boundary is the parcel boundary.

Source: Google Earth. Acquisition date: 09/2019.

DRAFT

1 137 OCEAN VIEW RD ASSESSMENT SUMMARY

Property assessed:	137 Ocean View Rd
Total score:	78 (High)
Defensible space:	<ul style="list-style-type: none"> Defensible space is fair, some branches in contact with the roof and siding
Roofing materials:	<ul style="list-style-type: none"> Fire-resistive roofing materials
Building construction:	<ul style="list-style-type: none"> Fire-resistive siding materials
Deck and fencing:	<ul style="list-style-type: none"> Non-combustible deck and fence
Adjacent structures:	<ul style="list-style-type: none"> Structures are close to each other
Water source:	<ul style="list-style-type: none"> Tank
Vegetation:	<ul style="list-style-type: none"> Trees and grass
Placement of gas and electric utilities:	<ul style="list-style-type: none"> Both above ground
Values at risk:	<ul style="list-style-type: none"> Residential
Other notes:	--

2 SUMMARY OF MITIGATION NEEDS BASED ON FIELD 3 ASSESSMENTS

- 4
- Continue to implement defensible space standards around all the structures
 - Relocate woodpiles and other objects to a safe distance (more than 30 feet) from the home. If 30 feet is not possible for woodpiles, consider installing a fire-resistant barrier.
 - Keep branches 10 feet away from the roof
- 5
6
7
8



1
2 **Figure D.12. 137 Ocean View Rd property. Defensible space is fair, although some branches are in**
3 **contact with the roof and siding. A water tank on the property is accessible via the driveway on**
4 **the west side. The property is accessible only via Ocean View Rd. The blue boundary is the parcel**
5 **boundary.**

6 Source: Google Earth. Acquisition date: 09/2019.

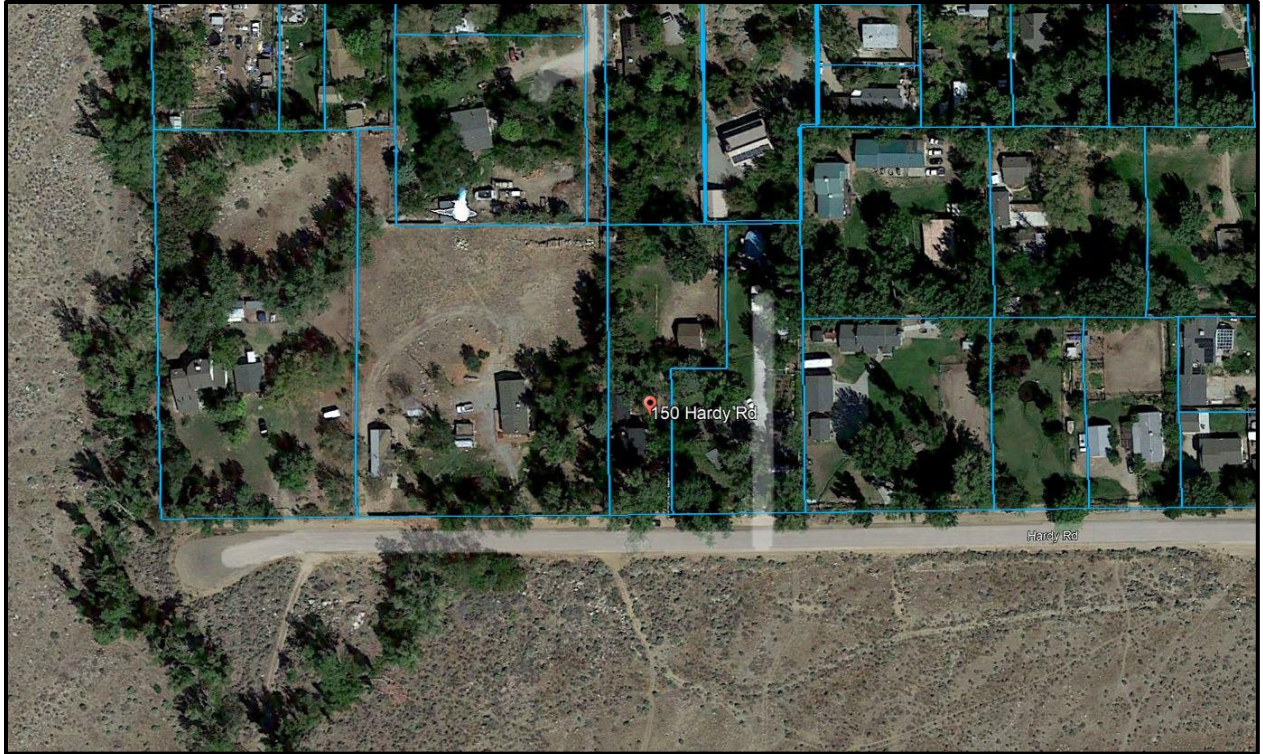
7

1 **150 HARDY RD ASSESSMENT SUMMARY**

Property assessed:	150 Hardy Rd
Total score:	83 (High)
Defensible space:	<ul style="list-style-type: none"> • Defensible space is limited • Large trees are very close to the home; tree crown is touching the roof • Propane tank is close to the home
Roofing materials:	<ul style="list-style-type: none"> • Fire-resistive roofing materials
Building construction:	<ul style="list-style-type: none"> • Combustible siding materials
Deck and fencing:	<ul style="list-style-type: none"> • Combustible deck and fence materials (fence has mixed materials: wood and metal)
Adjacent structures:	<ul style="list-style-type: none"> • Structures within the property have good separation
Water source:	<ul style="list-style-type: none"> • Ditch and pond
Vegetation:	<ul style="list-style-type: none"> • Trees and grass; grass is well maintained • Exposed to shrubland fuels across Hardy Rd
Placement of gas and electric utilities:	<ul style="list-style-type: none"> • Both above ground
Values at risk:	<ul style="list-style-type: none"> • Residential
Other notes:	--

2 **SUMMARY OF MITIGATION NEEDS BASED ON FIELD**
 3 **ASSESSMENTS**

- 4
- Continue to implement defensible space standards around all the structures
 - Keep branches and tree crowns 10 feet away from the roof
 - Work with the Fire Safe Council to explore opportunities to remove trees that are too close to the home
- 5
- 6
- 7
- 8
- Investigate opportunities to harden the home
 - Upgrade siding materials
 - Upgrade deck and fence materials
- 9
- 10
- 11



1
2
3
4
5
6
7

Figure D.13. 150 Hardy Rd property. Defensible space is limited, with large trees in contact with the home. The property is accessible only via Hardy Rd, a relatively wide and paved road. The blue boundary is the parcel boundary.

Source: Google Earth. Acquisition date: 09/2019.

1 *This page intentionally left blank.*

2

DRAFT

ASPCA

APPENDIX E:
NFPA 1144 Assessment Forms

This page intentionally left blank.

1 1144 NATIONAL FIRE PROTECTION ASSOCIATION
 2 ASSESSMENT FORM

SWCA – 1144 Assessment	
Community	Notes:
Surveyor	
Survey Date/Time	
Means of Access	
<i>Ingress and Egress</i>	
2 or more roads in and out score 0	
1 road in and out 7	
<i>Road Width</i>	
> 24 ft 0	
> 20 ft < 24 ft 2	
< 20 ft 4	
<i>Road Conditions</i>	
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	
<i>Fire Access</i>	
< 300 ft with turnaround 0	
> 300 ft with turnaround 2	
< 300 ft with no turnaround 4	
> 300 ft with no turnaround 5	
<i>Street Signs</i>	
Present – reflective 0	
Present – non-reflective 2	
Not present 5	
Notes:	
Vegetation (Fuel Models)	
<i>Predominant Vegetation</i>	
<i>Primary Predominant Vegetation</i>	
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

1 *This page intentionally left blank.*

DRAFT

SWAC

APPENDIX F: Funding Sources

This page intentionally left blank.

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?msckid=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/>

- 1 **Source:** **Building Resilient Infrastructure and Communities (BRIC) Grant Program**
- 2 **Agency:** Department of Homeland Security (DHS) Federal Emergency Management Agency
3 (FEMA)
- 4 **Website:** <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>
- 5 **Description:** BRIC will support states, local communities, tribes, and territories as they undertake
6 hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC
7 program guiding principles are supporting communities through capability- and capacity-building;
8 encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining
9 flexibility; and providing consistency. You can find more information on the BRIC program here:
10 <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>
- 11 **Source:** **Hazard Mitigation Grant Program (HMGP)**
- 12 **Agency:** FEMA
- 13 **Website:** <https://www.fema.gov/grants/mitigation/hazard-mitigation>
- 14 **Description:** The HMGP provides funding to state, local, tribal, or territorial governments (and
15 individuals or businesses if the community applies on their behalf) to rebuild with the intentions to
16 mitigate future losses due to potential disasters. This grant program is available after a presidentially
17 declared disaster.
- 18 **Source:** **Hazard Mitigation Grant Program (HMGP) – Post Fire**
- 19 **Agency:** FEMA
- 20 **Website:** <https://www.fema.gov/grants/mitigation/post-fire>
- 21 **Description:** The HMGP Post Fire grant program provides assistance to communities for the
22 purpose of implementing hazard mitigation measures following a wildfire. Mitigation measures may
23 include:
- 24 • Soil stabilization
- 25 • Flood diversion
- 26 • Reforestation
- 27 **Source:** **Flood Mitigation Assistance (FMA) Grant**
- 28 **Agency:** FEMA
- 29 **Website:** <https://www.fema.gov/grants/mitigation/floods>
- 30 **Description:** The Flood Mitigation Assistance Program is a competitive grant program that provides
31 funding to states, local communities, federally recognized tribes, and territories. Funds can be used
32 for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the
33 National Flood Insurance Program. FEMA chooses recipients based on the applicant's ranking of the
34 project and the eligibility and cost-effectiveness of the project.
- 35 **Source:** **Emergency Management Performance Grant (EMPG)**
- 36 **Agency:** FEMA
- 37 **Website:** <https://www.fema.gov/grants/preparedness/emergency-management-performance>

1 **Description:** The EMPG program provides funding to state, local, tribal, and territorial emergency
2 management agencies with the overall goal of creating a safe and resilient nation. The two main
3 objectives of the program are 1) closing capability gaps that are identified in the state or territory's
4 most recent Stakeholder Preparedness Review (SPR); and 2) building or sustaining those capabilities
5 that are identified as high priority through the Threat and Hazard Identification and Risk Assessment
6 (THIRA)/SPR process and other relevant information sources. The grant recipient and Regional
7 Administrator must come to an agreement on program priorities, which are crafted based on National,
8 State, and regional priorities.

9 **Source: Fire Management Assistance Grant (FMAG)**

10 **Agency:** FEMA

11 **Website:** <https://www.fema.gov/assistance/public/fire-management-assistance>

12 **Description:** Fire Management Assistance is available to state, local, and tribal governments for the
13 mitigation, management, and control of fires on publicly or privately owned forests or grasslands,
14 which threaten such destruction as would constitute a major disaster. The Fire Management
15 Assistance declaration process is initiated when a state submits a request for assistance to the FEMA
16 Regional Director at the time a "threat of major disaster" exists. The entire process is accomplished
17 on an expedited basis and a FEMA decision is rendered in a matter of hours. Before a grant can be
18 awarded, a state must demonstrate that total eligible costs for the declared fire meet or exceed either
19 the individual fire cost threshold, which applies to single fires, or the cumulative fire cost threshold,
20 which recognizes numerous smaller fires burning throughout a state.

21 **Source: Regional Catastrophic Preparedness (RCP) Grants**

22 **Agency:** FEMA

23 **Website:** <https://www.fema.gov/grants/preparedness/regional-catastrophic>

24 **Description:** The Regional Catastrophic Preparedness Grant program provides funding to increase
25 collaboration and capacity in regard to catastrophic incident response and preparation.

26 **Source: Emergency Forest Restoration Program (EFRP)**

27 **Agency:** USDA Farm Service Agency (FSA)

28 **Website:** [https://www.fsa.usda.gov/programs-and-services/disaster-assistance-
29 program/emergency-forest-restoration/index](https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/emergency-forest-restoration/index)

30 **Description:** The Emergency Forest Restoration Program (EFRP) helps the owners of non-industrial
31 private forests restore forest health damaged by natural disasters. The EFRP does this by authorizing
32 payments to owners of private forests to restore disaster damaged forests. The local FSA County
33 Committee implements EFRP for all disasters with the exceptions of drought and insect infestations.
34 Eligible practices may include debris removal, such as down or damaged trees; site preparation,
35 planting materials, and labor to replant forest stand; restoration of forestland roads, fire lanes, fuel
36 breaks, or erosion-control structures; fencing, tree shelters; wildlife enhancement.

37 To be eligible for EFRP, the land must have existing tree cover; and be owned by any nonindustrial
38 private individual, group, association, corporation, or other private legal entity.

1 **Source: Emergency Conservation Program (ECP)**

2 **Agency:** USDA Farm Service Agency (FSA)

3 **Website:** [https://www.fsa.usda.gov/programs-and-services/conservation-programs/emergency-](https://www.fsa.usda.gov/programs-and-services/conservation-programs/emergency-conservation/index)
4 [conservation/index](https://www.fsa.usda.gov/programs-and-services/conservation-programs/emergency-conservation/index)

5 **Description:** The Emergency Conservation Program (ECP) helps farmers and ranchers to repair
6 damage to farmlands caused by natural disasters and to help put in place methods for water
7 conservation during severe drought. The ECP does this by giving ranchers and farmers funding and
8 assistance to repair the damaged farmland or to install methods for water conservation. The grant
9 could be used for restoring conservation structures (waterways, diversion ditches, buried irrigation
10 mainlines, and permanently installed ditching system).

