Community Wildfire Protection Plan
Siskiyou County

Klamathon Fire | July 2018

Happy Complex | August 2014

Boles Fire | September 2014

May 21, 2019

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COMMUNITY WILDFIRE PROTECTION PLAN

SISKIYOU COUNTY

MUTUAL AGREEMENT PAGE

This countywide Community Wildfire Protection Plan (CWPP) for Siskiyou County:

- ✓ Was collaboratively developed. Participants included interested residents and citizens, local fire departments, city and county leadership positions, state and federal suppression agencies and other land management entities of Siskiyou County.

- ✓ Is designed to help communities identify and prioritize areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect the communities of Siskiyou County.

- ✓ Identifies current measures to reduce the ignitability of structures throughout the area addressed by the plan.

The following entities mutually agree with the contents of this Community Wildfire Protection Plan:

Recommended by: Perry L. Daniel
Perry Daniels, Vice President
on behalf of, Jaime Tarne, President
Fire Safe Council of Siskiyou Council

Recommended by: Bernie Paul
Bernie Paul, President
Siskiyou County Fire Chiefs Association

Recommended by: Brandon A. Criss
Brandon A. Criss, Chair
Siskiyou County Board of Supervisors

ATTEST:
LAURA BYNUM
County Clerk & Ex-Officio
Clerk of the Board

By: Wendy [illegible]
Deputy

Approved by: Phillip R. Anzo 5/21/2019
Phillip R. Anzo, Unit Chief
CAL FIRE Siskiyou

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ACKNOWLEDGEMENTS

This CWPP is a community-based resource guide to achieve resilience in plans, preparation and survival in Siskiyou County's wildfire environment. Strength in the collaboration process is a noteworthy step. People and organizations that contributed in development or helped in certification of the CWPP include:

<u>Siskiyou County Residents</u>
All community members who attended workshops and contributed their local knowledge to this process.

<u>Local Community Fire Safe Councils</u>
Fire Safe Council members from all communities who joined in the collaborative workshops providing their questions, insights and feedback

<u>Fire Safe Council of Siskiyou County</u>
FSCSC board members who initiated the plan update effort by pursuing funding and dedicated their time to contribute to this plan.

<u>County of Siskiyou Leadership</u>
- County Board of Supervisors
- County Office of Emergency Services
- County Department of Natural Resources
- County Code Enforcement

<u>Siskiyou County Fire Chief's Association</u>
All Fire Chiefs and local fire personnel/volunteers who attended and supported community workshops and provided content for this plan.

<u>CAL FIRE</u>
All Siskiyou Unit CAL FIRE personnel who were active and helpful participants at all stages of plan development. Representation included:
- Unit Chief and Assistant Chiefs
- Unit Battalion Chiefs
- Unit Prevention Officers
- Unit Vegetation Management Forester

Technical and data support from State level; Fire and Resource Assessment Program (FRAP)
- Research Program Specialist

<u>California Office of Emergency Services</u>
- Asst. Chief, Region III, Fire & Rescue Division

<u>Tribal Representation</u>
- Shasta Nation Tribe Representative

<u>Klamath National Forest</u>
All Forest personnel who participated in workshops and assisted in plan development stages; including personnel from:
- Forest Leadership staff
- Forest Fire Management personnel
- Forest Ecologist
- District Fire Management

<u>Shasta-Trinity National Forest</u>
All Forest personnel who participated in workshops and assisted in plan development stages; including personnel from:
- Forest Leadership staff
- Forest Fire Management personnel
- District Fire Management, Prevention and Fuels Officers

<u>Rogue-Siskiyou National Forest</u>
- Forest Fire Management Representation

<u>Community Meetings and Workshop Hosts</u>
- CAL FIRE Siskiyou Unit Headquarters, Yreka CA
- College of the Siskiyous – Fire Training Ctr Weed, CA.
- Seiad Valley Fire Department – Fire Hall, Klamath River, CA
- Klamath National Forest - Headquarters, Yreka, CA
- Klamath National Forest, Goosenest Ranger District Office, Macdoel, CA
- Resource and Events Center, Fort Jones, CA

<u>Pacific Power</u>
- Area Project Manager/Forester

<u>Northern California Resource Center</u>
- Leadership and Project Mgmt Representatives

<u>Consultant/Support</u>
- Fire Ecology & Climate Scientist
- Geo Elements LLC

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This CWPP is a product of collaboration among citizens across Siskiyou County and serves as a guide with tools to help protect local communities to plan and prepare for wildfire impacts. Current policy and information are imperative as California faces unprecedented loss of life, property and natural resources to wildfire. Fire Safe Council of Siskiyou County (FSCSC) has been central to project initiation and leadership, with funding support from CAL FIRE and United States Forest Service grants. Extensive cooperative work includes communication amongst local fire departments, fire safe councils, state and federal agencies, county leadership positions, resource groups and general public.

Requirements for a CWPP described by the Healthy Forest Restoration Act of 2001 are:

1. Develop collaboratively
2. Identify and prioritize areas for hazardous fuel reduction treatments
3. Recommend treatments to reduce structure ignitability

PART I: General Elements

- Contains core Sections (1-9) of the CWPP that address general elements on a countywide scale providing a template or guidance for use in local level CWPPs. An overview of the element organization within sections is as follows:

  1. Sections 1-5: CWPP Elements general in scope including: *(address 'what, where, when, who')*
     - Introduction, Purpose, Objectives, Collaborative process, Policy
     - Siskiyou County background
     - Communities At Risk
     - Wildfire situation; ecology, climate, fire history, wildfire environment
     - Wildfire science/assessment
  2. Sections 6-8: Mitigation actions, implementation tools and funding sources including: *(address 'how')*
     - Action planning - Preparedness, Strategy, Mitigations
     - Potential funding resources
     - Monitoring programs
  3. Section 9: The development team's primary recommendations

PART II: Planning Regions (1-6)

- Conveys wildfire assessment information (from Section 5) into six succinct geographical divisions of the County as delineated in the original (2008) CWPP. The divisions provide tools at a scale to better support local CWPP development.

1. Butte Valley	3. Salmon	5. Shasta Valley
2. Mid-Klamath	4. Scott Valley	6. Upper Sacramento

PART III: Appendices

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PART I. GENERAL ELEMENTS

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This Community Wildfire Protection Plan (CWPP) conveys a countywide wildfire assessment to achieve a common goal: expand community wildfire resilience for life safety and value protection. Fire Safe Council of Siskiyou County initiated this plan update project which provides extensive new data and information currency. As a science-based platform, this CWPP provides foundational guidance for communities' wildfire planning, effective mitigation strategy and implementation actions. Cooperative work by all citizens to accomplish adaptive measures that minimize potential wildfire hazard will progressively increase survivability factors in Wildland Urban Interface (WUI) settings.

The years 2017-2018 marked California's most destructive and deadliest wildfire season on record. In Siskiyou County, an unusually early July 5th (2018) ignition sparked the Klamathon fire, devastating the town of Hornbrook and sending an unsettling course of concern throughout suppression agencies. A significant increase in wildfire incident size and complexity over the last several years has been accompanied by catastrophic losses including life, community structures, infrastructure, valuable timber resources and watersheds. Factoring recent fire severity data, climate trends and ecosystem changes, the question is not **if** a wildfire will burn, but **when** it will burn.

Klamathon Fire, Hornbrook
Courtesy of Patrick Titus, Cal OES

This plan fulfills an important role to better position all of Siskiyou County's communities striving for federal and state level grants as well as other funding sources.

1.1 PURPOSE OF THE PLAN

The primary purpose of this CWPP is to provide guidance that enhances protection of human life and to help Siskiyou County communities become more adaptable to wildfire, while reducing the wildfire threat to community values such as structures, critical infrastructure, businesses, and natural and historic resources. This CWPP is designed to guide future actions by residents, property owners, business owners, homeowners associations, fire safe councils, agencies and citizens. It will provide an understanding of how to plan and implement specific actions to reduce wildfire threat, live more safely in a wildfire prone environment, and build more resilient communities.

This CWPP will serve as a community resource for wildfire protection activities and focus on the ability to adapt to safer living in wildland surroundings. Effective project implementation is subject to available funding/capacity and the ability to target identified high-hazard areas and fulfill environmental review processes (i.e., California Environmental Quality Act).

Additionally, this plan serves to support existing local CWPP's and/or provide a tool for communities that do not have the resources to develop a local CWPP. This countywide CWPP offers a framework to assist Siskiyou County's communities in their ability to compete for hazard reduction funding opportunities, including for the 30 Communities at Risk in the County as identified in the State Fire Marshal's plan (see *Section 4.* for a discussion of Communities at Risk).

TERMINOLOGY TIP

Hazard: A physical situation (fuels, weather, or topography) with potential for causing harm or damage as a result of wildland fire (Scott and Reinhardt, 2001).

Risk: The chance of wildfire starting as determined by the presence and activity of a causative agent, i.e., lightning, equipment use, smoking, campfires, debris burning, railroads, power lines, incendiary or arson (Morris, 2000).

Threat: A person or thing likely to cause damage or danger (Oxford English Dictionary).

1.2 GOALS AND OBJECTIVES

Table 1 summarizes the key goals and objectives of this CWPP which were collaboratively defined and updated during interagency meetings and public workshops during the initial period of the planning process.

Table 1 - CWPP Goals and Objectives

GOALS	OBJECTIVES
Reduce the wildfire threat to life and property	• Provide guidance to identify specific areas with the greatest wildfire threat • Evaluation of wildfire protection capabilities and safe evacuation needs • Deliver guidelines and mitigation strategies to reduce threats to life and property
Impart proactive wildland fire safety measures to improve protection of communities and reduce excessive, hazardous fuel conditions	• Identify strategies that reduce structure vulnerability through assessment of potential damage/loss from burning embers and a flaming fire front • Provide recommendations regarding ingress and egress routes throughout the County for incorporation into existing and future fuel treatment activities

	• Characterize hazard mitigation strategies and hazardous fuel reduction activities that enhance protection of values
Provide public wildfire awareness and education as a necessary step for survival in the Wildland Urban Interface	• Update existing policy, regulations and guidelines that address wildfire hazard/threat • Identify opportunities for property-owners to receive on-site education as it pertains to pre-fire prevention planning and living in the WUI
Promote healthy forest landscapes, providing for improved water and air quality	• Convey mitigation strategies that consider visual, resource and environmental quality • Address best management practices regarding natural and historic resources • Ensure the CWPP meets or exceeds the requirements of the Healthy Forests Restoration Act of 2003; address the importance of concerted actions regarding the increasingly problematic tree mortality issue
Facilitate knowledge of national, state and county level fire planning and sources to finance activities	• Provide information resources to enable citizens access to the latest plans and policies at all levels • Identify grant funding sources for wildfire mitigation and education projects

1.3 PLANNING PROCESS

The development of a CWPP is a collaborative process by which community participants assess the wildfire threat, define their WUI boundaries, identify their communities' values at risk from wildfire, and then develop solutions to mitigate the wildfire threat. A key foundational document - the Healthy Forests Restoration Act of 2003 (HFRA) – uses language carefully tailored to provide maximum flexibility for communities to determine the substance and detail of their individual community plans and the procedures they use to develop them. This CWPP establishes a larger (county-wide) scale framework which can help individual community planning efforts with important information such as currency in fire-related policy and area wildfire assessments across the County. The CWPP planning process provides communities the autonomy to develop their own individual plans that influence where and how federal and state agencies implement fuel treatment activities on federal or state jurisdiction lands. This plan is also an effective tool in the potential distribution of federal and/or state funds for a variety of wildfire protection projects.

The CWPP planning process brings together broad and diverse local interests to identify and discuss mutual concerns related to public safety and community and natural resources sustainability. The process provides a positive, solution-oriented environment in which to address the challenges of living in a community at risk from wildfire. Because not all community members will attend workshops or meetings, it is important to provide multiple opportunities in which to solicit input, collect issues and concerns, and provide information related to the development of a CWPP.

The HFRA specifies three minimum requirements for a CWPP, including:

1. *Collaboration.* A CWPP must be collaboratively developed. Local officials and state officials must meaningfully involve federal agencies that manage land in the vicinity of the community and other interested parties, particularly non-governmental participants.
2. *Prioritized Fuel Reduction.* A CWPP must identify and prioritize areas for hazardous fuel reduction treatments on both federal and non-federal land and recommend the types and methods of treatment that, if completed, would reduce the risk to the community.
3. *Treatment 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.

The HFRA also requires that three entities must mutually agree on the final contents of a CWPP:

1. The applicable local government entities (i.e., counties or cities)
2. The local fire department(s)
3. The state entity responsible for forest management

In Siskiyou County, final approval of Community Wildfire Protection Plans is a duty of the Unit Chief of CAL FIRE Siskiyou.

1.3.1 Siskiyou County's Collaborative Approach

A priority in the development of this CWPP was to engage community participation, utilizing an iterative and inclusive approach designed to educate participants on the CWPP planning process, encourage participation, and solicit a broad range of inputs.

The initial collaborative effort began on May 18, 2017 with a cooperative interagency meeting/workshop at CAL FIRE Siskiyou Unit's Headquarter Office. Representation at this meeting included: United States Forest Service (USFS), Shasta Trinity National Forest, and Rogue-Siskiyou National Forest; Tribal Representation; Shasta Nation; CAL FIRE Unit Chief; Siskiyou County Resource Officer; the McCloud local fire department; and Fire Safe Council of Siskiyou County. FSCSC Chairperson provided opening remarks and introduced the CWPP development contract team Proactive Wildland Resources, who proceeded with a brief presentation of the CWPP planning process, the fire science elements, and examples of potential goals and objectives for the CWPP. Participants took part in identifying issues and concerns. Following the formal presentation, a question and answer period, an informal phase of the workshop provided participants with the opportunity to talk with other representatives present on specific topics of interest or concern. Index cards were offered and provided participants with an additional opportunity for comments and input.

1.3.2 Public Outreach Process

Five different public workshops were held in representative locations of the County to attempt to alleviate extensive travel for various community members. These workshops utilized a format similar to that described above in the initial cooperative interagency workshop, with additional time allocated for the workshop station portion of the meeting.

Public outreach for these five workshops occurred through direct emails, phone calls, radio announcements, postings of a press release in the *Mount Shasta Herald* and *Siskiyou Daily News*, and updates on the FSCSC Facebook page.

Information on collaborative public workshops, interagency meetings, and participant comments is available in Appendix D.

Pre-Work: Public Workshop Dates and Locations

- July 19, 2017 College of the Siskiyous, Weed CA
- July 24, 2017 Seiad Valley Fire Department Hall, Klamath River, CA
- August 15, 2017 Klamath National Forest Headquarters, Yreka, CA
- September 12, 2017 Klamath National Forest, Goosenest Office, Macdoel, CA
- September 28, 2017 Resource and Events Center, Fort Jones, CA

1.3.3 Public Review and Comment Period, Final Public Meeting

After incorporating agency and public inputs, a draft CWPP was created and the document was posted for a 30-day public review period. A final public meeting was held in Yreka for all interested parties to join and participate in presenting feedback, asking questions and voicing concerns.

Final Public Meeting Date and Location

- March 13, 2019 – CAL FIRE Siskiyou Headquarters Office, Yreka CA

1.3.4 Fire Safe Council Role

Fire Safe Councils (FSCs) are groups of concerned citizens who organize to provide education on fire safe programs, projects and planning (see http://www.firesafecouncil.org for more information). They work closely with local fire agencies and coordinate with community citizens to develop and implement wildfire protection priorities. Local FSCs are grassroots community-based organizations which share the objective of improving community resilience and reducing overall vulnerability to catastrophic wildfire. They accomplish this through education programs and fuel reduction projects - actions that can improve citizen's defensibility when faced with an advancing wildfire and provide for improved fire fighter safety. The first local FSC's started in the early 1990s, and there are now well over 100 around the state of California.

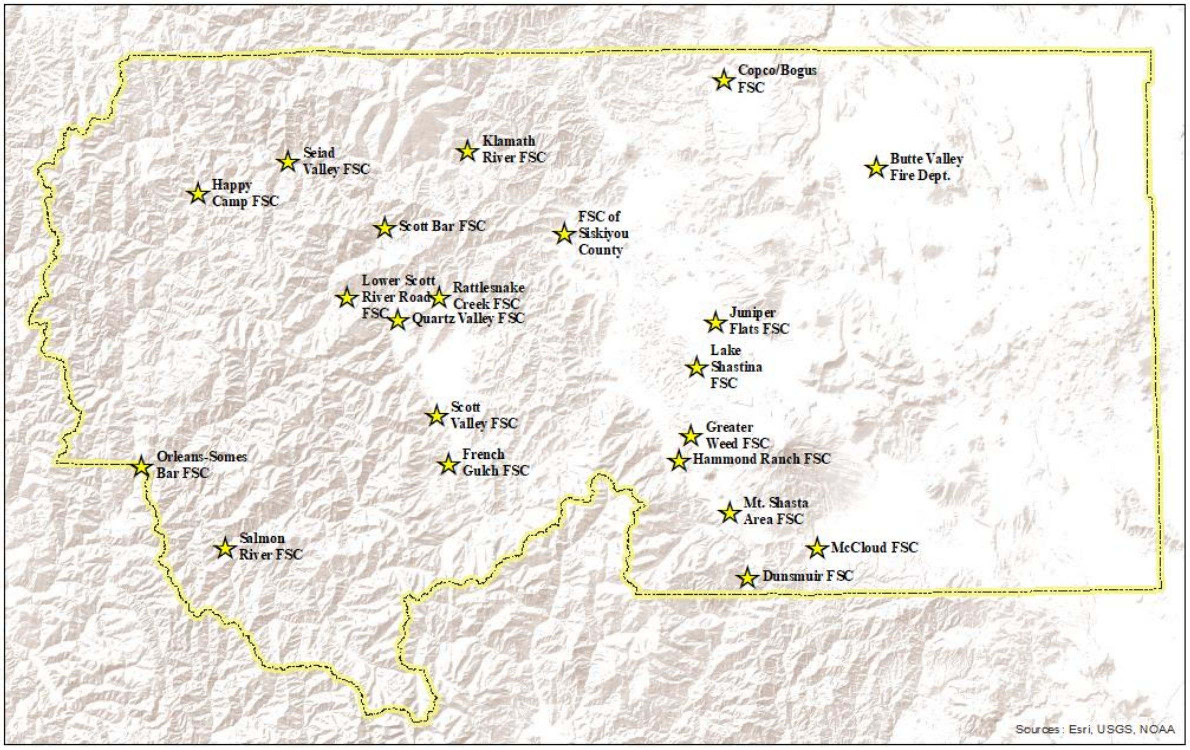
Siskiyou County's vast landscape and relatively low population base scattered through small rural towns and communities poses a challenging environment for implementing consistent wildland fire protection measures. Fire Safe Councils began forming in Siskiyou County in the mid-1990's with many becoming established by the early- to mid-2000's. Currently there are 22 FSC's identified in Siskiyou County by name (Table 2) and location (Figure 1).

Table 2 - Local FSCs – Alphabetical Order

LOCAL FIRE SAFE COUNCILS – SISKIYOU COUNTY	
Black Mountain Fire Safe Council	Lower Scott River Road Fire Safe Council
Butte Valley Fire Safe Council	McCloud Fire Safe Council
Copco/Bogus Fire Safe Council	Mt. Shasta Area Fire Safe Council
Dunsmuir Fire Safe Council	Orleans/Somes Bar Fire Safe Council
French Creek Fire Safe Council	Quartz Valley Area Fire Safe Council
Greater Lake Shastina Fire Safe Council	Rattlesnake Creek Fire Safe Council
Greater Weed Area Fire Safe Council	Salmon River Fire Safe Council
Hammond Ranch Fire Safe Council	Scott Bar Fire Safe Council
Happy Camp Fire Safe Council	Scott Valley Fire Safe Council
Juniper Flat Fire Safe Council	Seiad Valley Fire Safe Council
Klamath River Fire Safe Council	Yreka Fire Safe Council

Note: For local FSC contact information, see Appendix F

Figure 1 – Local FSC's – Geographical Location



In 2002, FSCSC was formed with the intent to help in several aspects of coordination and assistance to the local FSCs. Recognizing that areas not included in a local FSC were lacking assistance in planning, grant acquisition, project development and project implementation, the FSCSC initiated the process to establish the first countywide CWPP, published in 2008 and thereafter providing a resource to all citizens in Siskiyou County for consistent information and guidance about wildland fire protection measures, policy, projects and potential funding mechanisms; and to all communities and local FSCs in their own CWPP efforts. This document supersedes the 2008 Siskiyou County CWPP.

1.4 POLICY AND REGULATORY FRAMEWORK

Knowledge of policies and regulations ensure a path of compliance for the wildfire mitigation recommendations presented in this CWPP. This CWPP is consistent with objectives and policies set forth in federal, state, and county policies and regulations. Relevant policy information which is often referenced in wildfire planning and/or operations is listed and cited in this section. Additional details and links to web sites and source information for the various policies summarized in this section can be found below each section.

1.4.1 California Fire Management Agreement

The 2018-2023 California Master Cooperative Wildland Fire Management and Stafford Act Response Agreement (CFMA) is the principal multi-agency agreement in California that documents a commitment to improve fire management efficiency by facilitating the coordination and exchange of personnel, equipment, supplies, services, information and funds among participating agencies. Only wildland fire and non-wildland fire emergencies or disasters that are Presidentially-declared are covered.
https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd576218.pdf

NOTE

The CFMA is an important agreement listed prior to the documentation of other policy because it is essential to understanding the interaction of respective agencies in their roles and responsibilities during an emergent wildfire response as well as other aspects of wildland fire management.

Lands where State and Federal Agencies are responsible for wildland fire protection are often intermingled and/or adjacent. Wildland fires on these lands may present a threat to land of the other agency. It is to the mutual advantage of the agencies participating in the CFMA to coordinate efforts in the investigation, prevention, detection and response to wildland fire and for projects related to fuels management, including prescribed fire in and adjacent to their areas of responsibility. This improves efficiency and effectiveness and reduces duplication. Table 3 provides a short summary of the key definitions contained in the CFMA that are central to understanding Agency responsibilities and the policies and regulations discussed below.

Table 3 – Key Definitions in the CFMA

KEY DEFINITIONS IN THE CFMA	
Direct Protection Areas (DPAs)	Intermingled and adjacent lands delineated by boundaries regardless of jurisdictional agency. Wildfire protection in these areas are negotiated, created and agreed to by the administrative units of either the Federal Agencies or the State.
Federal Responsibility Area (FRA)	Areas for which Federal Agencies are responsible for wildland fire protection under various federal laws.
State Responsibility Area (SRA)	Sometimes called State and Private lands, these are areas for which the State is responsible for wildland fire protection under California Public Resources Code Sections 4125 and 4127.
Local Responsibility Areas (LRA)	Lands in which a local government agency is responsible for all fire protection. These lands are not part of the CFMA.

Further detail regarding Siskiyou County area agency DPA's and general fire protection and suppression response is addressed in *Section 2.3.1*.

1.4.2 Federal Level Policy

Disaster Mitigation Act (2000–present)

Section 104 of the Disaster Mitigation Act of 2000 (Public Law 106-390) enacted Section 322 - Mitigation Planning of the Robert T. Stafford Disaster Relief and Emergency Assistance Act - that created incentives for state and local entities to coordinate hazard mitigation planning and implementation efforts, and is an important source of funding for fuels mitigation efforts through federal hazard mitigation grants.

https://www.fema.gov/media-library/assets/documents/4596

National Incident Management System (NIMS)

NIMS provides a systematic, proactive approach to guide government agencies, nongovernmental organizations, and the private sector to work together to prevent, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, in order to reduce the loss of life and property and harm to the environment. The NIMS improves a community's ability to prepare for and respond to potential incidents and hazard scenarios.

https://www.fema.gov/pdf/emergency/nims/NIMS_brochure.pdf

National Fire Plan (NFP) 2000

The summer of 2000 marked a historic milestone in wildland fire records for the United States. Dry conditions across the western United States led to destructive wildfire events on an estimated 7.2 million acres, nearly double the 10-year average. Costs in damages including fire suppression activities were approximately 2.1 billion dollars. Congressional direction called for substantial new appropriations for wildland fire management. This resulted in action plans, interagency strategies, and the Western Governor's Association's "*A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment - A 10-Year Comprehensive Strategy - Implementation Plan*", which collectively became known as the National Fire Plan. This plan places a priority on collaborative work within communities to reduce their risk from large-scale wildfires.

https://www.fs.fed.us/database/budgetoffice/NFP_final32601.pdf

Healthy Forest Initiative (HFI) 2002 and Healthy Forest Restoration Act (HFRA) 2003

Enacted in August 2002, the intent of the HFI was to reduce severe wildfire risks that threaten people, communities, and the environment. Congress then passed the HFRA on December 3, 2003 to provide the additional administrative tools needed to implement the HFI. The HFRA strengthened efforts to restore healthy forest conditions near communities by authorizing measures such as expedited environmental assessments for hazardous fuels projects on federal land. This Act emphasized the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects, and places priority on fuel treatments identified by communities themselves in their CWPPs.

https://www.fs.fed.us/projects/hfi/
https://www.forestsandrangelands.gov/resources/overview/hfra-implementation12-2004.shtml

Quadrennial Fire Review (2014)

The Quadrennial Fire Review is a strategic assessment process conducted every four years to evaluate current mission strategies and capabilities against best estimates of future environment for wildland fire management. This integrated review is a joint effort of the five federal natural resource management agencies and their state, local, and tribal partners that constitute the wildland fire management community. The objective is to create an integrated strategic vision document for fire management.

https://www.nifc.gov/policies/pol_ref_QFR.html

National Cohesive Wildland Fire Management Strategy (2014)

The National Cohesive Wildland Fire Management Strategy was initiated in 2009 as a strategic push to work collaboratively among all stakeholders and across all landscapes, using best science, to make meaningful progress towards the three goals: resilient landscapes, fire adapted communities, and safe and effective wildfire response. Its vision is to safely and effectively extinguish wildfire when needed; use wildfire where allowable; manage our natural resources; and as a nation, to live with wildland fire. The work culminated in the National Strategy document, published in 2014.

https://www.forestsandrangelands.gov/strategy/

National Fire Protection Association

The NFPA maintains numerous codes and standards that provide direction on development in the WUI including:

- NFPA 1, Fire Code, Chapter 17
- NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas
- NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting
- NFPA 1143, Standard for Wildland Fire Management
- NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire

https://www.nfpa.org/

National Environmental Policy Act (NEPA)

An important and required element in project planning phases, the NEPA is a United States environmental law that promotes the enhancement of the environment and established the President's Council on Environmental Quality (CEQ). The law was enacted on January 1, 1970. NEPA covers a vast array of federal agency actions, but the act does not apply to state action where there is a complete absence of federal influence or funding.

https://ceq.doe.gov/

1.4.3 State Level Policy

(*NOTE: See Section 1.4.1 for California Fire Master Agreement policy)*

TERMINOLOGY TIP

CAL FIRE: The State of California's agency responsible for fire protection in State Responsibility Areas totaling 31 million acres, as well as the administration of the State's private and public forests. CAL FIRE was formerly referred to as the California Department of Forestry and Fire Protection (CDF), which designation continues to appear frequently in references and documentation.

The Board: State Board of Forestry and Fire Protection, CAL FIRE's policy-development arm.

California Strategic Fire Plan (Version 2018)

The Strategic Fire Plan is one of the preeminent policies specified by the Board. The Board has adopted these Plans since the 1930s and periodically updates them to reflect current and anticipated needs. Over time, as the environmental, social, and economic landscape of California's wildlands has changed, the Board has evolved the Strategic Fire Plan to better respond to these changes and to provide CAL FIRE with appropriate guidance "…for adequate statewide fire protection of state responsibility areas" (PRC § 4130). This 2018 Plan reflects CAL FIRE's focus on (1) fire prevention and suppression activities to protect lives, property, and ecosystem services, and (2) natural resource management to maintain the state's forests as a resilient carbon sink to meet California's climate change goals and to serve as important habitat for adaptation and mitigation.

http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fpppdf1614.pdf

State of California Hazard Mitigation Plan (Version 2013; update in progress)

The purpose of the State Hazard Mitigation Plan (SHMP) is to significantly reduce deaths, injuries, and other losses attributed to both natural and human-caused hazards in California. The SHMP provides guidance for hazard mitigation activities emphasizing partnerships among local, state, and federal agencies as well as the private sector.

https://www.caloes.ca.gov/HazardMitigationSite/Documents/002-2018%20SHMP_FINAL_ENTIRE%20PLAN.pdf

Public Resource Code Sections 4125-4137 – Fire Protection Responsibilities

This policy defines suppression and prevention roles and responsibilities of the incumbent agencies within and across administrative boundaries. Fire protection responsibility area designations directly correlate to specific financial responsibility for wildfire prevention and suppression actions. Area mutual aid agreements and assistance agreements are reviewed on a regular (annual) basis, to ensure accuracy in updates and procedures.

https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&division=4.&title=&part=2.&chapter=1.&article=3

Public Resource Code Sections 4201-4204 – Fire Hazard Severity Zones

Provides for the classification of lands within State Responsibility Areas (SRA – see Section 2.2.1 for details) in accordance with the severity of fire hazard present for the purpose of identifying measures to be taken to slow wildfire rates of spread and to reduce the potential intensity of uncontrolled fires that threaten to destroy resources, life, or property. These measures are part of an overall strategy to implement community adaptability in the wildfire environment.

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&division=4.&title=&part=2.&chapter=1.&article=9

Public Resources Code Section 4290

This provision grants authority to the Board to develop and implement fire safety standards for defensible space on SRA lands. These regulations apply to the perimeters and access to all residential, commercial, and industrial building construction within state responsibility areas approved after January 1, 1991.

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=4290.&lawCode=PRC

Public Resources Code Section 4291 and California Code of Regulations (CCR) 1299.1

A state law, effective in January 2005, this section extends the required defensible space clearance around homes and structures from 30 feet to 100 feet for wildfire protection. The code applies to all lands that have flammable vegetation. The regulations include several requirements for how the vegetation surrounding buildings and structures should be managed to create defensible space.