11 **Source: Environmental Quality Incentives Program (EQIP)**

12 **Agency:** National Resource Conservation Service (NRCS)

13 **Website:** <https://www.nrcs.usda.gov/wps/portal/nrcs/main/co/programs/financial/eqip/>

14 **Description:** The Environmental Quality Incentives Program (EQIP) is a voluntary program
15 authorized under the Agricultural Act of 2014 (2014 Farm Bill) that helps farmers, ranchers and forest
16 landowners who own or rent agricultural land to implement practices and/or install measures to
17 protect soil, water, plant, wildlife, and other natural resources while ensuring sustainable production
18 on their farms, ranches, and working forest lands. California EQUIP ranking pools include
19 [Catastrophic Fire Recovery](#) and [Forest Tree Mortality](#).

20 **Source: Emergency Watershed Protection (EWP) Program**

21 **Agency:** National Resource Conservation Service (NRCS)

22 **Website:** <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/>

23 **Description:** The program offers technical and financial assistance to help local communities relieve
24 imminent threats to life and property caused by floods, fires, windstorms, and other natural disasters
25 that impair a watershed.

26 Eligible sponsors include cities, counties, towns, conservation districts, or any federally recognized
27 Native American tribe or tribal organization. Interested public and private landowners can apply for
28 EWP Program recovery assistance through one of those sponsors.

29 The EWP Program covers the following activities.

- 30 • Debris removal from stream channels, road culverts, and bridges
- 31 • Reshape and protect eroded streambanks
- 32 • Correct damaged drainage facilities
- 33 • Establish vegetative cover on critically eroded lands
- 34 • Repair levees and structures
- 35 • Repair conservation practices

1 **Source: Funding for Fire Departments and First Responders**

2 **Agency:** DHS, U.S. Fire Administration

3 **Website:** <https://www.usfa.fema.gov/grants/>

4 **Description:** Includes grants and general information on financial assistance for fire departments and
5 first responders. Programs include the Assistance to Firefighters Grant Program, Reimbursement for
6 Firefighting on Federal Property, State Fire Training Systems Grants, and National Fire Academy
7 Training Assistance.

8 **Source: Tribal Environmental General Assistance Program (GAP)**

9 **Agency:** Environmental Protection Agency (EPA)

10 **Website:** <https://www.epa.gov/tribal-pacific-sw/epa-region-9-tribal-environmental-gap-funding>

11 **Description:** Funding under this program is used to aid Native American tribes in establishing and
12 implementing their own reservation-specific environmental protection programs. To find out more
13 about this funding opportunity please contact Tribal Branch Manager, Jeremy Bauer, at
14 bauer.jeremy@epa.gov.

15 **Source: Specific EPA Grant Programs**

16 **Agency:** Environmental Protection Agency (EPA)

17 **Website:** <https://www.epa.gov/tribal-pacific-sw/epa-region-9-tribal-environmental-gap-funding>

18 **Description:** Various grant programs are listed under this site. Listed below are examples of grants
19 offered:

- 20 • Multipurpose Grants to States and Tribes: [https://www.epa.gov/grants/multipurpose-](https://www.epa.gov/grants/multipurpose-grants-states-and-tribes)
21 [grants-states-and-tribes](https://www.epa.gov/grants/multipurpose-grants-states-and-tribes)
- 22 • Environmental Education Grants: <https://www.epa.gov/education/grants>
- 23 • Environmental Justice Grants: [https://www.epa.gov/environmentaljustice/environmental-](https://www.epa.gov/environmentaljustice/environmental-justice-grants-funding-and-technical-assistance)
24 [justice-grants-funding-and-technical-assistance](https://www.epa.gov/environmentaljustice/environmental-justice-grants-funding-and-technical-assistance)

25 **Source: Conservation Innovation Grants (CIG)**

26 **Agency:** National Resource Conservation Service

27 **Website:** [Conservation Innovation Grant \(CIG\) | NRCS California \(usda.gov\)](#)

28 **Description:** CIG State Component. CIG is a voluntary program intended to stimulate the
29 development and adoption of innovative conservation approaches and technologies while leveraging
30 federal investment in environmental enhancement and protection, in conjunction with agricultural
31 production. Under CIG, Environmental Quality Incentives Program (EQIP) funds are used to award
32 competitive grants to non-federal governmental or nongovernmental organizations, tribes, or
33 individuals. CIG enables the Natural Resources Conservation Service (NRCS) to work with other
34 public and private entities to accelerate technology transfer and adoption of promising technologies
35 and approaches to address some of the nation's most pressing natural resource concerns. CIG will
36 benefit agricultural producers by providing more options for environmental enhancement and
37 compliance with federal, state, and local regulations. The NRCS administers the CIG program.
38 The CIG requires a 50/50 match between the agency and the applicant. The CIG has two funding

1 components: national and state. Funding sources are available for water resources, soil resources,
2 atmospheric resources, and grazing land and forest health.

3 **Source:** Urban and Community Forestry Program, National Urban and Community Forestry
4 Challenge Cost Share Grant Program

5 **Agency:** U.S. Forest Service

6 **Website:** <https://www.fs.usda.gov/managing-land/urban-forests/ucf>

7 **Description:** U.S. Forest Service funding will provide for Urban and Community Forestry Programs
8 that work with local communities to establish climate-resilient tree species to promote long-term forest
9 health. The other initiative behind this program is to promote and carry out disaster risk mitigation
10 activities, with priority given to environmental justice communities. For more information, contact a
11 Forest Service Regional Program Manager.

12 **Source:** Catalog of Federal Funding Sources; Land Resources

13 **Agency:** Multiple

14 **Website:** <https://ordspub.epa.gov/ords/wfc/f?p=165:512:10535656593775:::512::>

15 **Description:** The Land Finance Clearing House is a catalogue of Federal funding sources for all
16 things land related.

17 Examples of the types of grants found at this site are:

- 18 • Forest and Woodlands Resource Management Grant:
19 [https://sam.gov/fal/a798ad78cac749639b48270db3e86fdc/view?index=cfda&page=2&org](https://sam.gov/fal/a798ad78cac749639b48270db3e86fdc/view?index=cfda&page=2&organization_id=100011100)
20 [anization_id=100011100](https://sam.gov/fal/a798ad78cac749639b48270db3e86fdc/view?index=cfda&page=2&organization_id=100011100)
- 21 • Environmental Education Grant: <https://www.epa.gov/education/grants>
- 22 • Public Assistance Grant Program: <https://www.fema.gov/assistance/public>
- 23 • Hazard Mitigation Grant: <https://www.fema.gov/grants/mitigation/hazard-mitigation>

24 **Source:** Catalog of Federal Funding Sources; Water Resources

25 **Agency:** Multiple

26 **Website:** <https://ofmpub.epa.gov/apex/wfc/f?p=165:12:6483383318137:::12::>

27 **Description:** The Water Finance Clearing House is a catalogue of Federal funding sources for all
28 things water related.

29 Examples of the types of grants found at this site are:

- 30 • Water Conservation Field Services Program: <https://www.usbr.gov/waterconservation/>
- 31 • California Community Development Block Grant:
32 <https://www.grants.ca.gov/grants/community-development-block-grant-cdbg/>
- 33 • California Clean Water State Revolving Fund Program (CWSRF):
34 https://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/index.html

1 **Source: Firewise Communities**

2 **Agency:** Multiple

3 **Website:** <http://www.firewise.org>

4 **Description:** Many different Firewise Communities activities are available to help homes and whole
5 neighborhoods become safer from wildfire without significant expense. Community cleanup days,
6 awareness events, and other cooperative activities can often be successfully accomplished through
7 partnerships among neighbors, local businesses, and local fire departments at little or no cost.

8 The kind of help you need will depend on who you are, where you are, and what you want to do.
9 Among the different activities that individuals and neighborhoods can undertake, the following often
10 benefit from seed funding or additional assistance from an outside source:

- 11 • Thinning/pruning/tree removal/clearing on private property—particularly on very large,
12 densely wooded properties
- 13 • Retrofit of home roofing or siding to non-combustible materials
- 14 • Managing private forest
- 15 • Community slash pickup or chipping
- 16 • Creation or improvement of access/egress roads
- 17 • Improvement of water supply for firefighting
- 18 • Public education activities throughout the community or region

19 **Source: The National Fire Plan (NFP)**

20 **Agency:** DOI & USDA

21 **Website:** <http://www.forestsandrangelands.gov/>

22 **Description:** Many states are using funds from the NFP to provide funds through a cost-share with
23 residents to help them reduce the wildfire risk to their private property. These actions are usually in
24 the form of thinning or pruning trees, shrubs, and other vegetation and/or clearing the slash and
25 debris from this kind of work. Opportunities are available for rural, state, and volunteer fire assistance.

26 **Source: Staffing for Adequate Fire and Emergency Response (SAFER)**

27 **Agency:** FEMA

28 **Website:** <https://www.fema.gov/grants/preparedness/firefighters/safer>

29 **Description:** The purpose of SAFER grants is to help fire departments increase the number of
30 frontline firefighters. The goal is for fire departments to increase their staffing and deployment
31 capabilities and ultimately attain 24-hour staffing, thus ensuring that their communities have adequate
32 protection from fire and fire-related hazards. The SAFER grants support two specific activities:
33 (1) hiring of firefighters and (2) recruitment and retention of volunteer firefighters. The hiring of
34 firefighters activity provides grants to pay for part of the salaries of newly hired firefighters over the
35 five-year program.

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

2 **Agency:** FEMA

3 **Website:** <https://www.fema.gov/grants/preparedness/firefighters/safety-awards>

4 **Description:** FP&S offers support to projects that enhance the safety of the public and firefighters
5 who may be exposed to fire and related hazards. The primary goal is to target high risk populations
6 and mitigate high incidences of death and injury. Examples of the types of projects supported by
7 FP&S include fire-prevention and public-safety education campaigns, juvenile fire-setter interventions,
8 media campaigns, and arson prevention and awareness programs. In fiscal year 2005, Congress
9 reauthorized funding for FP&S and expanded the eligible uses of funds to include firefighter safety
10 research and development.

11 **Source: GSA-Federal Excess Personal Property**

12 **Agency:** USFS

13 **Website:** <https://gsaccess.gov/>

14 **Description:** The Federal Excess Personal Property (FEPP) program refers to Forest Service-owned
15 property that is on loan to State Foresters for the purpose of wildland and rural firefighting. Most of
16 the property originally belonged to the Department of Defense (DoD). Once acquired by the Forest
17 Service, it is loaned to State Cooperators for firefighting purposes. The property is then loaned to the
18 State Forester, who may then place it with local departments to improve local fire programs. State
19 Foresters and the USDA Forest Service have mutually participated in the FEPP program since 1956.

20 **Source: Assistance to Firefighters Grants (AFG)**

21 **Agency:** FEMA

22 **Website:** <https://www.fema.gov/grants/preparedness/firefighters>.

23 **Description:** The AFG program provides resources to assist fire departments in attaining critical
24 resources such as training and equipment.

25 STATE FUNDING INFORMATION

26 **Source: CAL FIRE Grant Programs**

27 **Agency:** CAL FIRE

28 **Website:** <https://www.fire.ca.gov/grants/>

29 **Description:** The CAL FIRE Grant Program offers a range of forest-related grants with differing
30 scopes and funding details. Some of the Grants include:

- 31 1. Forest Health Grants: <https://www.fire.ca.gov/grants/forest-health-grants/>
- 32 2. California Forest Improvement Program: <https://www.fire.ca.gov/grants/california-forest-improvement-program-cfip/>
- 33 3. Fire Prevention Grants Program: <https://www.fire.ca.gov/grants/fire-prevention-grants/>
- 34 4. Urban & Community Forestry Grant Programs: <https://www.fire.ca.gov/grants/urban-and-community-forestry-grant-programs/>
- 35
- 36

1 5. Wildfire Resilience and Forestry Assistance Grant- Prop 68: [https://www.fire.ca.gov/](https://www.fire.ca.gov/programs/resource-management/resource-protection-improvement/landowner-assistance/forest-stewardship/)
2 [programs/resource-management/resource-protection-improvement/landowner-assistance/](https://www.fire.ca.gov/programs/resource-management/resource-protection-improvement/landowner-assistance/forest-stewardship/)
3 [forest-stewardship/](https://www.fire.ca.gov/programs/resource-management/resource-protection-improvement/landowner-assistance/forest-stewardship/)

4 **Source: California Fire Safe Council Grant Programs**

5 **Agency:** California Fire Safe Council

6 **Website:** <https://cafiresafecouncil.org/grants-and-funding/apply-for-a-grant/>

7 **Description:** The California Fire Safe Council provides a range of Federal, State, and Private funding
8 sources in addition to administering the USFS State Fire Assistance (SFA) Grant Programs.

9 **Source: California Environmental Protection Agency (EPA) Loans and Grants**

10 **Agency:** Multiple

11 **Website:** <https://calepa.ca.gov/loansgrants/>

12 **Description:** The California EPA Loans and Grants hosts a wide variety of EPA grants specifically for
13 California. While these funding sources may not tie directly to fuel management or fire recovery, there
14 is a wide array of funding opportunities for water and air resources which are directly impacted by
15 wildfire.