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=4291.&lawCode=PRC

Public Resources Code 4292-93, 4296 and 14 CCR 1256: Fire Prevention for Electrical Utilities

These statutes and regulations address the vegetation clearance standards for electrical utilities. They include the standards for clearing around energy lines and conductors such as power line hardware and power poles. These regulations are critical to wildland fire safety because of the substantial number of power lines in wildlands, the historic source of fire ignitions associated with power lines, and the extensive damage that results from wildfires caused by power lines in severe wind conditions.

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?division=4.&chapter=3.&part=2.&lawCode=PRC

Public Resource Code Section 4296.5 – Railroads – CCR 1290 Railroad Right-Of-Ways

Established in 1999, this code empowers the Board Director to adopt regulations establishing fire prevention and hazard reduction standards that any Railroad Corporation or person owning a Railroad in this state must abide by. The resulting formulated PRC 4296.5 regulations are found in the California Code of Regulations (CCR's), Title 14; Article 2; Sections 1290 through 1295.

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PRC&sectionNum=4296.5

Public Resource Code Section 4421-4446 – Prohibited Activities

This series of codes specifies the prohibited human actions regarding setting fire or causing fire to be set to any forest, brush, or other flammable material which is on any land that is not his own, or under his legal control, without the permission of the owner, lessee, or agent of the owner or lessee of the land. Proper burn permitting needs are identified. Prohibited actions involving use of noncompliant industrial and/or mechanical equipment is also cited.

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&division=4.&title=&part=2.&chapter=6.&article=2

Public Resource Code Sections 4475-4480 – Department of Forestry Burning Contracts

Discloses how the Board Director may enter into an agreement for prescribed burning or other hazardous fuel reduction that is consistent with this chapter and the regulations of the Board with either the owner or any other person who has legal control of any property, any public agency with regulatory or natural resource management authority over any property that is included within any wildland, or any nonprofit organization; given that the burn complies with specified set of purposes.

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&division=4.&title=&part=2.&chapter=7.&article=2

Public Resource Codes 4491-4494 – Private Burning of lands Under Permit

Cooperation by CAL FIRE, as provided in this article, is declared to be for a public purpose when a private person desires to use prescribed burning as a means of converting brush-covered lands into forage lands or to help meet wildland management goals, which has as its objective the prevention of high intensity wildland fires, watershed management, range improvement, vegetation management, forest improvement, wildlife habitat improvement, restoring ecological integrity and resilience, community wildfire protection, carbon resilience, enhancement of culturally important resources, and maintenance of air quality, or any combination thereof.

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&division=4.&title=&part=2.&chapter=7.&article=3

Public Resources Code 4741 - Wildland Fire Prevention and Vegetation Management

In accordance with policies established by The Board, CAL FIRE shall assist local governments in preventing future wildland fire and vegetation management problems by making its wildland fire prevention and vegetation management expertise available to local governments to the extent possible within the department's budgetary limitations. Department of Forestry recommendations shall be advisory in nature and local governments shall not be required to follow such recommendations.

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&division=4.&title=&part=2.&chapter=10.&article=8

2016 California Fire Code

This code establishes regulations affecting or relating to structures, processes, premises and safeguards regarding residences and historic buildings. The code includes: 1) hazards of fire and explosion arising from the storage, handling or use of structures, materials or devices; 2) conditions hazardous to life, property or public welfare in the occupancy of structures or premises; 3) fire hazards in the structure or on the premises from occupancy or operation; 4) matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems; and 5) conditions affecting the safety of fire fighters and emergency responders during emergency operations. Most of these codes are available in full at the following CAL FIRE web site.

http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes

California Building Code 2016 Chapter 7A (includes section 705A – roofing)

Establishes minimum standards for the protection of life and property by increasing the ability of a building located in any FHSZ within SRA or any WUI fire area to resist the intrusion of flames or burning embers projected by a vegetation fire and contributes to a systematic reduction in conflagration losses.

http://www.fire.ca.gov/fire_prevention/downloads/ICC_2009_Ch7A_2007_rev_1Jan09_Supplement.pdf

California Code of Regulations Title 14, 1270.04 (relates to PRC 4290)

This subchapter specifies the following directives: (a) local jurisdictions shall provide the Board Director with notice of applications for building permits, tentative parcel maps, tentative maps, and use permits for construction or development within a SRA, (b) the Board Director shall review and make fire protection recommendations on applicable construction or development permits or maps provided by the local jurisdiction, and (c) the local jurisdiction shall ensure that the applicable sections of this subchapter become a condition of approval of any applicable construction or development permit or map.

http://www.fire.ca.gov/fire_prevention/downloads/Title_14.pdf

California Code of Regulations Title 24 (published July 1, 2016; with an effective date of January 1, 2017)

This code is reserved for state regulations that govern the design and construction of buildings, associated facilities and equipment. These regulations are also known as building standards (per California Health and Safety Code Section 18909). Health and Safety Code Section 18902 gives CCR Title 24 the name California Building Standards Code. Title 24 applies to all building occupancies and related features and equipment; contains requirements for structural, mechanical, electrical, and plumbing systems; requires measures for energy conservation, green design, construction and maintenance, fire and life safety, and accessibility.

http://osfm.fire.ca.gov/strucfireengineer/pdf/bml/t-19.pdf
https://www.dgs.ca.gov/BSC/Codes

Government Code 51175-51189: Chapter 6.8 - Very High Fire Hazard Severity Zones

This code defines Very High Fire Hazard Severity Zones (VHFHSZ) and designates lands considered by the State to be a very high fire hazard. The purpose of this chapter is to classify lands in the state in accordance with whether a very high fire hazard is present so that public officials are able to identify measures that will retard the rate of spread, and reduce the potential intensity, of uncontrolled fires that threaten to destroy resources, life, or property, and to require that those measures be taken. For more detail and a discussion regarding wildland fire hazard severity in general and VHFHSZ's specifically, see Section 5.1.

https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=GOV&division=1.&title=5.&part=1.&chapter=6.8.&article

Government Code 51189: WUI Building Standards (referenced from Ch. 6.8 in paragraph above, for emphasis)

This code directs the Office of the State Fire Marshal to create building standards for wildland fire resistance. The code includes measures that increase the likelihood of a structure withstanding intrusion by fire (such as building design and construction requirements that use fire-resistant building materials) and provides protection of structure projections (such as porches, decks, balconies and eaves) and structure openings (such as attics, eave vents, and windows). For more detail and further discussion on WUI building standards, see Section 5.4.

https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV&sectionNum=51189

Government Code 65302.5: General Plan Fire Safety Element Review

This statute requires the Board to provide recommendations to a local jurisdiction's General Plan fire safety element at the time that the General Plan is amended. While not a direct and binding fire prevention requirement for individuals, General Plans that adopt the Board's recommendations will include goals and policies that provide for contemporary fire prevention standards for the jurisdiction.

https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV&sectionNum=65302.5

California Health and Safety Code: DIVISION 12. FIRES AND FIRE PROTECTION; Chapter 1 Liability in Relation to Fires; Section 13000

Every person is guilty of a misdemeanor who allows a fire kindled or attended by him to escape from his control or to spread to the lands of any person other than the builder of the fire without using every reasonable and proper precaution to prevent the fire from escaping.

http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=HSC&division=12.&title=&part=1.&chapter=1.&article

California Environmental Quality Act (CEQA)

The 1970 CEQA has evolved into one of the most prominent components of community planning in California. It requires state and local agencies to follow a protocol of analysis and public disclosure of environmental impacts in proposed projects and to include feasible measures to mitigate those impacts. Proposed hazardous fuel treatment projects recommended in community or countywide level CWPPs must comply with CEQA regulations.

https://oag.ca.gov/environment/ceqa

Senate Bill 979: Water Quality, Supply, and Infrastructure Improvement Act of 2014: Protecting Rivers, Lakes, Streams, Coastal Waters, and Watersheds

This Act is a useful reference during planning and implementation of fuel treatment projects to reduce wildfire risk, because it can help to ensure those projects account for the protection and restoration of California's rivers, lakes, streams and watersheds, protect watersheds tributary to water storage facilities, and promote watershed health. It also determines priorities for water security, climate, and drought preparation.

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB979

California Civil Code 1103.C.3: Law Governing Natural Hazard Disclosure

TRANSFER OF REAL PROPERTY: Disclosure of Natural and Environmental Hazards: Article (3) A transferor of real property that is located within a very high fire hazard severity zone, designated pursuant to Section 51178 of the Government Code, shall disclose to any prospective transferee the fact that the property is located within a very high fire hazard severity zone and is subject to the requirements of Section 51182 of the Government Code. (details go on to include): (A) information regarding property transferor (B) information regarding agency, county assessor and map documentation.

https://california.public.law/codes/ca_civ_code_section_1103

1.4.4 Local Policy

Unit Strategic Fire Plan, Siskiyou Unit, CAL FIRE (version 2017)

This CAL FIRE plan is a framework established to protect the people and resources of Siskiyou County. The plan covers 1.2 million acres, approximately 32 percent of Siskiyou County lands. It provides specific pre-fire planning and suppression strategy guidance for each of CAL FIRE's four area Battalions: Scott Valley, Shasta Valley, Butte Valley/Weed and McCloud.

http://cdfdata.fire.ca.gov/fire_er/fpp_planning_plans_details?plan_id=281

Siskiyou County Code of Ordinances; Title 3: Chapter – Fire Hazards and Fire Permits

This chapter is known as the "Siskiyou County Fire Control and Fire Hazard Regulations". The purpose of this chapter is to further the public interest, welfare, and safety by providing regulations concerning the maintenance of flammable materials including fire breaks and enforcement and other fire hazards. It also addresses the requirement of fire permits in the unincorporated area of the County.

https://library.municode.com/ca/siskiyou_county/codes/code_of_ordinances?nodeId=TIT3PUSA_CH3FIHAFIPE

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SECTION 2. COUNTY OVERVIEW

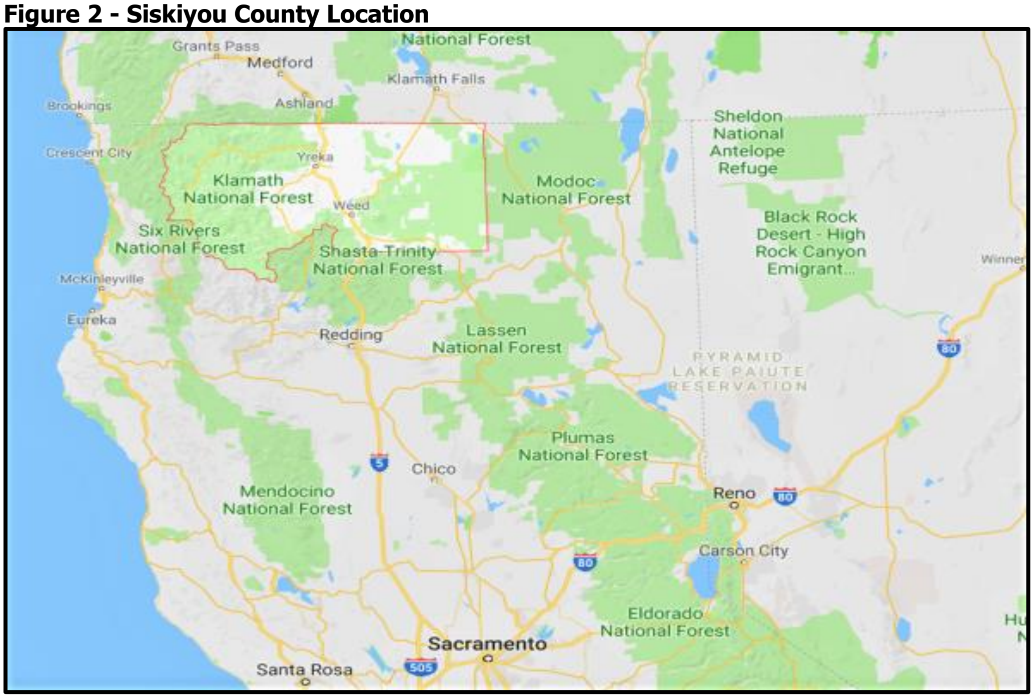
Siskiyou County lies at the northern end of California and at the southern end of the Klamath Mountains (see Figure 2). It covers approximately 4,017,850 acres and is divided approximately into eastern and western halves by Interstate 5, with the larger population centers occurring along the highway. The population is 43,853 (U.S. Census Bureau, 2017) with approximately 54% residing in unincorporated communities (California Department of Finance, 2011). Of the 33 communities in the County, 9 are incorporated cities or towns.

The western half of the County is mountainous and relatively undeveloped. The area is dominated by steep mountains and numerous rivers, although it is the home of the Scott Valley, which is an agricultural center. Dominant industries include timber harvesting, mining and ranching. Hunting, fishing, camping and backpacking attract many visitors to the area.

Approximately 60% of lands in the County are managed by five National Forests – Klamath (KNF), Shasta-Trinity (SHF), Modoc (MDF), Six Rivers (SRF), and Rogue-Siskiyou (RSF); with KNF and SHF in a primary federal management role. Additional public land management includes the U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, National Park Service, U.S. Bureau of Indian Affairs, California State Land Commission, and California Department of Fish and Wildlife.

Siskiyou County is a desirable destination for outdoor recreation as well as for new age travelers and artists of many types. Its historic small towns have found many ways to attract visitors. Tourists, and some residents, are often unaware of the area's fire history and high likelihood of future wildfire. The combination of warm, dry weather in the summer combined with lightning from thunderstorms contributes to numerous fires each year. Human-caused fires in WUI areas are increasingly problematic.

Figure 2 - Siskiyou County Location

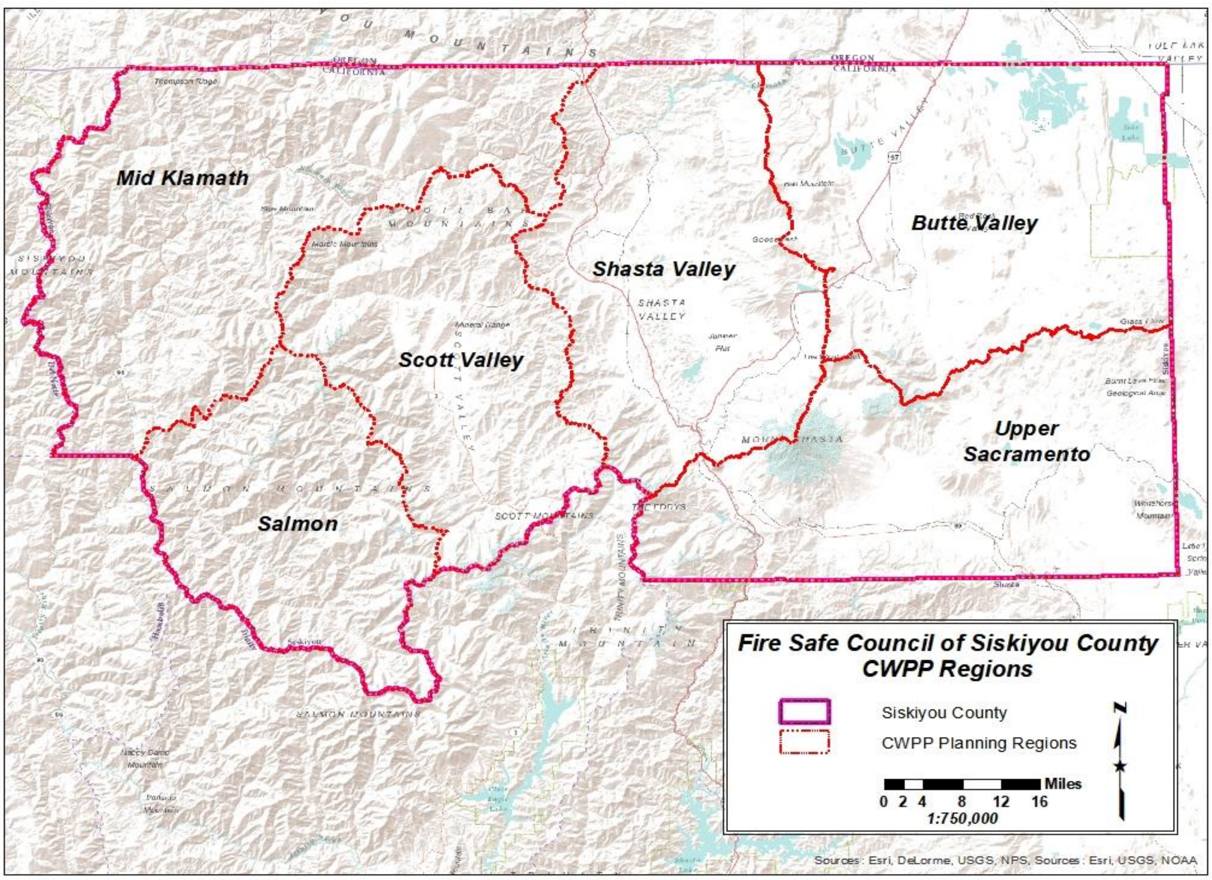


2.1 GEOGRAPHIC SCOPE | PLANNING REGIONS

Due to its extensive size and complexity, Siskiyou County is divided into six sub-sections for planning and organization purposes (a decision made during development of the 2008 CWPP). In this updated CWPP, these same geographic divisions have been maintained, with each individual subsection termed a "Planning Region" (PR). Each PR has a title based on a primary or known geographic feature. The intent of this methodology is to direct the wildfire assessment to features and needs of a focused area and produce a more meaningful and useful set of planning tools. The data and information provided in these PRs will be of considerable value to each of the communities within them by providing updated tools to include in their local CWPPs.

The six PRs depicted in Figure 3 are Butte Valley; Mid-Klamath; Salmon; Scott Valley; Shasta Valley; and Upper Sacramento. See *Part II. Planning Regions (1-6)* for detailed PR assessments.

Figure 3 – Planning Regions



In these updated assessments, past fire behavior considerations in two of the six PRs (Mid-Klamath and Upper Sacramento) prompted an additional sub-division option due to substantial geographic differences that affect fire growth potential. Further discussion of this aspect is found in the individual PR sections for those two regions.

2.2 VALUES AT RISK

A community's values include structures, critical infrastructure, businesses, and other tangible elements; but values can also include intangible elements such as natural resources, sensitive species, cultural and historical resources, visual resources, and how residents feel about their community and the landscapes around them.

Although intangible values are difficult to address in mitigating wildfire hazard and risk, actions can be taken to protect those values by developing strategies that reduce the wildfire threat overall. The challenge for Siskiyou County is to balance the level of hazard mitigation work required to protect one set of values without compromising others.

Siskiyou County's community members who participated in early public meetings emphasized the importance of protecting the following key values:

- Life Safety
- Homes/Structures/Neighborhoods
- Critical Infrastructure and Municipal Facilities
- Natural and Historic Resources
- Recreation Amenities/Facilities

Actions to protect these values are discussed in more detail in *Section 6.2. Protecting Values*.

2.2.1 Life Safety

Siskiyou County's highest priority in the event of wildland fire is human life safety and the physical well-being of all people in the community. Recent wildfires that have threatened the County – including the 2014 Boles and the 2018 Klamathon and Delta fires - resulted in public evacuations, firefighter and civilian injuries, and one civilian death.

The complex nature of this County's WUI presents numerous life safety issues to consider during a wildfire, including decisions regarding evacuation, transport of vulnerable or functional-needs populations, locations of temporary shelters, access and egress issues, restricted and/or congested transportation systems, lack of defensible space, and structure vulnerability. Based on U.S. Census Bureau population density data, the Mount Shasta area has the highest concentration of individuals in the County, followed by areas north along Interstate 5, Highway 3 in Scott Valley, and Highway 97 in Butte Valley; and south on Highway 89 (see *Section 4. Communities at Risk, Figure 20 Siskiyou County Communities at Risk with WUI Boundaries*).

Often during wildfire events, emergency responders issue evacuation notifications to residents, visitors, and business owners for protection of their life safety. A few individuals may choose not to evacuate immediately and stay to defend their properties, or decide to shelter in place until the fire danger passes (see *Section 6. Action Plan Guidance* for details). Some residents believe a secondary evacuation notification will be issued prior to conditions becoming truly life threatening. These actions can put the lives of these individuals - as well as those of firefighters and law enforcement personnel - at risk.

Vulnerable or functional-needs populations have special needs and may be less likely to respond to, cope with, and recover from a wildfire. These individuals are also less likely to get involved in wildfire mitigation activities (Ojerio, 2008). In 2016, the United States Census Bureau estimated that Siskiyou County had approximately 8,800 disabled residents (http://factfinder.census.gov).

Age, along with physical and mental limitations, can restrict mobility, making it more difficult for these individuals to evacuate in a disaster. Lack of financial resources may hinder the ability for low-income populations to invest in emergency preparedness or mitigation measures as well as recover from loss. Language issues can result in communication barriers to evacuation or support services. Planning for vulnerable or functional-needs populations is important to consider and gauge.

NOTE

Vulnerable or functional-needs populations include those who are physically and/or mentally disabled (blind, cognitive disorders, mobility limitations), limited or non-English speaking, culturally isolated, medically or chemically dependent, homeless, deaf and hard-of-hearing, frail elderly, and children.

Another life safety consideration is the presence of short-term residents, visitors, and/or guests. It is unknown how many people visit the Siskiyou County area at any given time, but hiking trails, businesses, hotels, recreation facilities/amenities, short and long-term home rentals, and vacation homes pose another element of risk. Individuals enjoying these attractions and lodgings are likely not familiar with the wildfire threat, road systems, evacuation routes in specific, or generally what to do in the event of evacuation. In addition, they may bring with them inaccurate notions of a wildfire and operational responses and capabilities. There is also a significant transient population that is difficult to track or alert to emergency situations.

Pets, service animals, and large domestic animals are also vulnerable populations when considering evacuation planning. Animals can become frightened and more difficult to manage during a wildfire, and many emergency shelters and evacuation centers deny admission to pets for health and safety concerns (with the exception of service animals). Pets and large domestic animals can face death or suffering due to poor disaster planning by their human caretakers. Furthermore, people have risked their lives and the lives of others to save their pets. Homeowners may be unwilling to evacuate or enter a shelter during an emergency without their animals, instead choosing to remain in harm's way.

2.2.2 Homes/Structures/Neighborhoods

Structure and property loss due to wildfire is noted in Siskiyou County's historical records since the early 1900's. The sobering reality of this destruction in recent years occurred during the 2014 Boles Fire and 2018 Klamathon Fire. During the Klamathon blaze, over 1,511 people were forced to evacuate as the fire started southeast of Hornbrook and quickly raced out of control, pushed by hot, dry wind.

2018 Klamathon Fire, Hornbrook area
Courtesy of Patrick Titus, Cal

Whether or not a structure survives depends primarily on exterior construction material, structure design, housing density, placement relative to nearby homes, geographic location, and whether the structure has adequate defensible space.

Most housing in Siskiyou County consists of single family homes on lots that vary widely in size. The greatest densities of homes are in small cities and rural towns (see Figure 4) where homes are more tightly spaced, allowing a wildfire to more easily spread from structure to structure. Once ignited, structure fires threaten adjacent structures and improvements with their long burn time, intense radiant and convective heat, and the production of burning embers transported in the air to other structures and fuels.

Numerous factors surrounding a communities' structural issues can and have resulted in the loss of structures in Siskiyou County during wildfires.

Structural vulnerability, defensible space, and access/egress issues are covered in detail in *Section 5.4 Structural Vulnerability* and *Section 6. Community Preparedness*.

The enactment of stringent building codes targeted at improving fire resistance can significantly reduce the potential loss of residential structures; however, new codes and policies will not completely eliminate the risk. Structure loss can still occur. A study of the 2007 wildfires in San Diego County revealed that the fires destroyed 13% of homes within the fire perimeters. Homes built under building codes enacted in 2001 had a loss rate of 4%, while homes built under fire codes modified in 2004 had a loss rate of only 2% (Rahn, 2009). Figure 5 depicts the number of structure destroyed by wildfire in California from 1989 through 2017.

Devastation in the path of northern California's 2017 and 2018 wildfires has resulted in unprecedented financial toll on homeowners, businesses and entire communities. For individual homeowners, in addition to the expense of rebuilding a home, there are repair or replacement costs for smoke damage, living expenses while rebuilding, re-landscaping costs, and replacement of personal belongings and vehicles. The emotional toll of losing family heirlooms, family pictures and keepsakes, or other priceless belongings is incalculable. Many homeowners do not purchase even the most basic hazard insurance and/or may be underinsured, thus exacerbating the financial burden faced.

Figure 4 – Population/Housing Density (FRAP CAL FIRE, 2010)

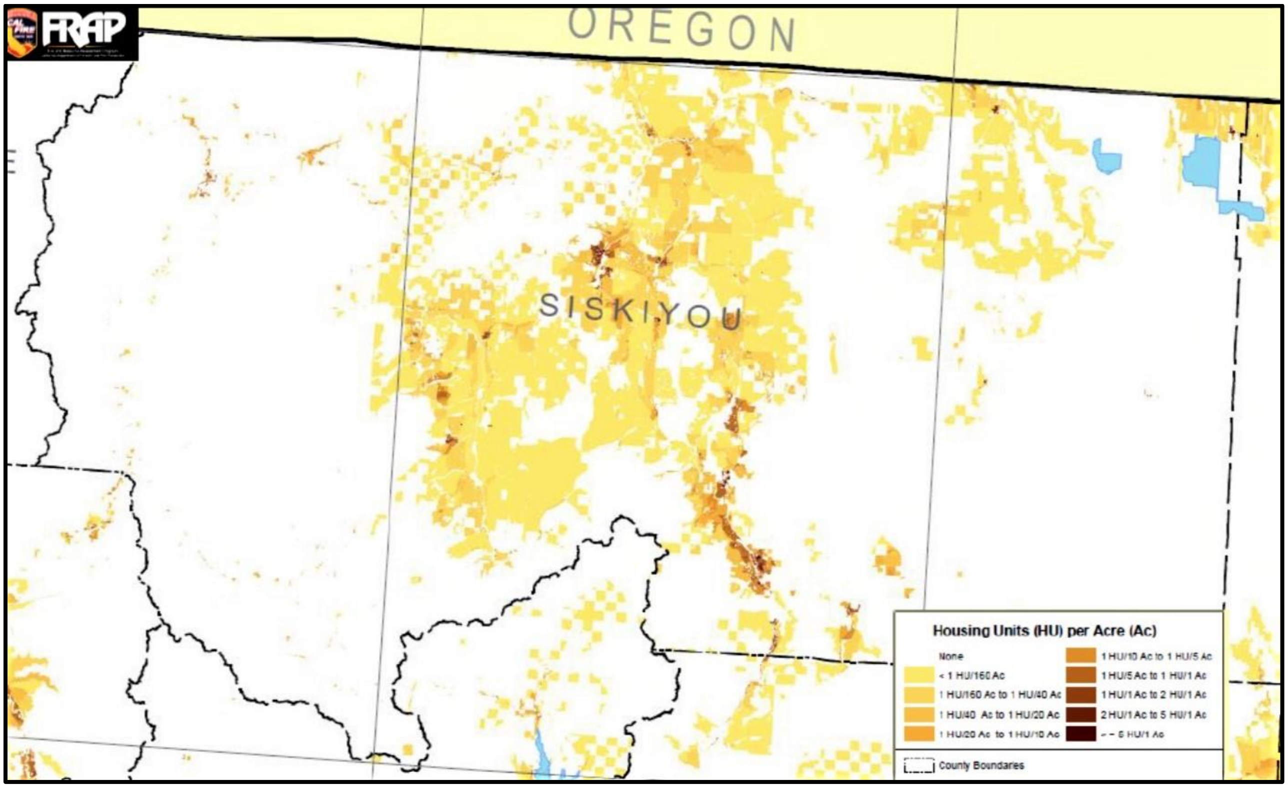
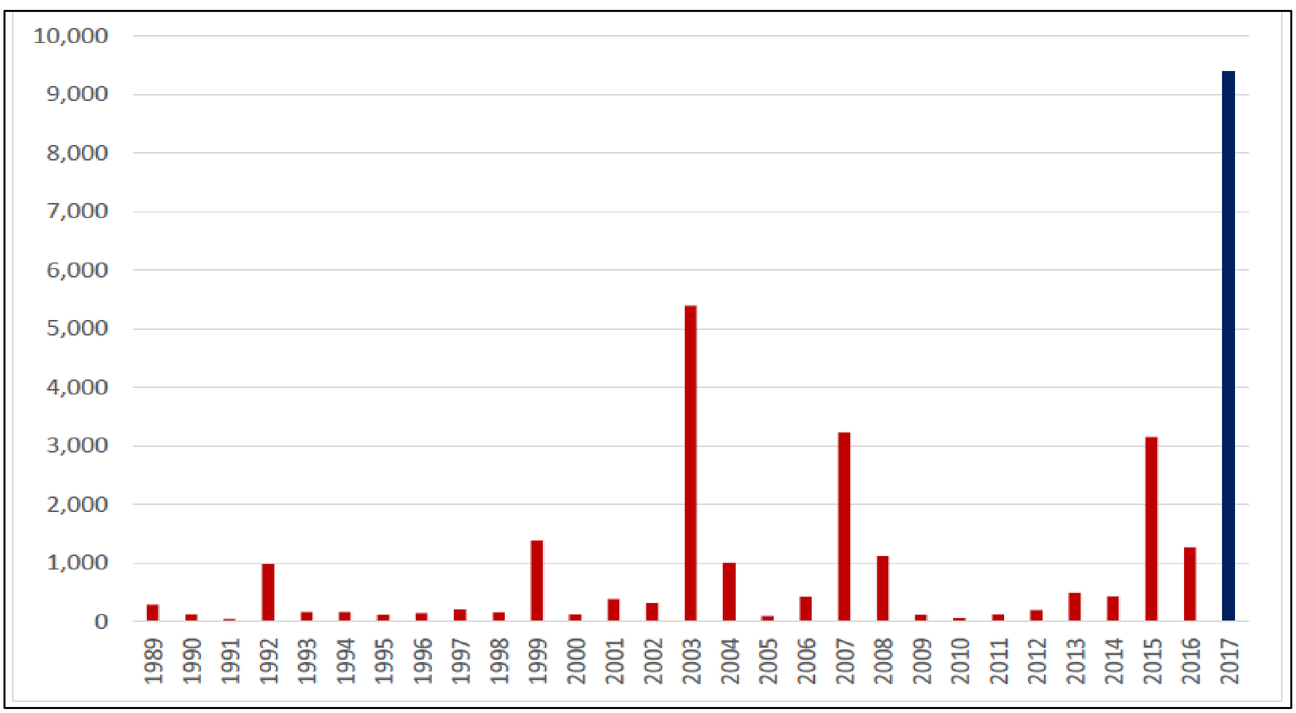


Figure 5 - Structures Destroyed by California Wildfire 1987-2017



Source: Cal Fire. Note: Cal Fire has not yet finalized their 2017 data and the numbers shown here reflect only structures destroyed by five of the 2017 fires (Tubbs, Nuns, Thomas, Atlas, and Redwood Valley).