16 **Source: Northern California Forests and Watersheds Program**

17 **Agency:** Multiple

18 **Website:** <https://www.nfwf.org/programs/northern-california-forests-and-watersheds>

19 **Description:** The National Fish and Wildlife Foundations and the U.S. Forest Service have partnered
20 to restore and enhance National Forests and watersheds affected by wildfires in northern California.
21 This program will administer an initial \$6 million in grants to projects that increase wildfire resiliency
22 for northern California National Forests and watersheds.

23 **Source: Adaptation Clearinghouse**

24 **Agency:** Multiple

25 **Website:** <https://resilientca.org/>

26 **Description:** This resource has numerous wildfire-related resources such as funding opportunities,
27 assessments, case studies, educational materials, data and tools, example plans and strategies, and
28 additional policy guidance.

29 **Source: State of California's Grants Portal**

30 **Agency:** Multiple

31 **Website:** <https://www.grants.ca.gov/>

32 **Description:** The California Grants Portal helps users identify the latest grants that could support fire
33 hazard planning or related implementation efforts that support wildfire risk mitigation, fuels
34 management, and other related projects.

1 **Source:** **California Air Resources Board Funding Wizard**
2 **Agency:** Multiple
3 **Website:** <https://fundingwizard.arb.ca.gov/web/>
4 **Description:** The Funding Wizard aggregates current federal, state, regional, private, and other
5 funding opportunities for environmental and sustainability projects.

6 **Source:** **California Fire Foundation Grant Programs**
7 **Agency:** California Fire Foundation
8 **Website:** <https://www.cafirefoundation.org/programs/fireprevention/>
9 **Description:** The California Fire Foundation (CFF) offers grant opportunities to fire departments,
10 firefighter associations, and community-based organizations whose projects help address wildfire and
11 disaster prevention, preparedness, relief, and recovery needs within the state of California. The CFF
12 directly supports high fire threat and/or under-resourced communities.

13 **Source:** **Wildfire Recovery Fund**
14 **Agency:** California Community Foundation
15 **Website:** <https://www.calfund.org/wildfirerecoveryfund/>
16 **Description:** The Wildfire Recovery Fund supports intermediate and long-term recovery efforts for
17 major California wildfires. The Fund also supports wildfire prevention and preparedness efforts. Since
18 2003, the fund has granted more than \$32 million to support relief and recovery efforts in the
19 aftermath of destructive wildfires.

20 PRIVATE FUNDING INFORMATION

21 **Source:** **State Farm Good Neighbor Citizenship (GNC) Grants**
22 **Agency:** State Farm
23 **Website:** <https://www.statefarm.com/about-us/corporate-responsibility/community-grants/good-neighbor-citizenship-grants>
24

25 **Description:** State Farm funding is directed at:

- 26 • Auto and roadway safety
- 27 • Teen Driver Education
- 28 • Home safety and fire prevention
- 29 • Disaster preparedness
- 30 • Disaster recovery

31 **Source:** **The Urban Land Institute (ULI)**

32 **Website:** <http://www.uli.org>

33 **Description:** ULI is a 501(c)(3) nonprofit research and education organization supported by its
34 members. The institute has more than 22,000 members worldwide, representing the entire spectrum

1 of land use and real estate development disciplines, working in private enterprise and public service.
2 The mission of the ULI is to provide responsible leadership in the use of land to enhance the total
3 environment. ULI and the ULI Foundation have instituted Community Action Grants that could be
4 used for Firewise Communities activities. Applicants must be ULI members or part of a ULI District
5 Council. Contact actiongrants@uli.org or review the web page to find your District Council and the
6 application information.

7 **Source: Environmental Systems Research Institute (ESRI)**

8 **Website:** <http://www.esri.com/grants>

9 **Description:** ESRI is a privately held firm and the world's largest research and development
10 organization dedicated to geographic information systems. ESRI provides free software, hardware,
11 and training bundles under ESRI-sponsored Grants that include such activities as conservation,
12 education, and sustainable development, and posts related non-ESRI grant opportunities under such
13 categories as agriculture, education, environment, fire, public safety, and more. You can register on
14 the website to receive updates on grant opportunities.

15 **Source: National Forest Foundation; Innovative Finance for National Forests Grant**
16 **Program**

17 **Website:** [https://www.nationalforests.org/grant-programs/innovative-finance-for-national-forests-](https://www.nationalforests.org/grant-programs/innovative-finance-for-national-forests-grant-program)
18 [grant-program](https://www.nationalforests.org/grant-programs/innovative-finance-for-national-forests-grant-program)

19 **Description:** The Innovative Finance for National Forests Grant Program aims to bring in non-USFS
20 funds to increase forest resilience. There are three main topics for funding: Wildfire Resilience and
21 Recovery, Sustainable Recreation Access and Infrastructure, and Watershed Health. In addition,
22 three types of projects are funded. Pilot Programs with on-the-ground implementation, Scaling
23 Projects to deliver backlogs of unfunded work, and Research and Development to provide to new
24 forest information.

25 **Source: Matching Awards Program**

26 **Agency:** National Forest Foundation (NFF)

27 **Website:** <https://www.nationalforests.org/grant-programs/map>

28 **Description:** The NFF is soliciting proposals for its Matching Awards Program (MAP) to provide
29 funds for direct on-the-ground projects benefitting America's National Forests and Grasslands.
30 By pairing federal funds provided through a cooperative agreement with the U.S. Forest Service with
31 non-federal dollars raised by award recipients, MAP measurably multiplies the resources available to
32 implement stewardship projects that benefit the National Forest System.

33 **Source: Patagonia Environmental Grants and Support**

34 **Agency:** Patagonia

35 **Website:** <https://www.patagonia.com/how-we-fund/>

36 **Description:** Patagonia supports innovative work that addresses the root causes of the
37 environmental crisis and seeks to protect both the environment and affected communities. Patagonia
38 focuses on places where they have built connections through outdoor recreation and through their
39 network of retail stores, nationally and internationally.

- 1 **Source:** **Leonardo DiCaprio Foundation Grants**
- 2 **Agency:** Leonardo DiCaprio Foundation
- 3 **Website:** <https://www.rewild.org/>
- 4 **Description:** The foundation supports projects around the world that build climate resiliency, protect
5 vulnerable wildlife, and restore balance to threatened ecosystems and communities.
- 6 **Source:** **U.S. Endowment for Forestry and Communities**
- 7 **Agency:** U.S. Environmental Protection Agency, Natural Resources Conservation Service
8 (NRCS), U.S. Forest Service, U.S. Department of Defense, U.S. Economic Development Agency
- 9 **Website:** <https://www.usendowment.org/>
- 10 **Description:** As the nation’s largest public charity dedicated to keeping our working forests working
11 and ensuring their bounty for current and future generations, the Endowment deploys the creativity
12 and power of markets to advance their mission: The Endowment works collaboratively with partners
13 in the public and private sectors to advance systemic, transformative and sustainable change for the
14 health and vitality of the nation’s working forests and forest-reliant communities.

15 OTHER FUNDING INFORMATION

16 The following resources may also provide helpful information for funding opportunities:

- 17 • Western Forestry Leadership Coalition: <https://www.thewflc.org/>
- 18 • USDA Information Center: <https://www.nal.usda.gov/main/information-centers>
- 19 • Forest Service Fire Management website: <https://www.fs.usda.gov/managing-land/fire>
- 20 • Insurance Services Office Mitigation Online (town fire ratings): <http://www.isomitigation.com/>
- 21 • National Fire Protection Association: <http://www.nfpa.org>
- 22 • National Interagency Fire Center, Wildland Fire Prevention/Education: [https://www.nifc.gov/fire-](https://www.nifc.gov/fire-information/fire-prevention-education-mitigation)
23 [information/fire-prevention-education-mitigation](https://www.nifc.gov/fire-information/fire-prevention-education-mitigation)
- 24 • Department of Homeland Security U.S. Fire Administration: <https://www.usfa.fema.gov/index.html>
- 25

SWCA

APPENDIX G:
Homeowner Resources

This page intentionally left blank.

1 ADDITIONAL LINKS AND RESOURCES

2 CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE 3 PROTECTION (CAL FIRE)

4 Home and Fuels Management

- 5 • Homeowners Checklist; How to Make Your Home Fire Safe:
6 https://www.lakeshastina.com/Docs_PDFs/Checklist.pdf
- 7 • Hardening Your Home: [https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/hardening-](https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/hardening-your-home/)
8 [your-home/](https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/hardening-your-home/)
- 9 • Home Hardening Toolkit: [https://www.readyforwildfire.org/campaign-toolkits/home-hardening-](https://www.readyforwildfire.org/campaign-toolkits/home-hardening-toolkit/)
10 [toolkit/](https://www.readyforwildfire.org/campaign-toolkits/home-hardening-toolkit/)
- 11 • Defensible Space: [https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/defensible-](https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/defensible-space/)
12 [space/](https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/defensible-space/)
- 13 • Defensible Space Toolkit: [https://www.readyforwildfire.org/campaign-toolkits/defensible-space-](https://www.readyforwildfire.org/campaign-toolkits/defensible-space-toolkit/)
14 [toolkit/](https://www.readyforwildfire.org/campaign-toolkits/defensible-space-toolkit/)
- 15 • Fire-Resistant Landscaping: [https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/fire-](https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/fire-resistant-landscaping/)
16 [resistant-landscaping/](https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/fire-resistant-landscaping/)
- 17 • What Property Owners Need to Know to Reduce Wildfire Risk Each Season:
18 <https://www.readyforwildfire.org/forest-health/seasonal-actions/>
- 19 • Prescribed Fire Toolkit: <https://www.readyforwildfire.org/campaign-toolkits/prescribed-fires-toolkit/>

20 Preparing for Wildfire

- 21 • Wildfire Action Plan: [https://www.readyforwildfire.org/prepare-for-wildfire/get-set/wildfire-action-](https://www.readyforwildfire.org/prepare-for-wildfire/get-set/wildfire-action-plan/)
22 [plan/](https://www.readyforwildfire.org/prepare-for-wildfire/get-set/wildfire-action-plan/)
- 23 • How to Prepare to Evacuate From a Wildfire: [https://www.readyforwildfire.org/prepare-for-](https://www.readyforwildfire.org/prepare-for-wildfire/get-set/prepare-your-family/)
24 [wildfire/get-set/prepare-your-family/](https://www.readyforwildfire.org/prepare-for-wildfire/get-set/prepare-your-family/)
- 25 • Pre-Evacuation Preparation Steps: [https://www.readyforwildfire.org/prepare-for-wildfire/go-](https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/pre-evacuation-preparation-steps/)
26 [evacuation-guide/pre-evacuation-preparation-steps/](https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/pre-evacuation-preparation-steps/)
- 27 • Evacuation Steps: [https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-](https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/evacuation-steps/)
28 [guide/evacuation-steps/](https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/evacuation-steps/)
- 29 • Animal Evacuation: [https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-](https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/animal-evacuation/)
30 [guide/animal-evacuation/](https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/animal-evacuation/)
- 31 • GO! Evacuation Guide: <https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/>
- 32 • GO! Evacuation Toolkit: <https://www.readyforwildfire.org/campaign-toolkits/go-evacuation-toolkit/>
- 33 • Emergency Supply Kit: [https://www.readyforwildfire.org/prepare-for-wildfire/get-set/emergency-](https://www.readyforwildfire.org/prepare-for-wildfire/get-set/emergency-supply-kit/)
34 [supply-kit/](https://www.readyforwildfire.org/prepare-for-wildfire/get-set/emergency-supply-kit/)

- 1 • Insurance Preparedness: <https://www.readyforwildfire.org/prepare-for-wildfire/get-set/insurance-preparedness/>
- 2
- 3 • Power Outage Information: <https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/power-outage-information/>
- 4
- 5 • What To Do If Trapped: <https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/what-to-do-if-trapped/>
- 6

7 Preventing Wildfire

- 8 • Equipment Use: <https://www.readyforwildfire.org/prevent-wildfire/equipment-use/>
- 9 • Debris Burning: <https://www.readyforwildfire.org/prevent-wildfire/debris-burning/>
- 10 • Vehicle Use: <https://www.readyforwildfire.org/prevent-wildfire/vehicle-use/>
- 11 • Campfire Safety: <https://www.readyforwildfire.org/prevent-wildfire/campfire-safety/>
- 12 • Target Shooting Safety: <https://www.readyforwildfire.org/prevent-wildfire/target-shooting-safety/>
- 13 • One Less Spark, One Less Wildfire Toolkit: <https://www.readyforwildfire.org/prevent-wildfire/one-less-spark-campaign/>
- 14
- 15 • Forest Health: <https://www.readyforwildfire.org/forest-health/>
- 16 • Forest Health Toolkit: <https://www.readyforwildfire.org/campaign-toolkits/forest-health-toolkit/>

17 After the Fire

- 18 • Returning Home After a Wildfire: <https://www.readyforwildfire.org/post-wildfire/>
- 19 • What to Expect After a Wildfire: <https://www.readyforwildfire.org/post-wildfire/after-a-wildfire/>
- 20 • Immediate Safety: <https://www.readyforwildfire.org/post-wildfire/returning-home/>
- 21 • Rebuilding, Mobilizing Your Community: <https://www.readyforwildfire.org/post-wildfire/rebuilding/>
- 22 • Who Can Help? <https://www.readyforwildfire.org/post-wildfire/who-can-help/>