2.2.3 Critical Infrastructure and Municipal Facilities


2018 Delta Fire at Interstate 5
Courtesy of Patrick Titus, Cal OES

Wildfires can cause significant damage to critical infrastructure and municipal facilities and affect water resources, resulting in substantial economic losses. The 2018 Klamathon Fire was a clear example as Interstate 5 and the Central Oregon and Pacific Railroad lines were closed, causing financial impacts to commercial shipping; hydropower assets and facilities including Iron Gate Reservoir, Copco Lake, and the Hornbrook water system were also threatened.

Added to the costs of repairing or rebuilding municipal facilities are those of lost work time, temporary rental of other buildings or offices, and moving expenses. Wildfire losses can reduce tax revenues in a number of categories such as sales and county taxes, as well as business revenue and property loss that accumulate over the long term. Private and commercial properties that escape damage in the fire may still experience dramatic drops in value as the area recovers.

Economic and financial losses can have long-term effects on a community's economic vitality. It can take days, weeks, or months to repair critical infrastructure, restore services, and rebuild businesses following a wildfire. Taxpayers feel the squeeze of these repairs as each state typically reimburses the majority of costs incurred by the companies paying for the repairs (Diaz, 2012).

Roads

Areas outside of incorporated communities have limited options for access/egress with many road systems having only one access/egress route. Road systems within the County can quickly become congested during a wildfire as evacuations of the public and responding emergency services personnel compete for space on primary travel routes within and adjacent to communities. Additional infrastructure impediments include: narrow winding roads, steep roads, vegetation encroachment into roadways, gates, bridges, addresses not clearly visible from the road systems, unlit roads and intersections, unlit street signage, and limited turnaround capabilities.

During the Boles Fire, heavy traffic on Interstate 5 led to delays in first responders reaching the fire. The Klamathon and Delta fires resulted in the closure of Interstate 5, with the use of alternate routes on smaller road systems leading to traffic congestion and collisions.

Utilities, Facilities, Services

Repairing and/or replacing critical infrastructure and restoring basic services after a disaster is a top priority for both public and private agencies and utility companies. Damage to electric power, satellite and cable communications, roadways, railroads, water district assets, and fire and police facilities can impact hospitals, stores, schools and other public services. These agencies and companies can incur significant repair, restoration, and rehabilitation costs.

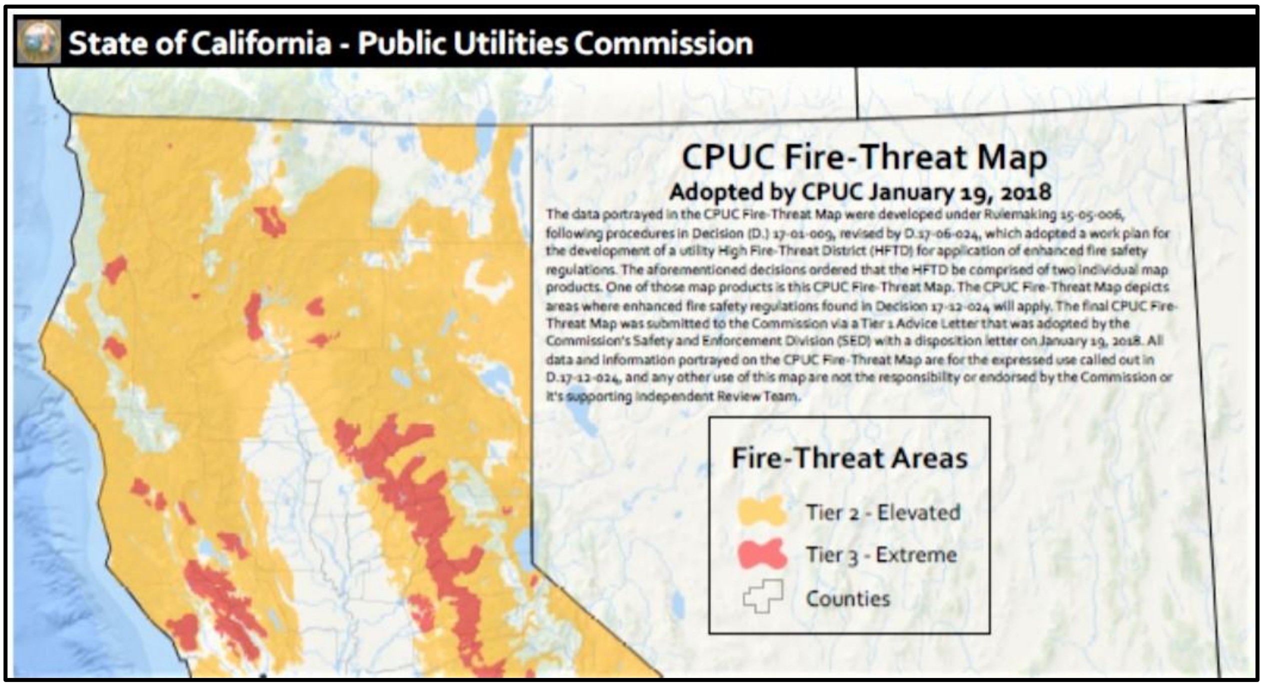
As an example of severe infrastructure outcomes, for wildfires that occurred in 2017 alone, Pacific Gas and Electric (PG&E) is expected to have to pay at least $2.5 billion and possibly

NOTE

As part of its commitment to reducing wildfire risk, in February 2019 PG&E submitted its 2019 Wildfire Safety Plan. This updated plan includes additional safety precautions and a significantly expanded Public Safety Power Shutoff program. This affects transmission lines that pass through areas designated by the California Public Utilities Commission (CPUC) as Fire Threat Areas Tier 2 (Elevated) and Tier 3 (Extreme). See Figure 6 for the northern California portion of the CPUC's Fire-Threat Map.

much more in liability damages. Following the catastrophic 2018 fires, on January 14, 2019, PG&E announced that it was filing for Chapter 11 Bankruptcy in response to the financial challenges associated with 2017 and 2018 Northern California wildfires (Kousky et.al, 2018)

Figure 6 – CPUC Fire-Threat Map (http://cpuc.ca.gov/FireThreatMaps)



NOTE: There is a PG&E Tier 3 portion of Siskiyou County in the vicinity of Somes Bar where an estimated 100 homes will be affected by the upcoming Public Safety Power Shut Off program.

Water resources

Rivers, lakes, ponds, tanks, and wells compose a network of water sources that supply our communities, representing a key infrastructure element. During a wildfire emergency this water source network becomes a critical factor for suppression personnel in conducting safe and effective operations, including evacuation assistance. It is imperative that each community discuss specific area water resources issues with their local fire suppression representatives and that community leaders ensure the subject is addressed in their local level CWPP.

2.2.4 Natural and Historic Resources

The range of impacts on natural and historic resources from wildfire can vary from no effect, to temporary alteration, to major damage and/or complete destruction. The following provides a general description of these resources and their importance.

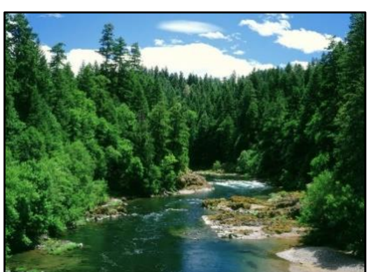
Natural Resources

Natural resources are the life blood of Siskiyou County, central to supporting citizens economically, culturally and simply for the joy of the extensive beauty added to daily lives. (County of Siskiyou, CA website, 2018).

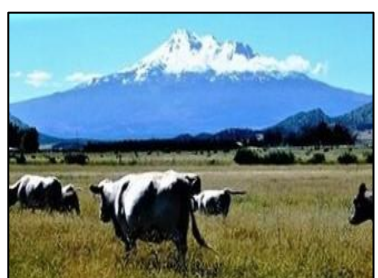
Large expanse of mixed conifer forest

The County's unique setting is dominated by steep mountainous terrain often covered in thick coniferous forests with more timber management/production activity than any other part of the state. Forested watersheds are home to the Klamath River water system, one of the state's priceless water sources. Besides supplying California's extensive agriculture industry, the Klamath River system supports chinook salmon, coho salmon and steelhead trout. Coho salmon are federally listed as a threatened species under the Endangered Species Act and the Klamath River is designated as critical habitat. The Klamath River Basin is also home to mule deer, elk, pronghorn antelope, cougar, black bear, and river otters. Over 430 wildlife species, including 263 bird species, have been observed in the basin. Dozens of these species are considered to be "of concern" or "at risk" by the US Fish and Wildlife Service and the states of Oregon and California due to habitat loss and declining populations. Because of its importance to fish and wildlife, and the fact that it still represents the largest freshwater wetlands west of the Mississippi River, conservationists have long called the Klamath River Basin the "Everglades of the West" (Oregon Wild, 2018).

Large expanses of uninhabited wildland support a significant range of habitats suitable for native birds and animals. Open grassland valley areas between the mountain ranges allow for substantial grazing opportunities that support the cattle and livestock industry.



Klamath River
Courtesy of Land Equities



Livestock/grazing
Montague area

Siskiyou County is one of the few counties in California with staff specifically assigned to natural resource policy. Commercial activity associated with agriculture, forestry, mining, water and power generation and recreational activities such as camping, fishing, hunting and sight-seeing all involve matters of policy and require important planning work with interagency resources specific to wildfire issues.

Natural resources damaged by wildfire can take years to recover and require significant and unique restoration activities. Additionally, post-fire events such as flooding can create significant damage to watersheds and additional damage to habitat. Subsequent impacts may also include an increase in invasive species and erosion.

Mount Shasta

Scenic resources such as Mount Shasta and the alpine lakes of the Marble Mountains are of significant importance to those who live in and visit Siskiyou County, a profound appreciation stretching back centuries.Wildfire impacts on scenic resources are generally temporary as the post-fire blackened landscape begins to regrow in the first spring after a wildfire. However, severe wildfire destruction of timbered forestlands can take decades to recover and, in some cases, will not return at all due to lack of seed and/or adverse climatic changes. Finding a balance with community wildfire protection planning and protection of natural resources is a goal of this plan.

NOTE

"When I first caught sight of it I was weary and 50 miles away and afoot. Yet all my blood turned to wine, and I have not been weary since."

-- Author John Muir, upon seeing Mount Shasta in 1874.

Historic Resources

Historic resources are an important value to the community. They include archaeological sites and historic sites, buildings, structures, and landscapes.

Siskiyou County landscapes and communities are rich with historical landmarks. Some of these resources are listed and preserved through historical preservation society sponsorships, grants and museums; but many exist unprotected and somewhat unknown, having withstood the true test of time. Some of these sites are located in well-maintained areas; however, wildfires can pose a serious threat to these resources.

Edgewood Store

Many archaeological sites are prone to human disturbance and wildfire exposure. Under the National Historic Preservation Act, protection of known archaeological resources must occur during all fire suppression and fuel treatment activities. Fire protection planning should include awareness and understanding of the inherent hazards and risks that wildfire poses to historic and cultural values.

2.2.5 Recreation Amenities/Facilities

Siskiyou County is well renowned locally, statewide, nationally and internationally for its outdoor recreation amenities and facilities including incredible mountains, alpine lakes, extensive trail systems, river/water sports, skiing, mountain biking, as well as public parks and camping facilities. Damages following wildfire can significantly impact recreational opportunities for months or years.

On the southernmost portion of Siskiyou County, Castle Crags Wilderness is home to avid rock climbers and hikers, displaying unique towering granite monoliths (visible from the Interstate 5 corridor) and amazing vistas. Both Shasta-Trinity and Klamath National Forests boast a wide array of recreational opportunities, with over 500,000 visitors per year. Siskiyou Lake and McCloud Reservoirs are popular for fishing, family camping and water sports.

Castle Crags

Each year, Mount Shasta Wilderness, the Mount Eddy and Klamath Ranges, and Marble Mountains attract thousands of hikers including Pacific Crest Trail enthusiasts. Major river corridors including the Trinity, Klamath, Salmon and Sacramento rivers provide some of the best fly fishing in the world and are also well known for rafting and kayaking.

The impacts of wildfires to recreational opportunities include the loss and/or degradation of recreation facilities and related structures; trail integrity due to post-fire flooding and slides; scenic values; wildlife viewing experiences; water quality; and spending by visitors in local businesses. Closures due to wildfire activity or post-fire resource damage can limit or eliminate recreational opportunities to visitors and the community. The devastating 2018 wildfires were a significant deterrent to visitors, and recreation and businesses throughout the County suffered financial losses during the peak summer tourism season. The brown smoke-filled skies prevailed nearly all summer long, as large destructive fires throughout the area affected air quality from early July to early October. This seemingly never-ending wildfire smoke deterred visitors and made being outdoors extremely unhealthy and uncomfortable, causing cancellation or postponement of outdoor sporting and social events.

2.3 FIRE PROTECTION

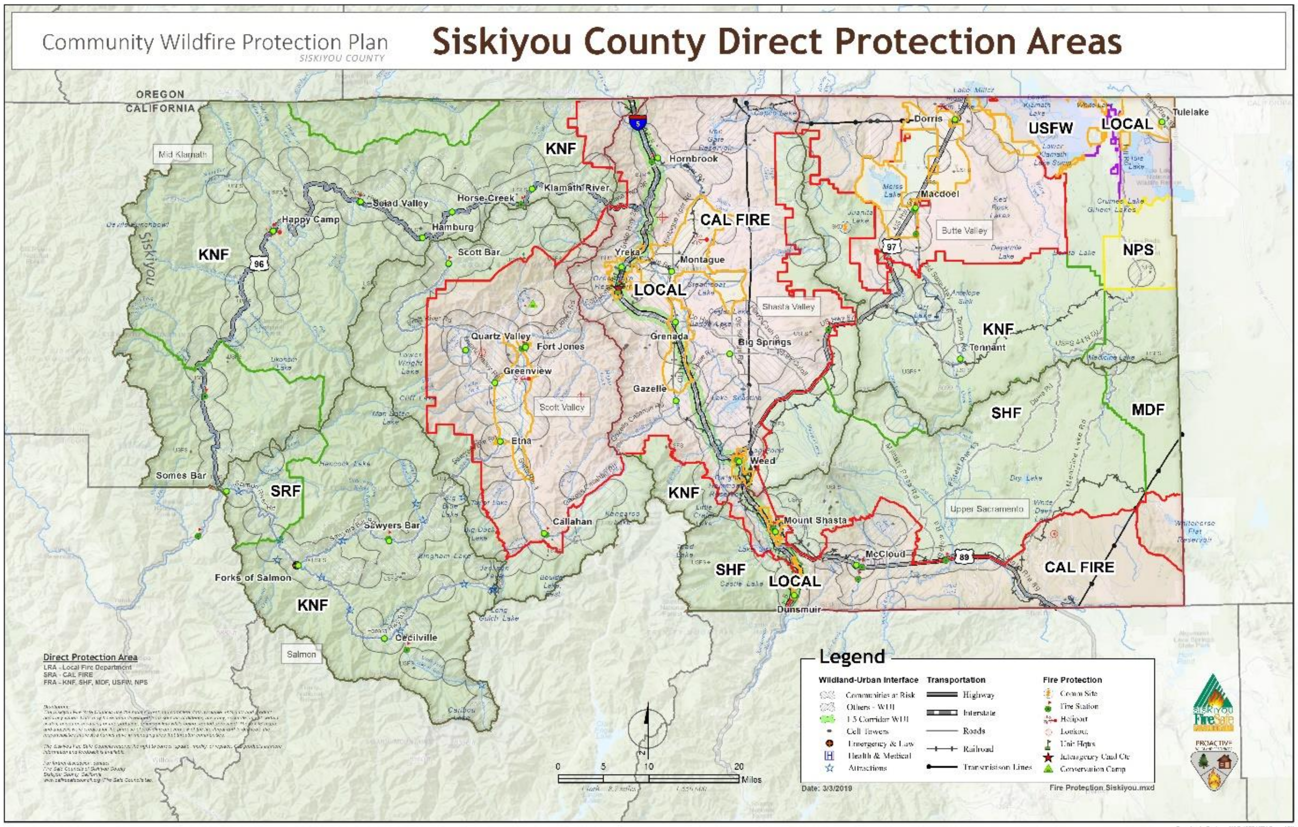
Siskiyou County's fire protection duties and responsibilities are fulfilled by combined forces at Federal, State and Local levels, each with a specific set of operating procedures within their responsibility area for pre-fire and fire suppression related activities. Personnel at each level provide the County with support for fire suppression, advanced life support, emergency medical services, technical rescue, and hazardous material response services.

2.3.1 Wildfire Direct Protection Areas (DPA)

As introduced briefly in Section 1.4.1, DPA's define California's intermingled and adjacent lands delineated by boundaries regardless of jurisdictional agency (see map below, Figure 7). Wildland fire protection responsibilities in these areas are negotiated, created and agreed to by the administrative units of either the Federal Agencies or the State. DPA does not equate a delegation of authority. Specific information about DPA and delegation of authority are addressed in the Annual Operating Plan (AOP) as defined in the CFMA.

Protection areas, as defined by boundaries, will be mapped and/or described and made a part of annual operating plans. The Federal Agencies and the State have agreed upon the DPAs in which each assumes the responsibility of maintaining protection systems. For more detail see *Part II. Planning Regions*.

Figure 7 – Federal, State, and Local Direct Protection Areas



All costs incurred to meet the protection responsibility within each agency's DPA will be the responsibility of that protecting agency. This fiscal responsibility includes special management considerations as identified in the AOP.

Every acre in California requires a responsible authority within the statewide DPA designation, including the designation of responsibility areas for entities not part of the CFMA. Wildland fire protection in the State of California is a legal responsibility of the state, local, or federal governments. The defined areas were previously summarized in Table 4 and are explained in more detail below. Agency resources at all levels are versed in their roles and follow Standard Operating Procedures (SOPs) per specific Mutual Aid and Auto Aid agreements and/or in the CFMA, thereby providing expedient emergency response protection to communities using the 'closest resource concept' (philosophy of committing the closest available appropriate resources, regardless of ownership).

- ***State Responsibility Areas (SRA) | Federal Responsibility Areas (FRA)***

  Recognizing that the protecting agency will represent the jurisdictional agency's interests in wildland fire protection consistent with State and Federal authority, CFMA participating agencies review protection responsibility in SRA and FRA within the DPA boundaries as part of the annual operating plan (AOP) development, review and update process. AOPs need to address wildland fire protection and structure defense consistent with what is provided by the CFMA.

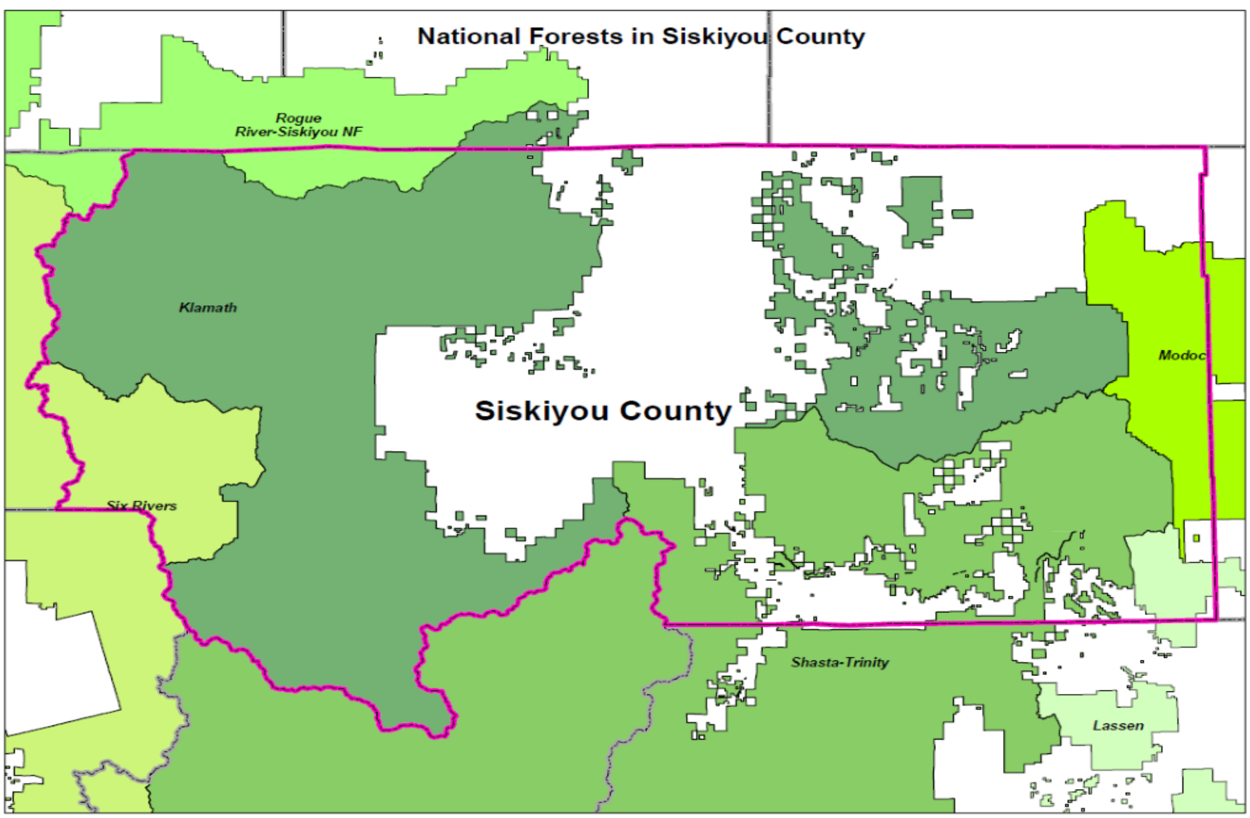
- ***Local Responsibility Areas (LRA)***

  Wildland fire protection responsibility for lands outside of SRA and FRA are not part of the CFMA. Although situations can exist where LRA is threatened or burned by wildland fire on SRA or FRA, the CFMA participating Agencies are not jurisdictionally or financially responsible for wildland or other fire protection on these lands; however, they do recognize that cost share agreements may document costs to local government agencies that are charged with protection of LRA (CFMA pp. 10-13).

2.3.2 Protection Area Suppression Resources

FEDERAL: Approximately sixty percent of the land base in Siskiyou County is under the jurisdiction of the USFS (Figure 8 – National Forests in Siskiyou County). There are five national forests that work cooperatively through interagency agreements to provide for fire protection responsibilities. Klamath National Forest (KNF) contains the largest acreage of forest lands in Siskiyou County, with Shasta-Trinity National Forest (SHF) next in acreage; these two forests provide the lead roles in wildfire suppression and pre-suppression activities. The Six Rivers National Forest (SRF) and Modoc National Forest (MDF) have much less presence due to a small land base, as is true with the Rogue-Siskiyou National Forest, based in Oregon. Each national forest has a similar hierarchy or "chain-of-command" for their fire suppression organization planning and operations (Table 5 – Federal / USFS Estimated Staffing Levels).

Figure 8 – National Forests in Siskiyou County



Source: KNF FMP – revised by J. Kessler

Table 5 – Federal / USFS (ESTIMATED 2018 STAFFING LEVELS)*

FEDERAL FIRE PROTECTION – 5 National Forests				
Klamath NF	Shasta Trinity NF	Modoc NF	Six Rivers NF	Rogue-Siskiyou NF
Forest Chief	Forest Chief	Forest Chief	Forest Chief	Forest Chief
HQ Staff: Asst Chief + Operations / Training / Fuels / Prevention / Planner / Dispatch Ctr (5 - 7)				
District Rangers (3)	District Ranger (1)	District Ranger (1)	District Ranger (1)	District Ranger (1)
Division Chief (5)	Division Chief (2)	Division Chief (1)	Division Chief (1)	Division Chief (1)
Battalion Chiefs (10)	Battalion Chief (3)	Battalion Chief (1)	Battalion Chief (1)	Battalion Chief (1)
Engines (12)	Engines (6)	Engine (1)	Engine (1)	Engine (1)
Prev/Patrols (15)	Prev/Patrols (3)	Patrol (1)	Patrol (1)	Patrol (1)
Water Tenders (4)	Water Tenders (1)			
Helicopters (2) T2, T3	Dozer (1)			
Hotshot Crews (2)	Lookout (1)			
Fire Use Module (3)				
Dozer (1)				
Lookouts (8)				

Forest Service and State resource fluctuation statement: *"The resource numbers for the agencies fluctuate due to many reasons in a given time. Primary examples include; high fire danger and increased staffing, winter month low fire danger and decreased staffing, temporary position vacancy".*

<u>STATE</u>: Approximately 32 percent of the County lands are under the CAL FIRE jurisdiction for fire protection. The Siskiyou Unit organization consists of four geographical Battalions and a California Department of Corrections and Rehabilitation Conservation (Fire) Camp, all providing suppression resources to the interagency forces across the County (see Table 6 – State / CAL FIRE Siskiyou Unit Organization). Each California county has a designated Fire Marshal or Warden representative assigned to fulfill duties including but not limited to enforcing structure fire-related policy, codes, inspections and other regulations that have been formally adopted by the State Fire Marshal for the prevention of fire or for the protection of life and property (Health and Safety Code, §13145 and 13146). Currently in Siskiyou County, the Siskiyou County Fire Warden representative is CAL FIRE Siskiyou Unit Chief, Phillip Anzo.

Table 6 – State / CAL FIRE Siskiyou Unit Organization (ESTIMATED 2019 SUMMER PREPAREDNESS STAFFING LEVELS)*

STATE FIRE PROTECTION – CAL FIRE			
Siskiyou Unit Chief (1)			
Staff – Div. Operations / BC Training / BC Prevention /Admin / Div. Deadwood Camp / BC Dispatch			
Battalion 1	Battalion 2	Battalion 3	Battalion 4
Battalion Chiefs (1)	Battalion Chiefs (1)	Battalion Chiefs (1)	Battalion Chiefs (1)
Engines T3 (2)	Engines T3 (4)	Engines T3 (3)	Engines T3 (4)
Defensible Space Inspectors (1)	Defensible Space Inspectors (1)	Defensible Space Inspectors (1)	Defensible Space Inspectors (1)
Dozer T2 (1)	Dozer T2 (1)		Fire Lookout (1)
Handcrews (4) T1	Fire Lookout (1)		
Fire Lookouts (2)			

***Forest Service and State resource fluctuation statement:** "The resource numbers for the agencies fluctuate due to many reasons in a given time. Primary examples include; high fire danger and increased staffing, winter month low fire danger and decreased staffing, position vacancy (temporary situation)".*

<u>LOCAL</u>: Local fire departments (Table 7) play a critical role in the emergency response system for each community, often arriving first on scene for fires and other emergencies. A large portion of these local departments across the County are staffed completely by volunteers. In many cases, the departments are located within a Fire Protection District (FPD) or Community Services District (CSD), typically governed by elected boards of directors and with authority to levy taxes to support their work. In most cases, each local fire station has one to three engines ready to respond on a daily basis. The protocol for local fire departments in CAL FIRE Siskiyou Unit is that CAL FIRE reciprocates emergency services using Mutual Aid and Automatic Aid Agreements.

Table 7 – Local Fire Departments*

LOCAL FIRE DEPARTMENTS – SISKIYOU COUNTY	
Butte Valley Fire Protection District	McCloud Community Services District
Castella Fire Protection District	Montague Fire Protection District
Copco Lake Fire Protection District	Mount Shasta City Fire Department
Dunsmuir City Fire Department	Mount Shasta Fire Protection District
Dorris City Fire Department	Mount Shasta Vista Fire Zone
Etna City Fire Department	Orleans – Somes Bar VFD
Fort Jones Fire Department	Pleasant Valley Fire Zone
Gazelle Fire Protection District	Salmon River Fire Company
Grenada Fire Protection District	Scott Valley Fire Protection District
Hammond Ranch Fire Zone	Seiad Valley Fire Company
Happy Camp Fire District	South Yreka Fire Protection District
Hilt/Colsten Fire Protection District	Tennant Community Services District
Hornbrook Fire Protection District	Tulelake Fire Department
Klamath River Fire company	Weed City Fire Department
Lake Shastina Community Services District	Yreka City Fire Department
Mayten Fire Protection District	

Source: CAL FIRE Siskiyou Unit Strategic Fire Plan.
*Resources fluctuate depending on number of volunteers and equipment availability.

NOTE

For specific fire station location and contact information see *Part II. Planning Regions.*

SECTION 3. DEFINING THE WILDFIRE SITUATION

Wildfire is inevitable and the probability of a catastrophic wildfire occurring at any particular location within or adjacent to a community of Siskiyou County is dependent on a chain of events that include fire ignition, fire weather, fire behavior, suppression actions taken, and the interaction of these factors. Each year firefighters from cooperating agencies combine efforts to contain most wildfires to less than ten acres. A rapid and aggressive fire suppression response from the air and ground, favorable weather and fuels conditions, timely fire reporting, and/or good access to wildfires by fire suppression resources all contribute to the success in suppressing these wildfires. However, when an ignition occurs under one or a combination of the following circumstances, then it has the potential to escape the best efforts of fire suppression resources:

- Critical fire weather and fuel conditions
- Area firefighting resources committed to fighting simultaneous wildfires elsewhere in California or the nation
- Limited or non-existent safe access for fire suppression resources into fire vicinity

When defining the wildfire situation from a scientific standpoint, key factors to consider are fire ecology, climate, and area fire history in conjunction with WUI proximity.