23 NATIONAL FIRE PROTECTION ASSOCIATION (NFPA):

24 Protecting Your Home

- 25 • 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>
- 26
- 27
- 28 • Preparing Homes for Wildfire: <https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Preparing-homes-for-wildfire>
- 29
- 30 • If your Home Doesn't Ignite, It Can't Burn: <https://www.youtube.com/watch?v=RqKFDDBGd5o>
- 31 • How do Homes Burn in a Wildfire? <https://www.youtube.com/watch?v=3QthynXyml>
- 32 • Wildfire Community Preparedness Day Toolkit: <https://go.nfpa.org/l/14662/2022-01-11/8j6nqh>

- 1 • 5 Key Areas Around the Home You Must Examine When Assessing Wildfire Risk:
2 <https://www.youtube.com/watch?v=MIUQVL3BvVg>
- 3 • Your Home and Wildfire, Choices That Make a Difference:
4 <https://www.youtube.com/watch?v=pfbEcMeYFFA>
- 5 • Home Hardening Fact Sheets: [https://www.nfpa.org/Public-Education/Fire-causes-and-](https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA/Firewise-USA-Resources/Research-Fact-Sheet-Series)
6 [risks/Wildfire/Firewise-USA/Firewise-USA-Resources/Research-Fact-Sheet-Series](https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA/Firewise-USA-Resources/Research-Fact-Sheet-Series)

7 Preparation and Evacuation

- 8 • Wildfire Preparedness Tips: [https://www.nfpa.org/Public-Education/Fire-causes-and-](https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Wildfire-safety-tips)
9 [risks/Wildfire/Wildfire-safety-tips](https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Wildfire-safety-tips)
- 10 • Wildfire Preparedness for Household Pets: [https://www.nfpa.org/-/media/Files/Public-](https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionPetsChecklist.pdf)
11 [Education/Campaigns/TakeAction/TakeActionPetsChecklist.pdf](https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionPetsChecklist.pdf)
- 12 • Wildfire Preparedness for Horses and Livestock: [https://www.nfpa.org/-/media/Files/Public-](https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionHorseChecklist.ashx)
13 [Education/Campaigns/TakeAction/TakeActionHorseChecklist.ashx](https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionHorseChecklist.ashx)
- 14 • Backpack Emergency GO! Kit: [https://www.nfpa.org/-/media/Files/Public-](https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionBackPackGoKit.ashx)
15 [Education/Campaigns/TakeAction/TakeActionBackPackGoKit.ashx](https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionBackPackGoKit.ashx)
- 16 • Outthink a Wildfire; Wildfire Action Policies: <https://www.nfpa.org/wildfirepolicy>

17 MISC.

- 18 • Non-Renewals for California Homeowners: [https://strongerca.com/wp-](https://strongerca.com/wp-content/uploads/2021/06/Non-renewals-for-CA-Homeowners.pdf)
19 [content/uploads/2021/06/Non-renewals-for-CA-Homeowners.pdf](https://strongerca.com/wp-content/uploads/2021/06/Non-renewals-for-CA-Homeowners.pdf)
- 20 • Mass Tree Mortality, Fuels, and Fire: A Guide for Sierra Nevada Forest Landowners:
21 <https://anrcatalog.ucanr.edu/pdf/8683.pdf>
- 22 • Instructor Guide; The ability to identifying, analyzing, and using relevant situational information
23 about topographic features can help predict wildland fire behavior is the responsibility of everyone
24 on the fireline: <https://www.nwcg.gov/sites/default/files/training/docs/s-190-ig04.pdf>
- 25 • WiRē – Wildfire Research, an interdisciplinary collaboration on community adaptability to wildland
26 fire: <https://wildfireresearchcenter.org/>
- 27 • Wildfire Ready App:
 - 28 ○ App Store: [https://apps.apple.com/us/app/wildfire-ready-](https://apps.apple.com/us/app/wildfire-ready-virtual/id1540773278?msclkid=4eac0069a71411ecb26fa03c0b08eba2)
29 [virtual/id1540773278?msclkid=4eac0069a71411ecb26fa03c0b08eba2](https://apps.apple.com/us/app/wildfire-ready-virtual/id1540773278?msclkid=4eac0069a71411ecb26fa03c0b08eba2)
 - 30 ○ Google Play:
31 <https://play.google.com/store/apps/details?id=com.BaltiVirtual.Wildfire&gl=US&msclkid=4eab>
32 [c8f6a71411ecbfe27aa64cd6d835](https://play.google.com/store/apps/details?id=com.BaltiVirtual.Wildfire&gl=US&msclkid=4eabc8f6a71411ecbfe27aa64cd6d835)

33

1 *This page intentionally left blank.*

DRAFT

SWCA

APPENDIX H:

Project Outreach

This page intentionally left blank.

1 COMMUNITY OUTREACH

2 Table H.1 presents examples of the public outreach completed as part of the CWPP development. Online
 3 resources were used to provide information to the public and solicit feedback. A community event was
 4 held by the 40 Acres Fire Safe Council, SWCA, and the Whitebark Institute. Figure H.1 shows an online
 5 announcement of the community event and Figure H.2 shows the community event. In addition, the
 6 Whitebark institute conducted an online survey of wildfire concerns and priorities. The survey and results
 7 are shown in pages H.3 through H.7.

8 Feedback, comments, and suggestions received from community members during community events
 9 (e.g., meetings and walkthroughs), the community survey, and project recommendations review were
 10 synthesized and utilized to craft project recommendations for the 40 Acres CWPP. Therefore, the project
 11 recommendations (see Chapter 4 or Appendix J) are specifically tailored to address the concerns and
 12 priorities of the community.

13 **Table H.1. Public Outreach Resources**

Resource Description	Location	Figure Number(s)	Date
Community Event Announcement	Facebook	H.2	10/28/2022
Neighborhood Meeting	40 Acres	H.1	10/29/2022
Community Survey	40 Acres (distributed via email)	See pages H-3 to H-7	December 2022



14 **Figure H.1. Community event announcement**
 15



1
2
3

Figure H.2. 40 Acres neighborhood meeting.

DRAFT

1 COMMUNITY SURVEY RESULTS

2 40 Acres CWPP:

3 Survey Responses: 6

4 December 2022

5

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

9 *Addresses removed for privacy*

10 Question 2. How would you rate your house in terms of risk from wildfire? (*Consider the proximity of your*
11 *house to tracts of undeveloped land, vegetated land, emergency response and access*)

12

13 _____ Low

14 _____ Medium

15 _____ High

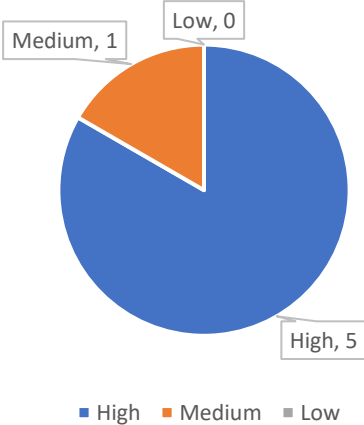
16

17

18



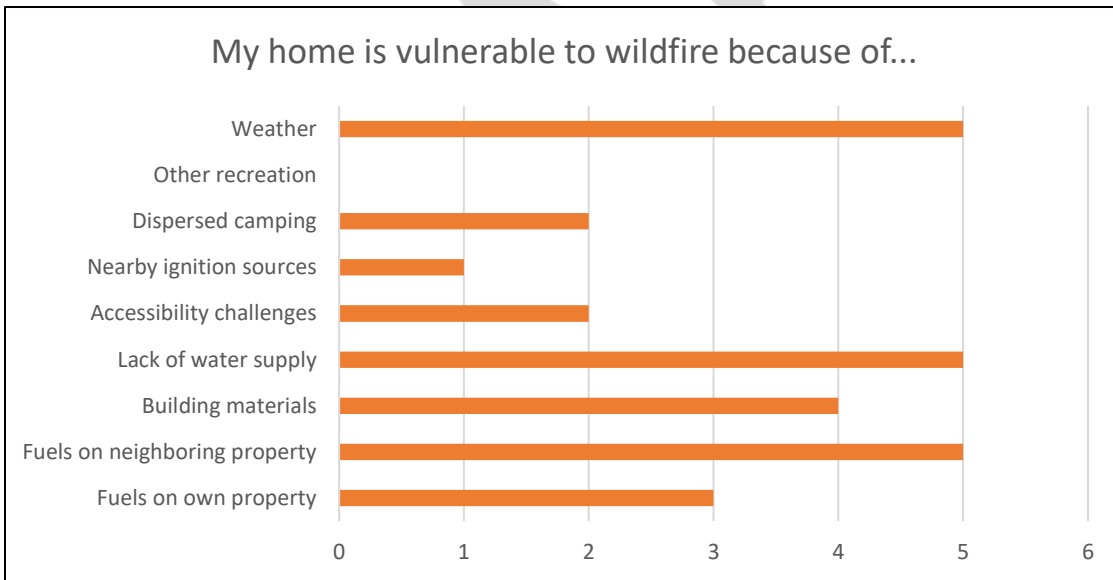
How would you rate your house in terms of risk from wildfire?



19

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

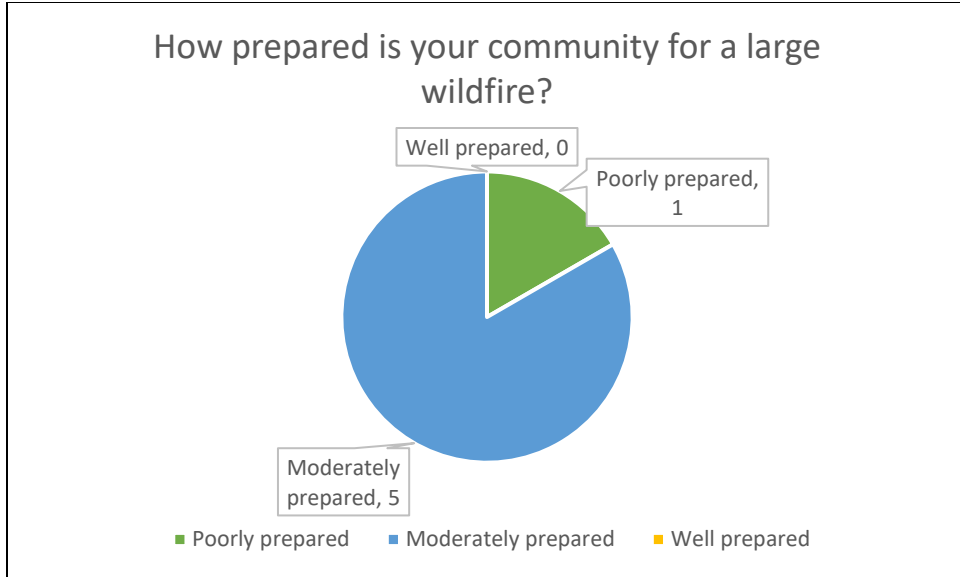
- 2 Surrounding fuels on your property - (i.e., live and dead trees, shrubs, grass, wood piles)
- 3 Surrounding fuels on neighboring property - (i.e., dense vegetation, wood piles, dead and
- 4 downed trees
- 5 Building materials - (i.e., wood shingles, clap board siding, wooden decks, wood fences)
- 6 Lack of water supply - (i.e., dependence on well water, far from hydrant)
- 7 Accessibility challenges - (i.e., long narrow driveway, dead end road, can a fire truck easily
- 8 access your property?)
- 9 Ignition sources from neighboring areas - (i.e., disposal of cigarette butts from trails or roads)
- 10 Dispersed camping
- 11 Other forms of recreation (i.e., hunting, off-roading, etc.)
- 12 Weather (wind, drought)
- 13 Other: _____



14

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

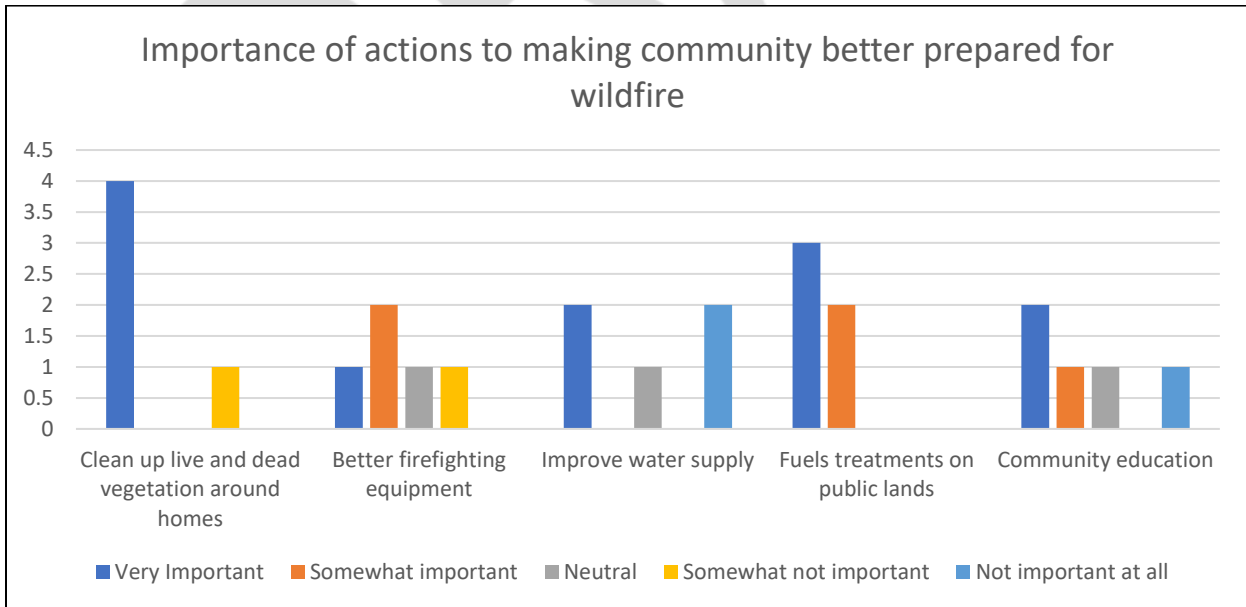
- 16 Poorly prepared
- 17 Moderately prepared
- 18 Well prepared