3.1 FIRE ECOLOGY

Fire ecology is a scientific discipline concerned with natural processes involving fire in an ecosystem. The study includes interrelationships between living organisms, their environments, and fire. The majority of Siskiyou County is encompassed in portions of two of California's nine major "bioregions": the Klamath Mountain Bioregion (western Siskiyou) and the Southern Cascade Bioregion (mid-eastern Siskiyou). There is also a small area in a third bioregion, Northeast Plateau (far eastern), sometimes referred to as Modoc bioregion. Since Siskiyou County is in only a portion of each bioregion, the term "ecoregion" is applicable for the following elements described in this fire ecology section.

The physical geography of a bioregion is foundational to the ecology of an area, largely affecting the other elements that comprise an ecosystem. Siskiyou County is extremely vast and diverse geographically and ecologically. These diverse conditions of land and vegetation are mirrored in the considerable range of wildfire behavior outputs.

TERMINOLOGY TIP

Bioregion (biological-geographical region): A major regional ecological community characterized by distinctive life forms and principal plant and animal species. There are 9 bioregions defined in California. (Fire in California's Ecosystems, 2006)

Ecoregion (ecological region): A large areas of similar climate where ecosystems recur in predictable patterns. (Rocky Mountain Research Station USDA Forest Service)

This section of the plan is a broad description of key ecological aspects correlated with the ecoregions, which shape and/or influence wildland fire and affect incumbent communities.

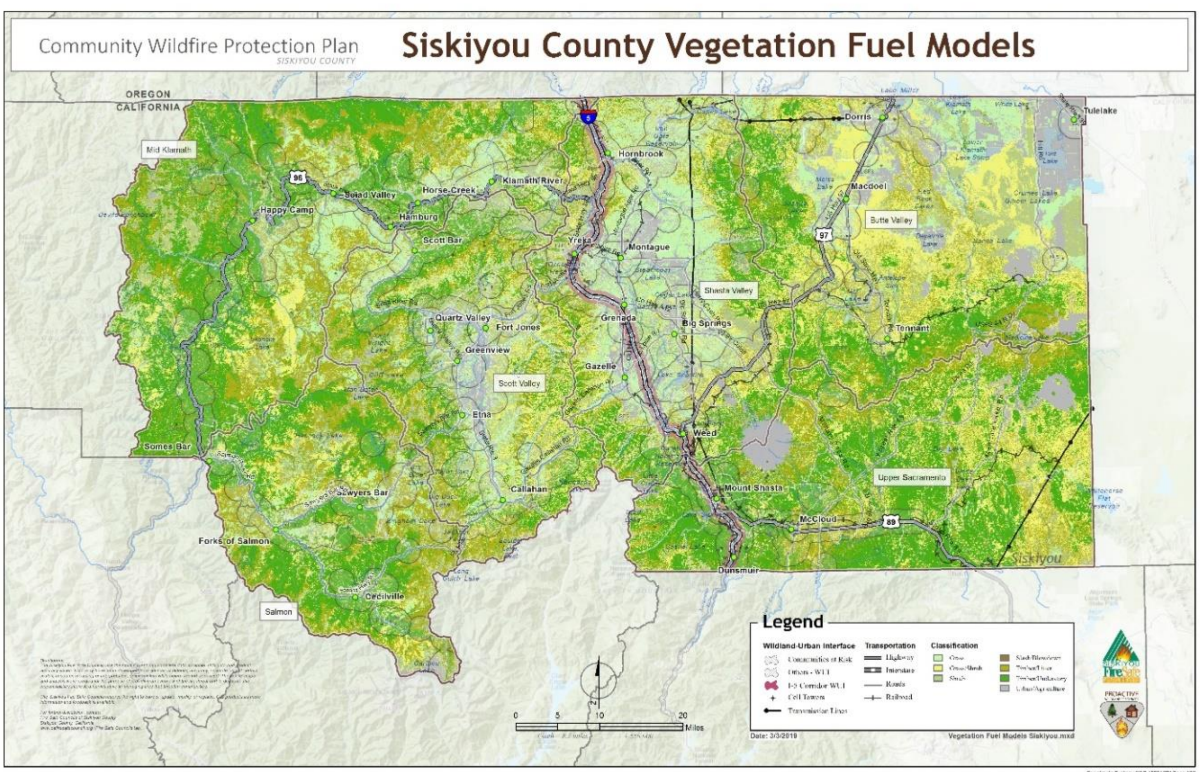
NOTE

Fire analysis information, including predicted fire behavior characteristics and estimated outputs for the six planning regions, are discussed in *Section 5 - Wildfire Assessment*; and further described in *Part II – Planning Regions*.

3.1.1 Vegetation

The ecoregion description of dominant vegetation types across the landscape is distinguished by elevational categories (i.e., valley floor, mid-montane, upper montane) and aspect/position of a slope (i.e., north, south, east, west). There are hundreds of vegetation species to account for in Siskiyou County. When conducting a landscape level wildfire analysis, vegetation is an essential and foundational factor for fire behavior. Vegetation species of an area are often combined into broad ecological categories and termed "vegetation types" (veg-types). This information is coarsely mapped in state and national level databases. A broad vegetation-type map overview with estimated coverage percentages for the County is depicted in Figure 9. More detailed information showing the most common vegetation types are documented in Tables 8a-c. Fire science researchers have determined expected fire behavior characteristics for each veg-type leading to the development of fire behavior "fuel models" (see *Section 3.4.1.1* for additional details). Following are general descriptions of these broad vegetation categories for the Southern Cascade, Klamath Mountain and Northeastern Plateau bioregions.

Figure 9 – Vegetation/Fuel Model Map - Siskiyou County



Conifer Forests:

Mixed Conifer forest
Courtesy of Klamathtribes.org

Conifer forests dominate the mid-montane zone in each ecoregion. These conifer stands are often intermixed with woodlands and shrublands. The mid-montane zone of the Southern Cascades is quite different on the east versus west side of the mountain range because of the rain shadow effect (affecting precipitation amounts) and differences in temperature. Stand composition is directly influenced by elevation, slope aspect, soil moisture conditions and substrate (Griffin 1967). Montane conifer forests in the north central Klamath Mountains can be quite diverse with some watersheds supporting up to 17 conifer species (Keeler-Wolf, 1990). Northeastern Plateau landscapes are a mixture of vast arid basins and uplands, forested mountain ranges interspersed with both fresh water and alkaline wetlands. This ecoregion is significantly influenced by the rain shadow effect of the Cascade Range to the West (see Table 8a for commonly occurring Conifers).

Conifer response to fire: Most of the more common conifer species, including ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), incense cedar (*Calocedrus decurrens*), sugar pine (*Pinus lambertiana*), Jeffrey pine (*Pinus jeffreyi*), and white fir (*Abies concolor*), survive frequent surface fires of low–moderate intensity when mature. The primary difference is how early in life they become resistant to these fires. In the eastside areas, Western juniper (*Juniperus occidentalis*) is more easily killed by fires that other conifers would survive and it invades open sites from rocky refugia during longer fire-free periods. Three conifers - knobcone pine (*Pinus attenuata*), Macnab cypress (*Hesperocyparis macnabiana*), and Baker cypress (*H. bakeri*) - have serotinous cones (Rentz and Merriam,2011; Milich et al., 2012), meaning they rely on occasional severe crown fires to induce regeneration. Tree species in the subalpine zone generally have thinner bark than species of lower elevations and are easily damaged or killed by moderate-intensity fire and/or a fire's sustained heat during consumption of heavy surface fuels at the base of the tree.

Deciduous Hardwoods:

In the lower montane zone and alluvial valley areas, oak woodland stands often overtop a grass-shrub understory. The mid-montane zone may consist of a subcanopy of deciduous hardwoods beneath or intermingled with a mixed conifer overstory. Stand composition is influenced by elevation, slope aspect, soil moisture conditions, substrate (Griffin, 1967) and fire history (see Table 8b for commonly occurring Hardwood species)

South Fork, Upper Sacramento River
Courtesy of J.Titus

Hardwood response to fire:
Most of the common deciduous hardwoods, including California black oak (*Quercus kelloggii*), big-leaf maple (*Acer macrophyllum*), Pacific dogwood (*Cornus nuttallii*), and the evergreen canyon live oak (*Quercus chrysolepis*), are able to survive low-intensity surface fires and they sprout vigorously

when top-killed. Canyon live oak and California black oak, common in the lower montane zone of the Klamath Mountains, are considered sensitive to moderate-high intensity fire. These oaks are easily top-killed due to dense canopy and thin bark, and are susceptible to crown scorch and cambium damage. Oak litter beds decompose rapidly contributing to low accumulations of fuel so fires that burn in oak litter are low intensity compared to fires in pine litter and rarely damage mature stems. California black oak crowns are generally open and rarely support crown fires. As with most oaks, if the top is killed, they will resprout vigorously from the root crown (Tollefson, 2008). Under typical weather conditions, fire severity is often lower in oak woodlands. While some tree species can recover by sprouting, years are required to restore the pre-fire woodland canopy cover.

Shrub/Montane Chaparral:

Forest cover is often interrupted by stands of montane chaparral. Shrub species dominance varies with substrate, soils, and other conditions (see Table 8c for commonly occurring Shrub species). The lower and mid-montane zone is characterized by a very complex and diverse intermixing of vegetation. This heterogeneity is caused by rugged complex terrain, diverse lithology, and a diversity of fire regimes. Many of the species are adapted for seasonal and larger episodic droughts with characteristics such as small evergreen resin and/or waxy leaves, leaves that roll when dry, leaves or needles with fine hairs, and leaves that drop in the summer months.

Fire Regime

Description of the patterns of fire occurrences, frequency, size, severity, and sometimes vegetation and fire effects as well, in a given area or ecosystem.

NWCG Glossary, 2018

Dense stands of shrubs dominated by Brewer oak (*Quercus garryana* var. *breweri*), also known as Oregon white oak, are common and often support a diverse association of woody species. Brewer oak stands are found well into the mid-montane areas. Often, montane chaparral occupy sites unable to support trees due to shallow soils or to exposed slopes where cold, high winds, ice damage, and a history of severe fires are common (Beaty and Taylor 2001; Lauvaux et al. 2016). Once established, because of the nature of shrub fuels, fires that burn in these communities are more likely to be high-intensity events. Thus, where shrub communities become established, recurring fire plays a key role in the maintenance of these communities by inhibiting succession from shrubs to trees (Nagel and Taylor 2005; Lauvaux et al. 2016).

MacDoel-Tennant Area
Courtesy of Realty.com

In the far northeast section of the County (Northeast Plateau/Modoc ecoregion), dominant lower elevation shrub species may include sagebrush (*Artemesia spp.*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*) often interspersed amongst junipers. In the lower montane areas, many yellow pine dominated forests and woodlands today have a relatively continuous understory of bitterbrush (*Purshia tridentata*) such as those surrounding Butte Valley.

Chaparral species are adapted to regenerate after a fire through various means of post fire reproduction, such as:

- Obligate seeders – mature plants are killed by fire and populations regenerate from seedlings that germinate the following winter or spring.
- Sprouters – shrubs that are top-killed by fire but re-sprout vigorously from root crown or burl.
- Combination seeders and sprouters – regenerate from seedlings and re-sprout from root crowns or burls.
- Fire followers – annual and perennial herbaceous species dominate an area during the first year or two after a fire but decline within 2 – 5 years as shrub cover increases. They drop seeds that lay in wait to the next wildfire event to regenerate.

<u>Shrub/Chaparral response to fire:</u>
In the Klamath Mountain and Southern Cascades ecoregions, with few exceptions, the more common shrubs such as greenleaf manzanita (*Arctostaphylos patula*), California-lilac or deer brush (*Ceanothus integerrimus*) , and shrub-like oaks sprout vigorously after being top-killed following fire. Moreover, manzanita and most Ceanothus species also reestablish after fire from long-lived seeds stored in soil seed banks (Knapp et al. 2012). An exception is whiteleaf manzanita (*Arctostaphylos viscida*), which is easily top-killed by even low-intensity fires and relies on soil seed banks to germinate following fires. Brewer's oak is generally more flammable than other shrub oaks and other shrub associates. The leaf morphology creates a less compact more flammable litter bed than its associates (Engber and Varner 2012). Thus, where Brewer's oak is a major component of shrub fields, it is usually the primary carrier of fire.

The lower-mid montane area of the Northeast plateau/Modoc ecoregion is often characterized by widespread bitterbrush in the understory associated with Jeffrey and ponderosa pine forests. Bitterbrush in this ecoregion is fire sensitive and easily killed by even low-intensity fires. It does not sprout well unless young and vigorous. When mature and robust it is highly flammable, burns with high intensity, and plants are usually killed outright.

<u>Grasses/Forbs</u>:

Scott Valley Area
Courtesy of LandsOfAmerica.com

Species composition varies from west to east with few natural meadows or grasslands occurring on the west side of the range. In the western Klamath Mountains are areas on upper slopes and ridge tops locally known as prairies supporting dense perennial grasses. Grasslands do occur on shallow ultra-mafic soils and on cemented glacial till, while (small) wet montane meadows are scattered throughout the upper montane and subalpine areas.

Lower elevations on both sides of the Cascades are dominated by grasslands, shrublands, and woodlands. The Northwestern foothills north of Mount Shasta, including the Shasta Valley and adjacent foothills, are in the rain shadow of the Klamath Mountains, and sustain vegetation alliances that include grasses. Another extensive grassland area occurs in the unique alluvial formation of Scott Valley area.

On the eastside, widespread cheatgrass (*Bromus tectorum*) invasion has promoted more frequent fire return intervals in the sagebrush steppe, converting much of the Sagebrush Steppe Zone to annual grasslands. Due to its early-season growth, cheat grass can outcompete native grasses, forbs, and shrubs by reducing moisture and nutrients in surface soils (Norton et al. 2004). Annual grasses and forbs such as cheat grass, medusa head (*Elymus caput-medusae*), tumble mustard (*Sisymbrium altissimum*), and the native tansy mustard (*Descurainia pinnata*) have successfully invaded and resulted in a shift of shrub steppe communities throughout the region to annual grasslands. Thousands of hectares of sagebrush, bitter-brush, and curl-leaf mountain-mahogany plant communities in the region have been converted to low diversity annual grasslands.

<u>Grass/Forbs response to fire:</u>

Once established, cheat grass alters fire regimes by creating continuous fine fuels that promote frequent, high-severity fires (Zouhar 2003). Successive short-interval fires can lead to extensive loss of shrub cover and dominance by cheat grass. In the eastside environment, the intermediate elevations represent transition zones where fire effects have been largely beneficial, but this exotic cover expansion is an increasing concern.

NOTE

Common grass species are not included in the tables below due to the extensive number of listings. When discussing grasses in fire ecology, structure (height, density and continuity) and moisture content/seasonality (dry or green) are more germane than species type.