1
2
3
4
5
6
7
8
9
10
11
12

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



13

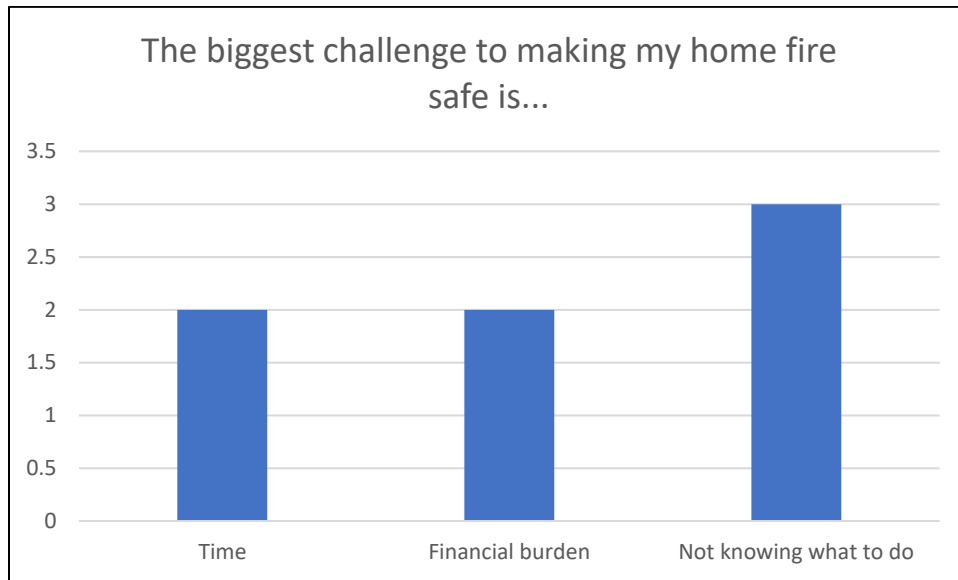
1 Question 6. My biggest challenge to making my home fire safe is.... (select all that apply)

2 _____ Time

3 _____ Financial burden of carrying out mitigation measures and maintaining clearance

4 _____ Not knowing what to do

5 _____ Other: _____



6

7 Question 7. I am most interested in our Fire Safe Council seeking funding to help with: (Please score 1-5,
8 1=not interested, 5=very interested)

9 _____ Green waste disposal - (i.e., removal of leaves, branches, wood from cleared areas)

10 _____ Home wildfire hazard assessments

11 _____ Wildfire prevention education

12 _____ Timber/fuel treatments on private land

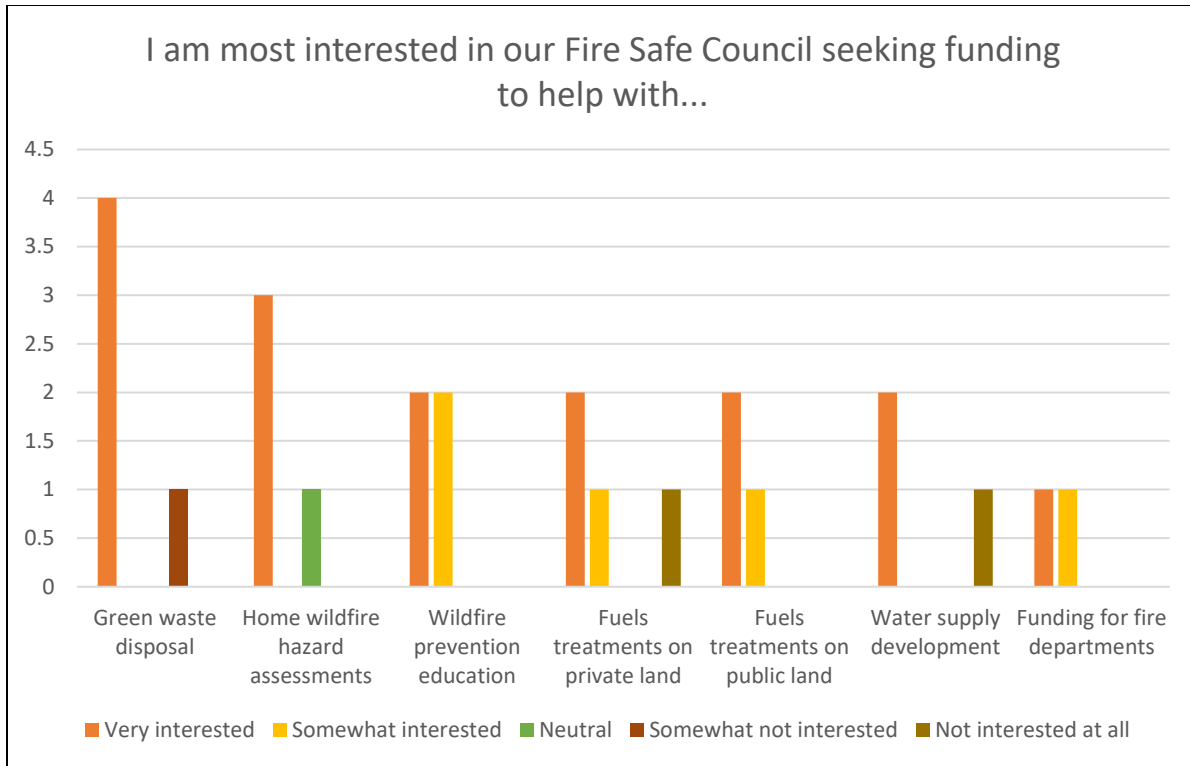
13 _____ Timber/fuel treatments on public land

14 _____ Water supply development - (i.e., extend public water systems, add additional hydrants,
15 install fire wells, and acquire portable water supplies)

16 _____ Funding for fire departments - (i.e., to secure additional apparatus/equipment, fund
17 training, fund additional staff)

18

19



1
2
3
4
5
6
7
8
9
10
11
12

Question 8. Do you burn on your property?

Yes _____

No _____

Two respondents answered “yes”, though one of those answers referred to a wood stove.

Four respondents 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.

1 STAKEHOLDER OUTREACH

- 2 To convene an all-inclusive Core Team, SWCA, the Whitebark Institute, and 40 Acres Fire Safe Council
3 conducted extensive stakeholder outreach that consisted of emails, calls, video conferencing, and in-
4 person meetings with personnel from the local government, private entities, fire organizations, and federal
5 land managers (see Figure H.2).



- 6
7 **Figure H.3. 40 Acres 2nd Core Team meeting (October 27, 2022).**

SWCA

APPENDIX I:
Project Recommendations

This page intentionally left blank.

1 **Table I.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	Spring 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.	Along ditches and creeks, focusing on the southwest ditch	40 Acres FSC, LADWP (to provide access and coordination), CDFW, BLM	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Limit the spread of wildland fire and increase access to water resources with strategic placement of fuel breaks Provide for safe and effective wildfire response capabilities 	<ul style="list-style-type: none"> Frequent maintenance since riparian vegetation grows quickly 	<ul style="list-style-type: none"> 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	Ongoing	H	According to project schedule	Follow through with the planned fuel breaks on the north, east, and south sides of the community Refer to Figure 4.1	Eastern, northern, and southern boundaries	LADWP (to provide access and coordination), CAL FIRE, 40 Acres FSC	<ul style="list-style-type: none"> Work with LADWP and CDFW to install fuel breaks on the north, east, and south sides of the community 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Regular maintenance is needed to ensure the fuel break remains clear of dense and flammable vegetation Monitor for invasive species 	<ul style="list-style-type: none"> CAL FIRE Grant Programs USFS CWDG
CRL #3		H	Fall 2024	Work with CDFW and BLM to install fuel breaks along the ditch to the southwest Refer to Figure 4.1	Southwest ditch	40 Acres FSC, CAL FIRE, BLM	<ul style="list-style-type: none"> Search for natural breaks in vegetation to create fuel breaks up to a quarter mile upstream from 40 Acres Align treatment with CDFW land management and habitat objectives 	<ul style="list-style-type: none"> Balance the reduction of hazardous fuels with the protection of wildlife habitat Protect life and property by mitigating fuels 	<ul style="list-style-type: none"> Regular maintenance is needed to ensure the fuel break remains clear of vegetation. Monitor for invasive species 	<ul style="list-style-type: none"> FEMA Building Resilient Infrastructure and Communities Grant (BRIC) USFS CWDG Grants CAL FIRE Grant Programs
CRL #4		H	Fall 2024	Increase workforce and firefighting personnel capacity	40 Acres and surrounding area	CAL FIRE	<ul style="list-style-type: none"> Develop workforce to implement and maintain needed hazardous fuels projects and to perform defensible space inspections Seek recruitment opportunities with non-profits such as the California Conservation Corps 	<ul style="list-style-type: none"> Reduce wildfire risk through greater capacity for wildfire projects Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI. 	<ul style="list-style-type: none"> Assess capacity on an annual basis 	<ul style="list-style-type: none"> FEMA Staffing for Adequate Fire and Emergency Response FEMA Assistance to Firefighters Grants California Fire Foundation Grant Program USFS CWDG
CRL #5		H	Spring 2024	Support fuel reduction efforts on private property by addressing green waste management	40 Acres	Inyo County, 40 Acres FSC, CAL FIRE, BLM	<ul style="list-style-type: none"> County to investigate how to acquire, rent, or borrow a chipper from BLM or CAL FIRE 40 Acres FSC to coordinate/ establish chipper days for the communities Consider liability concerns if trained personnel are not on-site to operate equipment 	<ul style="list-style-type: none"> Support community defensible space efforts Reduce fuel loading within the community 	<ul style="list-style-type: none"> Springtime, yearly 	<ul style="list-style-type: none"> CAL FIRE Forest Health Grants Firewise Communities Grants California Fire Safe Council Grants USFS CWDG
CLR #6	Ongoing	H	According to project schedule	Maintain the fuel break on the west side of 40 Acres Refer to Figure 4.1	40 Acres	BLM, CAL FIRE, 40 Acres FSC	<ul style="list-style-type: none"> Continue to apply the current approach 	<ul style="list-style-type: none"> Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI 	<ul style="list-style-type: none"> As scheduled 	<ul style="list-style-type: none"> CAL FIRE Grant Programs USFS CWDG Grants FEMA Building Resilient Infrastructure and Communities Grant (BRIC)

1 Table I.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	40 Acres	40 Acres FSC, CAL FIRE, and Inyo County OES	<ul style="list-style-type: none"> Create wildfire information and education documents to distribute 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) 40 Acres FSC to engage new homeowners/renters to promote fire education for property residents, even if temporary 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. Seek opportunities to work with the Whitebark Institute for defensible space and home hardening workshops and/or community demonstrations 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Review and revise strategy on an annual basis 	<ul style="list-style-type: none"> FEMA Building Resilient Infrastructure and Communities (BRIC) Grants EPA Environmental Education Grants CAL FIRE Grant Programs California Fire Safe Council Grants USFS CWDG
FAC #2		H	Fall 2023	Seek Firewise Community Certification for 40 Acres	40 Acres	40 Acres FSC	<ul style="list-style-type: none"> Work with Firewise USA, the California FSC, and the Inyo County Wildfire Coordinator to begin the process of Firewise certification if community supports involvement Evaluate community interests in Firewise Certification Conduct a cost-benefit analysis of forming a Firewise certified community Engage local, county, and state stakeholders 	<ul style="list-style-type: none"> Reduce wildfire risk through community collaboration Facilitate access to funding and assistance Develop a framework for action 	<ul style="list-style-type: none"> Maintain "good standing" by reporting work completed and accomplishments on an annual basis 	<ul style="list-style-type: none"> Firewise Grants California Fire Safe Council Grants USFS CWDG
FAC #3		H	Spring 2024	Implement community events focused on vulnerable populations	40 Acres	40 Acres FSC and Inyo County OES	<ul style="list-style-type: none"> Identify 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 	<ul style="list-style-type: none"> Reduce wildfire risk through greater adoption of Firewise and structure hardening measures 	<ul style="list-style-type: none"> Yearly, in preparation for the fire season Conduct annual review to determine what works and what doesn't 	<ul style="list-style-type: none"> FEMA BRIC Grants CAL FIRE Grants California Fire Safe Council 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 #4		H	Fall 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	40 Acres	Inyo County OES, 40 Acres FSC	<ul style="list-style-type: none"> 40 Acres FSC to work with the County to identify funding opportunities 40 Acres 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 	<ul style="list-style-type: none"> Assist vulnerable populations with wildfire risk reduction Support community defensible space efforts Reduce fuel loading within the community 	<ul style="list-style-type: none"> Establish a program to determine frequency of activities 	<ul style="list-style-type: none"> Firewise Grants CAL FIRE Wildfire Prevention Grants California Fire Safe Council Grants USFS CWDG
FAC #5		H	Summer 2023	Involve second-home owners and absentee homeowners in wildfire education and mitigation efforts	40 Acres	Inyo County OES, 40 Acres FSC	<ul style="list-style-type: none"> Inyo County Wildfire Coordinator to use the county assessor's mailing list to pull contact information for second homes and absentee homeowners 	<ul style="list-style-type: none"> Encourage community-wide involvement in wildfire prevention and mitigation efforts 	<ul style="list-style-type: none"> Biannual 	Not applicable
FAC #6		H	Spring 2023	Implement and maintain defensible space and structure hardening measures	40 Acres	Community residents and homeowners	<ul style="list-style-type: none"> Implement defensible space standards in the community Upgrade combustible construction materials to fire-resistive materials Seek opportunities to partner with Team Rubicon (https://teamrubiconusa.org/) for free wildfire mitigation support 	<ul style="list-style-type: none"> Reduce wildfire risk through greater adoption of Firewise and structure hardening measures 	<ul style="list-style-type: none"> Yearly maintenance 	<ul style="list-style-type: none"> CAL FIRE Wildfire Prevention Grants Firewise grants California Fire Safe Council Grants USFS CWDG
FAC #7		M	Spring 2024	Establish relationships with non-profit and public agencies to increase capacity	40 Acres	40 Acres FSC and Inyo County OES	<ul style="list-style-type: none"> Investigate opportunities to form relationships with non-profit agencies such as California Conservation Corps, American Conservation Experience, and Team Rubicon (https://teamrubiconusa.org/) 	<ul style="list-style-type: none"> Create resilient landscapes and address potential for extreme wildfire behavior in and around the community 	N/A	Not applicable
FAC #8		M	Spring 2024	Conduct a community walkthrough	40 Acres	40 Acres FSC, CAL FIRE, BLM	<ul style="list-style-type: none"> CAL FIRE and BLM staff to host a community walkthrough day with community residents to determine potential projects and needs for defensible space, fuel breaks, and fire response 	<ul style="list-style-type: none"> Increase wildfire preparedness and community safety Engage and involve community members 	<ul style="list-style-type: none"> Conduct on an annual basis 	Not applicable
FAC #9		M	Spring 2025	Address excess rubbish and debris on private properties	40 Acres	Inyo County OES, Inyo County Board of Supervisors	<ul style="list-style-type: none"> Investigate the feasibility of establishing a county ordinance to mandate the clearing of hazardous rubbish and debris 	<ul style="list-style-type: none"> Decrease hazardous combustible materials from the community Enhance community safety 	N/A	Not applicable
FAC #10		H	Summer 2024	Establish a community pre-fire plan	40 Acres	40 Acres FSC, 40 Acres homeowners, CAL FIRE, Inyo County OES	<ul style="list-style-type: none"> 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 elderly residents that may need assistance with evacuation 	<ul style="list-style-type: none"> Promote community involvement Improve community preparedness 	<ul style="list-style-type: none"> Yearly updates 	<ul style="list-style-type: none"> CAL FIRE Wildfire Prevention Grants California Fire Safe Council Grants Firewise Grants USFS CWDG

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

Project ID	Status	Priority (H,M,L)	Timeline for Action	Project Description	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To:	Monitoring/Maintenance Requirements	Funding Sources
SEWR #1		H	Fall 2024	Identify roads and shelter-in-place locations and inform residents about evacuation procedures	40 Acres	40 Acres FSC, Inyo County OES	<ul style="list-style-type: none"> Identify shelter-in-place locations and distribute maps to all residents Distribute information regarding County designated community shelters Distribute evacuation materials using resources from CAL FIRE, Firewise, and Ready, Set, GO! Increase education through community workshops and mock evacuation drills Develop a map that clearly shows all roads with potential ingress and egress points into 40 Acres and distribute to all residents 	<ul style="list-style-type: none"> Improve wildfire response and readiness Facilitate evacuation procedures 	<ul style="list-style-type: none"> Update as needed to reflect changes in evacuation routes and shelter-in-place locations 	<ul style="list-style-type: none"> EPA Environmental Education Grants FEMA Fire Prevention and Safety Grants Firewise Communities Grants CAL FIRE Fire Prevention Grants USFS CWDG
SEWR #2		M	Spring 2025	Expand coverage of Alert California live cameras	40 Acres	Alert California Core University Partners	<ul style="list-style-type: none"> Investigate opportunities to install cameras where there is limited coverage 	<ul style="list-style-type: none"> Enhance wildfire response and readiness Support early attack plans Facilitate emergency notifications such as evacuation orders 	<ul style="list-style-type: none"> Follow existing maintenance schedule 	<ul style="list-style-type: none"> FEMA Building Resilient Infrastructure and Communities Grants CAL FIRE Fire Prevention Grants USFS CWDG
SEWR #3		H	Fall 2024	Improve wildfire emergency notification systems	40 Acres	Sheriff's Office and Inyo County OES	<ul style="list-style-type: none"> Investigate the feasibility of installing a siren system in the community Establish a reliable source (website or notification system) to relay alerts and messages quickly and consistently Inyo County to continue the process of upgrading the Inyo OES website 	<ul style="list-style-type: none"> Provide timely emergency alerts Facilitate evacuation efforts 	<ul style="list-style-type: none"> Periodic testing of siren system 	<ul style="list-style-type: none"> FEMA BRIC Grants CAL FIRE Community Wildfire Prevention Grants USFS CWDG
SEWR #4		H	Winter 2023	Create additional means of ingress and egress	40 Acres	40 Acres FSC, BLM	<ul style="list-style-type: none"> Connect Ocean View Road to the BLM road to the west Work with CAL FIRE to determine road width specifications and requirements 	<ul style="list-style-type: none"> Provide alternative evacuation routes Provide additional access points for fire responders 	<ul style="list-style-type: none"> As needed to prevent encroachment of vegetation 	<ul style="list-style-type: none"> FEMA Fire Prevention and Safety Grants FEMA BRIC Grants CAL FIRE Community Wildfire Prevention Grants USFS CWDG
SEWR #5		M	Summer 2023	Provide sufficient clearance between power lines and trees	40 Acres	40 Acres FSC, Southern California Edison (SCE), LADWP	<ul style="list-style-type: none"> Utilize SCE's tree removal/maintenance program to maintain safe clearance between power lines/poles and trees <ul style="list-style-type: none"> Report hazard trees (trees that are in contact with powerlines or poles) at (800) 655-4555 Use LADWP's hotline to report hazard trees that are leaning and/or touching powerlines and poles (760) 873-0251 <ul style="list-style-type: none"> LADWP patrols will evaluate reports and determine if treatment is needed 	<ul style="list-style-type: none"> Reduce hazard tree encroachment Enhance firefighter safety 	<ul style="list-style-type: none"> As needed 	<ul style="list-style-type: none"> Not applicable
SEWR #6		M	Spring 2024	Maintain dirt roads and trails	40 Acres	CAL FIRE, BLM, Inyo County OES	<ul style="list-style-type: none"> Maintain existing road and trail networks using mechanical treatments 	<ul style="list-style-type: none"> Provide access to fire personnel Establish fuel breaks and fire containment lines 	<ul style="list-style-type: none"> Annually 	<ul style="list-style-type: none"> USFS Community Wildfire Defense Grant CAL FIRE Community Wildfire Prevention Grants FEMA BRIC Grants
SEWR #7		M	Spring 2025	Assess existing water supply for fire suppression and develop a map of backup power sources		CAL FIRE, Inyo County OES	<ul style="list-style-type: none"> Conduct an assessment of water resources in 40 Acres to determine if improvements are needed Identify backup power sources (e.g., solar power and generators) in the community and create a map to distribute to fire agencies and 40 Acres residents 	<ul style="list-style-type: none"> Protect life and property through improved firefighting response Improve firefighter safety 	<ul style="list-style-type: none"> As needed 	<ul style="list-style-type: none"> FEMA BRIC Grants USFS CWDG

AWCA

APPENDIX J:

Fuel Treatment Types & Methods

This page intentionally left blank.

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 in [Public Resources Code 4291](#) that expanded defensible space clearance requirements from 30 to 100 feet around buildings and structures within SRAs or very high fire hazard severity zones within LRAs. The Public Resources Code was amended in January 2021 to require an ember-resistant zone within 5 feet of the home/structure on or before January 1, 2023. This translates to having a clearance of 5 feet between the home/structure and any materials that would likely be ignited by embers (CAL FIRE 2022d).

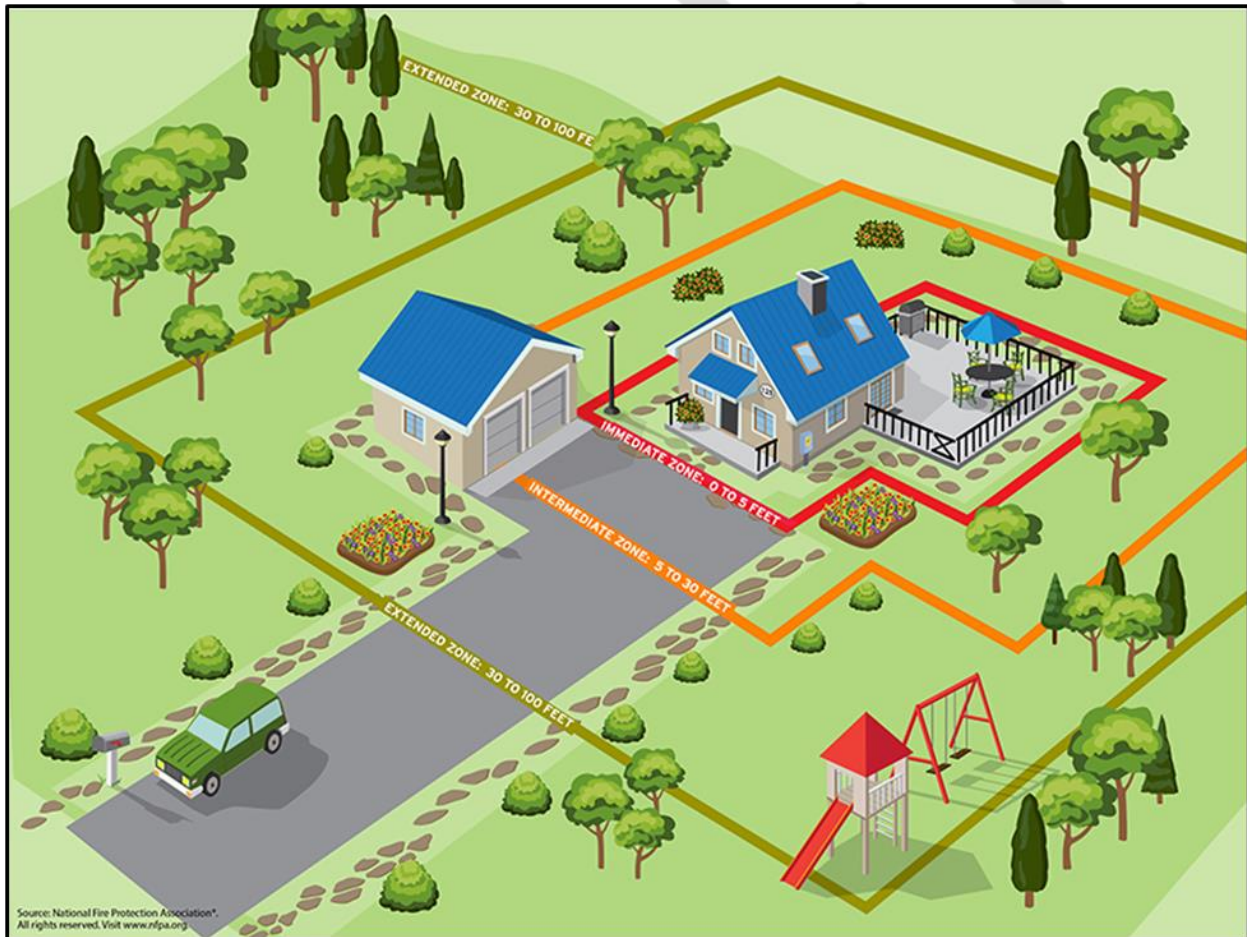


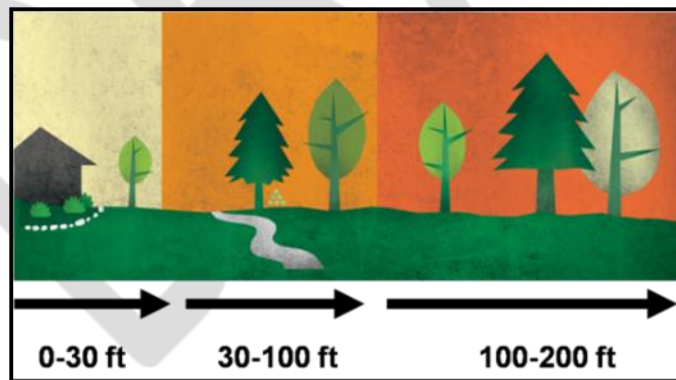
Figure J.1. Defensible space zones providing clearance between a structure and adjacent woodland or forest fuels.

Source: NFPA

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

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

19 Effective defensible space is an essentially fire-free zone adjacent to the home, a treated secondary zone
20 that is thinned and cleaned of surface fuels, and (if the parcel is large enough) a transitional third zone
21 that is basically a managed forest area (Figure J.2). These components work together in a proven and
22 predictable manner. Zone 1 keeps fire from burning directly to the home; Zone 2 reduces the adjacent fire
23 intensity and the likelihood of torching, crown fire, and ember production; and Zone 3 does the same at a
24 broader scale, keeping the fire intensity lower by maintaining a more natural, historic condition (Figure
25 J.2).



26
27 **Figure J.2. Defensible space zones.**

28 Source: Firewise.org

29 It should be emphasized that defensible space is just that—an area that allows firefighters to work
30 effectively and with some degree of safety to defend structures. While defensible space may increase a
31 home's chance of surviving a fire on its own, a structure's survival is not guaranteed, with or without
32 firefighter protection. Nevertheless, when these principles are consistently applied across a

1 neighborhood, everyone benefits. The three zones for defensible space actions are described below
2 (CAL FIRE 2022d):

3 **Zone 0 – Immediate Zone**, Ember Resistant: This zone is not currently required by state law. However,
4 as of January 1, 2023, Assembly Bill 3074 will require the Board of Forestry and Fire Protection to
5 develop the regulation for Zone 0. While not yet required, Zone 0 has been proven to be the most
6 important defensible space zone for protecting a home against wildfire. This zone consists of the
7 immediate area around a home and is defined as 0 to 5 feet from the property structure, including areas
8 under and around all structure attachments, such as sheds or decks. Zone 0 requires the most stringent
9 wildfire fuel reduction methods as actions taken within this zone can directly influence whether a property
10 ignites. Recommendations for treating Zone 0 include (CAL FIRE 2022d):

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

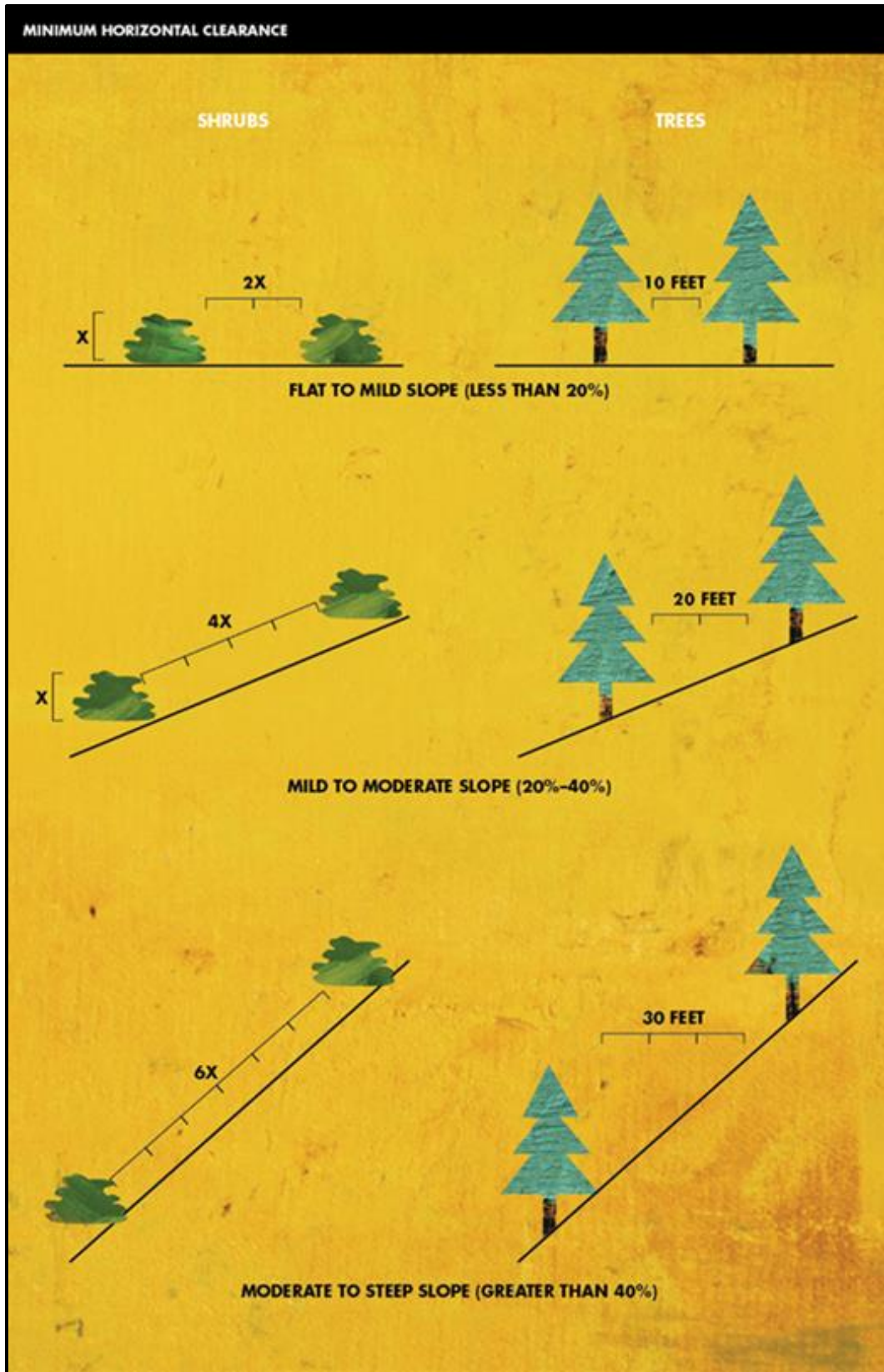
23 **Zone 1 – Intermediate Zone**, Clean and Green: Zone 1 consists of the first 30 feet from structures,
24 including home, decks, garages, etc. If a property line extends less than 30 feet, Zone 1 is the distance
25 from structures to the property line. This zone features fuel reduction efforts and serves as a transitional
26 area between Zones 0 and 2. Recommendations for treating Zone 1 include (CAL FIRE 2022d):

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

1 **Zone 2 – Extended Zone, Reduced Fuel:** This zone encompasses an area 30 feet from a structure out to
2 100 feet, or the property line, whichever is closer. This zone addresses fuel reduction to prevent wildfires
3 from spreading. Recommendations for treating Zone 2 include (CAL FIRE 2022d):

- 4 • Maintain all grasses to reach a maximum height of 4 inches.
- 5 • For shrubs or trees, maintain a distance between plants of at least two times a plant's size.
6 Additional space between vegetation is needed for properties on slopes (Figure J.3).
 - 7 ○ Flat to mild slope (less than 20%): Minimum distance of 10 feet between trees and two times
8 the size of other plants. Example: For shrubs 2 feet in diameter, at least 4 feet are needed
9 between shrubs.
 - 10 ○ Mild to moderate slope (20%–40%): Minimum distance of 20 feet between trees and four
11 times the size of other plants. Example: For shrubs 2 feet in diameter, at least 8 feet are
12 needed between shrubs.
 - 13 ○ Moderate to steep slope (greater than 40%): Minimum distance of 30 feet between trees and
14 six times the size of other plants. Example: For shrubs 2 feet in diameter, at least 12 feet are
15 needed between shrubs.
- 16 • Create vertical space between vegetation by clearing all branches at least 6 feet from the ground
17 for isolated trees, or for trees with nearby shrubs, clear at least 3 times the shrub height (Figure
18 J.4).
 - 19 ○ Example: A 4-foot shrub is growing near a tree; a clearance of 12 feet (3 x 4) is needed
20 between the top of the shrub and the lowest tree branch.
- 21 • Vegetation debris such as dead leaves, branches, twigs, pinecones, etc., may be allowed up to
22 3 inches in depth. However, it is best to remove vegetation debris.
- 23 • All wood or lumber piles must have a 10-foot buffer of bare mineral soil in all directions;
24 no vegetation is allowed.

25 In addition to the recommendations listed above, CAL FIRE suggests maintaining a clearance zone of
26 10 feet around any outbuildings or liquid propane gas storage tanks, and an additional 10-foot clearance
27 zone with no flammable vegetation (CAL FIRE 2022d).



1
2
3

Figure J.3. Minimum horizontal clearance.

Source: CAL FIRE 2022



1
2 **Figure J.4. Minimum vertical clearance.**
3 Source: CAL FIRE 2022

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

10 Assisting neighbors may be essential in many cases. Homeowners should consider assisting the elderly,
11 sharing ladders for gutter cleaning, and assisting neighbors with large thinning needs. Homeowner
12 actions have been found to also motivate neighbors to act, increasing the scope of wildfire mitigation
13 across a community (Evans et al. 2015). Adopting a phased approach can make the process more
14 manageable and encourage maintenance (Table J.1).

15 **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 the 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.

1 **FUEL BREAKS AND OPEN SPACE CLEANUP**

2 The next location priority for fuels treatments should be where the community meets wildland. This may
 3 be the outer margins of a town or an area adjacent to occluded open spaces such as a park. Fuel breaks
 4 (also known as shaded fuel breaks) are strips of land where fuel (for example, living trees and brush,
 5 dead branches, leaves or downed logs) has been modified or reduced to limit the fire’s ability to spread
 6 rapidly. Fuel breaks should not be confused with firebreaks, which are areas where vegetation and
 7 organic matter are removed down to mineral soil. Shaded fuel breaks may be created to provide options
 8 for suppression resources or to provide opportunities to introduce prescribed fire. In many cases, shaded
 9 fuel breaks may be created by thinning along roads. This provides access for mitigation resources and
 10 firefighters, as well as enhancing the safety of evacuation routes.

11 **LARGER SCALE TREATMENTS**

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

18 **ACTION ITEMS FOR HOMEOWNERS TO REDUCE**
 19 **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.

1

**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.

2

**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.

1

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

3 FUEL TREATMENT METHODS

4 Several fuels reduction methods are outlined in the following narrative.

5 Several treatment methods are commonly used for hazardous fuels reduction, including manual
6 treatments, mechanized treatments, prescribed fire, and grazing (Table J.2). This brief synopsis of
7 treatment options is provided for general knowledge; specific projects will require further planning.

8 The appropriate treatment method and cost will vary depending on factors such as the following:

- 9 • Diameter of materials
- 10 • Proximity to structures
- 11 • Acreage of project
- 12 • Fuel costs
- 13 • Steepness of slope
- 14 • Area accessibility
- 15 • Density and type of fuels
- 16 • Project objectives

17 It is imperative that long-term monitoring and maintenance of all treatments is implemented. Post-
18 treatment rehabilitation such as seeding with native plants and erosion control may be necessary.
19 In addition, post-treatment fuel clean-up is a must as neglected piles of vegetation may result in increased
20 fire risk.

1 **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.

2 **MANUAL TREATMENT**

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

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

1 MECHANIZED TREATMENTS

2 Mechanized treatments include mowing, mastication (ground-up timber), and whole tree felling. These
3 treatments allow for more precision than prescribed fire and are often more cost-effective than manual
4 treatment.

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

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

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

21 GRAZING

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

29 PRESCRIBED BURNING

30 Prescribed burning is also a useful tool to reduce the threat of extreme fire behavior by removing
31 excessive standing plant material, litter, and wood debris while limiting the encroachment of shrubby
32 vegetation. Where possible, prescribed fire could occur on public land since fire is ecologically beneficial
33 to this fire-adapted vegetation community and wildlife habitat.

34 All prescribed fire operations will be conducted in accordance with federal and state guidelines, laws, and
35 regulations. Public safety would be the primary consideration in the design of any prescribed burn plan so
36 as to not negatively impact the WUI. Agency use of prescribed fire on public land would be carried out
37 within the confines of the agency's fire management planning documents and would require individual
38 prescribed burn plans that are developed for specific burn units and consider smoke management

1 concerns and sensitive receptors within the WUI. Smoke monitors could be placed in areas where smoke
2 concerns have been raised in the past.

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

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

10 Cultural Burning

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

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

25 Impacts of Prescribed Fire on Communities

26 Prescribed fires can have impacts on air quality that may impact local communities. Impacts on a regional
27 scale are typically only acute when many acres are burned on the same day. Local problems are
28 occasionally acute due to the large quantities of smoke that can be produced in a given area during a
29 short period of time. Residents with respiratory problems may be impacted during these burning periods
30 since smoke consists of small particles of ash, partly consumed fuel, and liquid droplets that are
31 considered air pollutants. Other combustion products include invisible gases such as carbon monoxide,
32 carbon dioxide, hydrocarbons, and small quantities of nitrogen oxides. Oxides of nitrogen are usually
33 produced at temperatures only reached in piled or windrowed slash or in very intense wildfires that are
34 uncommon in the region. In general, prescribed fires produce inconsequential amounts of these gases.
35 Inappropriate management of prescribed fires can be bothersome to residents, and it can negatively
36 affect community health.

37 Smoke from burning vegetation produces air pollutants that are regulated by both the U.S. Environmental
38 Protection Agency (EPA) and the state of California (EPA 2019). Additionally, smoke can increase
39 ambient air pollution levels to a point where it exceeds air quality standards (California Air Resources
40 Board [CARB] 2023). Therefore, effective smoke management is a vital component of planning and
41 conducting prescribed fires (Figure J.5). The California Air Resources Board has smoke management
42 guidelines that protect the health and welfare of Californians from the impacts of smoke (CARB 2001).

1 In Inyo County, a permit from the local fire agency must be obtained to start a prescribed burn and can
2 only do so during “permissive burn days,” which are determined by the State Air Resources Board or the
3 local air district (Great Basin Unified Air Pollution Control District n.d.).

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

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



1

2 **Figure J.5. Photograph showing a prescribed pile burn in the Inyo National Forest.**

3 Source: <https://www.fs.usda.gov/detail/inyo/news-events/?cid=FSEPRD1074645>

4 Thinning and Prescribed Fire Combined

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

9 MANAGEMENT OF NON-NATIVE PLANTS

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

AWCA

APPENDIX K:

Post-fire Response and Restoration

This page intentionally left blank.

1 POST-FIRE RESPONSE AND REHABILITATION

2 The recent increase in severe fires has highlighted the numerous complexities of post-fire response.
3 Research indicates that high-severity burn areas may produce erosion and runoff rates 5 to 10 times
4 higher than the rates produced by moderate-severity burn areas (Sierra Nevada Conservancy 2021).
5 Following a fire, heavy rains may result in widespread floods carrying trees, boulders, and soil through
6 canyons, ultimately damaging communities and critical infrastructure. In the region, the areas that are
7 susceptible to debris flows and landslides include the base of the Sierra Nevada, particularly along
8 alluvial fans and canyons (Inyo County and City of Bishop 2017).

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

- 10 • Ensuring public health and safety—prompt removal of downed and hazard trees, addressing
11 watershed damage, and mitigating potential flooding.
- 12 • Rebuilding communities and assessing economic needs—securing the financial resources
13 necessary for communities to rebuild homes, business, and infrastructure.
- 14 • Restoring the damaged landscape—restoration of watersheds, soil stabilization, and tree
15 planting.
- 16 • Reducing fire risk in the future—identifying hazard areas and implementing mitigation.
- 17 • Prioritizing the needs of vulnerable and disadvantaged communities during response and disaster
18 recovery efforts.
- 19 • Reducing post-fire recovery time by replanting native species.
- 20 • Ensuring fire protection measures enhance sustainability of restoration projects e.g., introducing
21 prescribed fire to a fire-dependent ecosystem where fire had previously been excluded.
- 22 • Retaining downed logs for erosion control and habitat maintenance.
- 23 • Evaluating and updating disaster recovery plans every 5 years to respond to changing needs and
24 characteristics of the community.
- 25 • Coordinating with planning, housing, health and human services, and other local, regional or state
26 agencies to develop contingency plans for meeting short-term, temporary housing needs of those
27 displaced during a catastrophic wildfire event.
- 28 • Incorporating forecasted impacts from climate change into trends and projections of future risk
29 and consideration of policies to address identified risk.
- 30 • Updating codes and ordinances to specify procedures and standards for planning and permitting
31 the reconstruction of buildings destroyed by wildfire.

32 COMMUNITY RESPONSE AND RECOVERY

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

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

8 Emergency Assistance: Before, During, and After a Fire

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

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

18 After the Fire

19 Rebuilding and recovery from wildfire can vary greatly across income levels and demographics. Rural
20 areas, low-income neighborhoods, and immigrant communities generally do not have the necessary
21 resources to cover insurance and rebuilding expenses that occur after a fire. Due to this, many of these
22 areas take more time to recover than those with greater access to resources. In addition, the occurrence
23 of wildfire can worsen existing mental health conditions and lead to post-traumatic stress (PTS), low self-
24 esteem, and depression for at-risk populations (CA GOPR 2020).

25 Returning Home

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

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

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

1 for smoke or sparks in houses and other buildings. Once at home, check for the following (CAL FIRE
2 2019b):

- 3 • Check the roof and exterior areas for sparks or embers
- 4 • Check grounds for hot spots, smoldering stumps, and vegetation
- 5 • Check for fire damage to your home, turn off all appliances and make sure the meter is not
6 damaged before turning on the main circuit breaker
- 7 • Check the attic and throughout your house for any hidden burning sparks or embers
- 8 • Do not drink water from the faucet until emergency officials say it is okay, water supply systems
9 can be damaged and become polluted during wildfires
- 10 • Discard any food that has been exposed to heat, smoke, flood water, or soot
- 11 • If you have a propane tank or natural gas, leave valves closed until the supplier or utilities can
12 inspect your system
- 13 • If you have a solar electrical system, this system should be inspected by a licensed technician to
14 verify that the solar panels and electrical wiring are safe for continued operation
- 15 • Consult local experts on the best way to restore and plant your land with fire-safe landscaping
- 16 • Contact 911 if any danger is perceived
- 17 • Ash contains toxic substances and may be irritating to the eyes, nose, throat, and skin. Ash is
18 harmful to breathe and may trigger asthma attacks. Follow these tips to reduce your exposure to
19 ash (California Department of Public Health 2017):
- 20 • Do not allow children to play in the ash and wash off children's toys before children play with
21 them.
- 22 • Immediately wash any part of your body that touches ash to avoid irritation.
- 23 • Wash fruits and vegetables from your garden thoroughly before eating them.
- 24 • Keep pets out of ash areas.
- 25 • Frequently clean indoor surfaces by wet mopping.
- 26 • Wear protective clothing and a respirator when working outside.

27 Insurance Claims

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

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

- 37 • Review your insurance policy annually to see if your home is adequately insured

- 1 • Know your “loss of use” section – this covers living expenses should your home become unlivable
2 due to fire, smoke, or otherwise

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

5 Community Safety: Post-Fire Floods and Debris Flows

6 There are numerous natural hazards after a wildfire. Perhaps the most dangerous are potential flash
7 floods and landslides following rainfall in a burned area upstream of a community. Wildfires increase the
8 risk of flooding because burned soil is unable to absorb rainfall and it becomes hydrophobic. Factors that
9 contribute to flooding and debris flows are steep slopes, heavy rainfall, weak or loose rock and soil, and
10 improper construction and grading. Even small rainfall can cause a flash flood, transporting debris and
11 damaging homes and other structures. Listen and look for emergency updates, weather reports, and flash
12 flood warnings (California Department of Conservation 2019). Develop an evacuation plan with your
13 family and stay away from waterways, storm channels, and arroyos. Be aware of your risk, pay attention
14 to weather forecasts, listen to local authorities, and have a household inventory with copies of critical
15 documents (California Department of Water Resources 2021).

16 Mobilizing Your Community

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

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

27 Residents throughout California are encouraged to join forces to create local Fire Safe Councils (FSCs) to
28 minimize and prevent wildfire losses. FSCs are community-based organizations that mobilize residents to
29 protect their properties, communities, and environments from disastrous wildfires. FSCs educate
30 homeowners about community wildfire preparedness activities while collaborating with local fire officials to
31 plan and implement projects that increase the wildfire resilience of their communities (California Fire Safe
32 Council 2021).

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

40 Communities are also encouraged to establish a post-fire coordinator. The post-fire coordinator is
41 appointed by the community to assist in a coordinated response to a wildfire and to aid the community's
42 post-fire recovery efforts. The post-fire coordinator is likely to collaborate with local, state, and federal

1 organizations that participate in emergency response and post-fire recovery efforts. It is important that the
2 post-fire coordinator have demonstrated management, internet, and social media skills, community
3 knowledge, and experience with government agencies and programs (California SJT 2019).

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

- 7 1. Housing
 - 8 a. FEMA
 - 9 b. Federal Housing Administration
 - 10 c. California Department of Housing and Community Development
 - 11 d. The Salvation Army
- 12 2. Debris Removal
 - 13 a. California Department of Resources Recycling and Recovery
 - 14 b. USACE
- 15 3. Debris Modeling
 - 16 a. USGS
- 17 4. Hazardous Waste and Pollution
 - 18 a. California Environmental Protection Agency
- 19 5. Pets and Livestock
 - 20 a. American Society for the Prevention of Cruelty to Animals
 - 21 b. CDFA
- 22 6. Food
 - 23 a. USDA Supplemental Nutrition Assistance Program
 - 24 b. California Department of Social Services, Disaster CalFresh
- 25 7. Social Services
 - 26 a. California Employment Development Department
 - 27 b. FEMA Disaster Unemployment Assistance
 - 28 c. U.S. Administration for Children and Families
 - 29 d. Office of Access and Functional Needs
 - 30 e. California Foundation for Independent Living Centers
- 31 8. Farm Rehabilitation
 - 32 a. Farm Service Agency
 - 33 b. USDA Rural Development Disaster Assistance
 - 34 c. Natural Resources Conservation Service (NRCS) General Environmental Quality Incentives
35 Program Financial Assistance

1 9. General

- 2 a. The American Red Cross
- 3 b. California Governor's Office of Emergency Services
- 4 c. USFS
- 5 d. NPS
- 6 e. CAL FIRE

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

10 Communication

11 After a team is assembled and immediate tasks are identified, find the best way to spread information in
12 your community. You may distribute flyers, set up a voicemail box, work to find pets or livestock that have
13 been displaced, develop a mailing list for property owners, hold regular public meetings, etc. It is
14 important that a long-term communications plan is developed (California SJT 2019). Applying the
15 following steps can aid in successful communication (California SJT 2019):

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

23 Post-Fire Rehabilitation and Resources

24 Wildfires that cause extensive damage necessitate dedicated efforts to avert issues afterwards.
25 As aforementioned, loss of vegetation increases soil susceptibility to erosion; water runoff may increase
26 and lead to flooding; sediments and debris may be transported downstream and damage properties or
27 saturate reservoirs putting endangered species and water reserves at risk (USFS 2021d). Following a
28 fire, the primary priority is emergency stabilization to prevent additional damage to life, property, or
29 natural resources. The soil stabilization work starts immediately and may proceed for up to a year.
30 The rehabilitation effort to restore damage caused by the fire starts after the fire is out and may persist for
31 various years. For the most part, rehabilitation efforts focus on the lands not likely to recover naturally
32 from wildfire damage (USFS 2021d).

33 The USFS and the Department of the Interior (DOI) post-fire emergency stabilization program is called
34 the Burned Area Emergency Response (BAER) program. The goal of the BAER program is to discover
35 post-wildfire threats to human life and safety, property, and critical natural or cultural resources on USFS,
36 DOI, and Tribal trust lands and take appropriate actions to mitigate unacceptable risks (NIFC 2022).
37 BAER teams are composed of trained professionals in different fields: soil scientists, engineers,
38 hydrologists, biologists, botanists, archaeologists, and others who quickly assess the burned area and
39 advise emergency stabilization treatments (NIFC 2022).

1 The NRCS Emergency Watershed Protection (EWP) program provides technical and financial services
2 for watershed repair on **public (state and local) and private land**. The goal is to reduce flood risk via
3 funding and expert advice for land treatments. The EWP program can provide up to 75% of funds;
4 remaining funds can be paid with in-kind volunteer labor (Coalition for the Upper South Platte [CUSP]
5 2016). This funding is used by the State Emergency Rehabilitation Team (a multi-agency group
6 assembled by the NRCS) to develop specific recovery and treatment plans.

7 Examples of potential treatments include (USFS 2021e):

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

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

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

20 Specific Treatment Details

21 Hillslope Treatments

22 *Cover Applications:*

23 **Dry mulch:** provides immediate ground cover with mulch to reduce erosion and downstream flow.

24 **Wet mulch (hydromulch):** provides immediate cover to hold moisture and seeds on slopes using a
25 combination of organic fibers, glue, suspension agents, and seeds (most effective on inaccessible
26 slopes).

27 **Slash spreading:** provides ground cover to reduce erosion by felling trees in burned areas.

28 **Seeding:** reduces soil erosion over time with an application of native seed mixtures (most successful in
29 combination with mulching). Breaking up and loosening topsoil to break down the hydrophobic layer on
30 top of the soil is also effective.

31 *Erosion Barrier Applications:*

32 **Erosion control mat:** organic mats staked on the soil surface to provide stability for vegetation
33 establishment.

34 **Log erosion barrier:** trees felled perpendicular to the hillslope to slow runoff.

- 1 **Fiber rolls (wattles):** rolls placed perpendicular to the hillslope to reduce surface flows and reduce
2 erosion.
- 3 **Silt fencing:** permeable fabric fencing installed parallel to the slope contour to trap sediment as water
4 flows down the hillslope.

5 Channel Treatments

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

13 Road and Trail Treatments

- 14 **Outsloping and rolling dips (water bars):** alter the road shape or template to disperse water and
15 reduce erosion.
- 16 **Overflow structures:** protect the road by controlling runoff and diverting stream flow to constructed
17 channels.
- 18 **Low water stream crossing:** culverts replaced by natural fords to prevent stream diversion and keep
19 water in the natural channel.
- 20 **Culvert modification:** upgrading culvert size to prevent road damage.
- 21 **Debris rack and deflectors:** structure placed in a stream channel to collect debris before reaching a
22 culvert.
- 23 **Riser pipes:** filter out debris and allow the passage of water in stream channels.
- 24 **Catchment-basin cleanout:** using machinery to clean debris and sediment out of stream channels and
25 catchment basins.
- 26 **Trail stabilization:** constructing water bars and spillways to provide drainage away from the trail surface.
- 27 These treatments and descriptions are further detailed at: [https://afterwildfirenm.org/post-fire-treatments/
28 treatment-descriptions](https://afterwildfirenm.org/post-fire-treatments/treatment-descriptions)
- 29 For more information about how to install and build treatments, see the Wildfire Restoration Handbook at:
30 [https://www.rmfi.org/sites/default/files/hero-content-files/Fire-Restoration-HandbookDraft_2015_
31 2.compressed_0.pdf](https://www.rmfi.org/sites/default/files/hero-content-files/Fire-Restoration-HandbookDraft_2015_2.compressed_0.pdf)

32 Timber Salvage

- 33 Many private and federal landowners may decide to harvest trees killed in the fire, a decision that can be
34 highly controversial. Trees remaining post-fire can be instrumental for soil and wildlife habitat recovery,

1 but dead standing trees may also pose safety concerns and fuel loadings may still be conducive to future
2 high intensity wildfires. Burned soil is especially susceptible to soil compaction and erosion so it is
3 recommended to have professionals perform the timber salvage. Several programs assist landowners
4 with timber salvage, including the NRCS Environmental Quality Incentives Program (EQIP) (CUSP 2016).

5 Invasive Species Management and Native Revegetation

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

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

17 Long-Term Community Recovery

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