Table 8a – Commonly Occurring Conifers for the Southern Cascades, Klamath Mountains and Northeastern Plateau Bioregions

Common Conifer Species: Siskiyou County Area Bioregions				
Zone	**Slope**	**Southern Cascades**	**Klamath Mountains**	**Northeastern Plateau**
Lower Montane	West	Ponderosa pine Grey pine	Douglas fir Ponderosa pine Grey pine Knobcone pine	Western juniper Ponderosa pine (Jeffrey pine) Incense cedar
	East	Grey pine Ponderosa pine Western juniper		
Mid Montane	West	Ponderosa pine Douglas Fir Incense cedar] Sugar pine Jeffrey pine White fir Western juniper Knobcone pine Modoc	Knobcone pine Ponderosa Jeffery pine Incense cedar Port Orford cedar Sugar pine Western white pine Shasta red fir White fir Western juniper Brewer's spruce Lodgepole pine	Ponderosa pine Jeffery pine White fir Incense cedar
	East	Ponderosa pine Jeffrey pine White fire Incense cedar Knobcone pine MacNab cypress Modoc cypress		
Upper Montane	West/ East	White fir Shasta red fir Lodgepole pine Western white pine	Mountain hemlock Shasta red fir Whitebark pine Western white pine Foxtail pine	White fir Ponderosa pine Jeffrey pine Western white pine Lodgepole pine

Table 8b – Commonly Occurring Deciduous Hardwoods for the Southern Cascades, Klamath Mountains and Northeastern Plateau Bioregions

Common Deciduous Hardwood Species: Siskiyou County Area Bioregions				
Zone	**Slope**	**Southern Cascades**	**Klamath Mountains**	**Northeastern Plateau**
Lower Montane	West to East	California black oak Interior live oak	Blue oak Oregon oak	California black oak Oregon oak
		Blue oak	Tanoak	
		California bay	Foothill ash Oregon ash Fremont cottonwood	
			White alder	
Mid Montane	West to East	California black oak	[NOTE: Mid-to-Upper Montane]	NOTE: Rarely occur
		Big leaf maple Oregon oak Mountain dogwood Canyon live oak White alder Oregon ash Quaking aspen	Big leaf maple Tanoak Canyon live oak Pacific dogwood Oregon oak White alder Oregon ash	
			Western birch	
Upper Montane	West To East	Quaking aspen Willow Black cottonwood		Quaking aspen

Table 8c – Commonly Occurring Shrubs /Montane Chaparral for the Southern Cascades, Klamath Mountains and Northeastern Plateau Bioregions

Common Shrub Species: Siskiyou County Area Bioregions					
Zone	**Slope**	**Southern Cascades**	**Klamath Mountains**		**Northeastern Plateau**
Lower Montane	West to East	Buckbrush	Whiteleaf manzanita	Shrub tan oak	Mahala mat
		Whiteleaf manzanita	Chamise	Birch-leaf mtn mahogany	Greenleaf manzanita
		Common manzanita	Deer brush	Wild mock orange	Western choke-cherry
			Greenleaf manzanita	California storax	Utah service berry
			Mahala mat	Poison oak	Bitter cherry
			California buckeye		Modoc plum
			Lemmon's ceanothus		Bitterbrush
Mid Montane	West to East	Greenleaf manzanita	[NOTE: Mid-to-Upper Montane]		Mountain big sagebrush
		Curl-leaf mountain-mahogany	Tobacco brush		Mahala mat
		Deer brush	Greenleaf manzanita		Greenleaf manzanita
		Tobacco brush	Mahala mat		Snowbrush ceanothus
		Mahala mat	Bush chinquapin		Mountain snowberry
		Buckbrush	Shrub tanoak		Creeping barberry
		Birch-leaf mountain mahogany	Huckleberry oak		Mountain big sagebrush
		Shrub tanoak	California buckeye		
		Bush chinquapin	Wild mock orange		
		Bitterbrush	Vine maple		
		Mountain misery	Mountain maple		

Upper Montane	West to East	Greenleaf manzanita		Bush chinquapin
		Tobacco brush		Creeping snowberry
		Bush chinquapin		Mountain snowberry
		Mountain whitethorn		Sticky currant
		Huckleberry oak		Snowfield sagebrush
		Rubber rabbitbrush		Pinemat manzanita
		Big sagebrush		Mountain big sagebrush

3.2 CLIMATE

As demonstrated by the Köppen-Geiger Climate Classification System (http://koeppen-geiger.vu-wien.ac.at/index.htm), Siskiyou County spans two climate classifications: Csb ("Warm temperate | Dry Summer | Warm Summer") and Csa ("Warm temperate | Dry Summer | Hot Summer"). Both categories are commonly referred to as Mediterranean climate and characterized by the typical precipitation pattern of dry and warm summer months with moisture occurring in the late winter and spring.

In both the Klamath Mountain and Southern Cascade ecoregions, the local expression of climate is remarkably variable, largely due to the strong west to east gradient in precipitation and temperature which creates very different environments at similar elevations. Generally, increasing elevation results in decreased temperatures and increased annual precipitation, with most precipitation falling as snow in higher elevations. The driest areas are Butte and Shasta Valleys located north of Mount Shasta and in the rain shadow of the Klamath range. Critical fire weather occurs with frontal passages and associated high wind / low humidity scenarios. In the Northeastern Plateau portion of the County, the climate is buffered from Pacific storms by being in the rain shadow of the Cascade Range. Most of the precipitation occurs between October and May, with the majority coming between November and April as snow. Summer thunderstorms can be locally significant and are the source of lightning-ignited fires; they also account for 12-19% of total annual precipitation (Fire in CA Ecosystems, 2018).

3.2.1 Weather Systems and Fire

Three types of fire weather conditions that occur during fire season are important in the southern Cascades and Klamath Mountains (Hull et al. 1966): (1) Pacific High—Postfrontal (Postfrontal); (2) Pacific High—Prefrontal (Prefrontal); and (3) Subtropical High Aloft (Subtropical High).

- Postfrontal conditions occur when high pressure follows the passage of a cold front and causes strong winds from the north and northeast (termed "foehn winds") on the east side of the Klamath range. Temperatures rise and humidity decreases under these conditions.

- A Prefrontal scenario occurs when the southern, dry tail of a cold front crosses the area and generates strong southwest or west winds. Winds are the key fire weather factor in this condition, offsetting dropping temperatures and higher humidity.
- Subtropical High conditions occur when the region is under the influence of high pressure that causes temperatures to rise and humidity to drop. In the Klamath Mountains ecoregion, these conditions lead to fires influenced mostly by local topography and largely affected by development of strong temperature inversions. In the southern Cascades this condition is often accompanied by periods of high atmospheric instability (Schroeder and Buck 1970) with high values of the Haines Index (atmospheric stability-instability), which are associated with widespread burning.

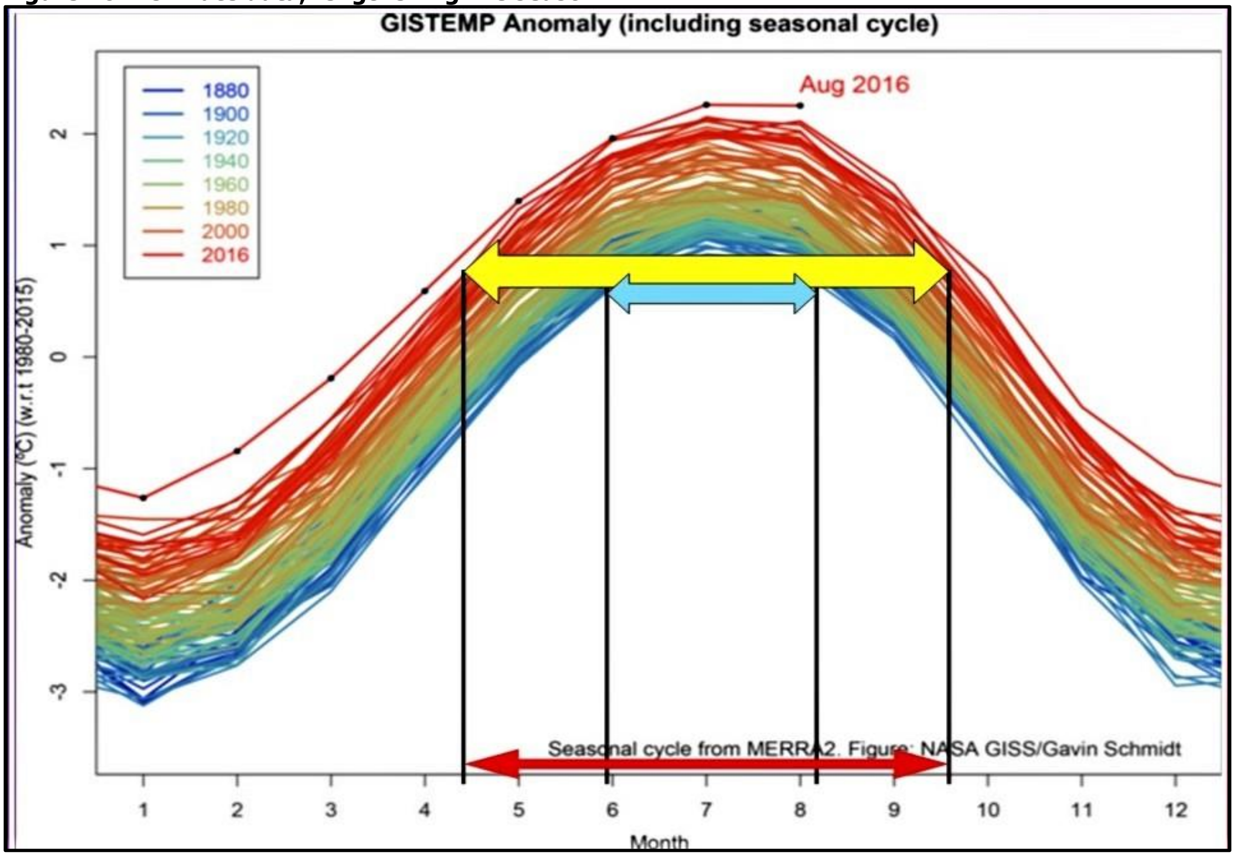
In the Northeastern Plateau ecoregion, there are three primary fire weather patterns that can significantly affect fire behavior and natural ignitions during the fire season: (1) Pre-frontal Winds, (2) Lightning with Low Precipitation, and (3) Strong Subsidence/Low Relative Humidity patterns. A fourth pattern, Moist Monsoon, is very rare in northeastern California, but can produce widespread thunderstorms. The Pre-frontal Winds and Strong Subsidence/Low Relative Humidity patterns mostly affect fire behavior and spread, while the Lightning with Low Precipitation and Moist Monsoon patterns are important for their potential to ignite many simultaneous widespread fires (Skinner et. al., 2018).

3.2.2 Climate Change

Climate change has affected California for decades with observations including increases in average temperatures, more hot days, fewer cold nights, a lengthening of the growing season, less winter precipitation falling as snow, snowmelt and rainwater running off sooner in the year, and longer periods of drought. As a result, fire seasons are prolonged and continue to increase stress on the state's infrastructure, water supplies, and natural resources (California Fire Plan, 2010).

The increasing number of large fires combined with the increasing proportion of high-severity burn is occurring during a period of rapid global climatic change. This trend, combined with a warming climate and longer fire seasons, may serve as a catalyst to more permanent shifts in vegetation from forests to shrublands (Collins and Skinner, 2014; Lauvaux et al., 2016). Human actions such as fire suppression and growing WUI areas, combined with the shift in climate, have further altered historic fire regimes. Changes to fire regimes have caused changes in plant community composition and structure and wildlife habitat in many plant communities (Figure 10).

Figure 10 – Climate data; lengthening fire season



Source: Carl Skinner (Ret.) USFS Pacific Southwest Research Station

3.2.3 Drought

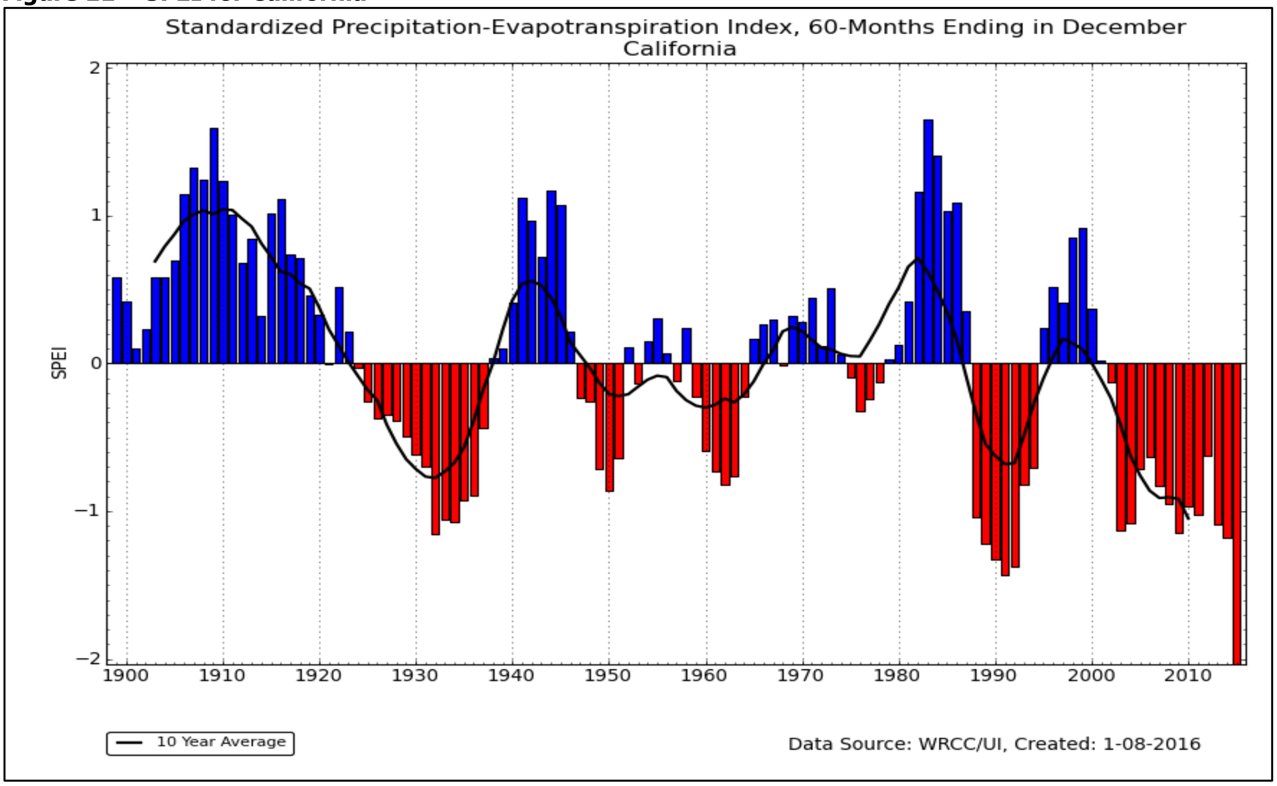
The most recent drought period in California (approximately 2011-2016) was one of the worst in the past century with significant impacts including fierce wildfires, water shortages and restrictions, and staggering agricultural losses. The dryness in California is only part of a longer-term, 15-year drought trend across most of the Western United States, one that bioclimatologist Park Williams said is notable because "more area in the West has persistently been in drought during the past 15 years than in any other 15-year period ***since the 1150s and 1160s***" (Doyle Rice, USA Today Sept 2014).

2018 displayed similar drought-related fire behavior with two megafires: the Carr fire that ravished the western Redding suburbs, burning 229,651 acres, and the Mendocino Complex which burned 459,123 acres, becoming the largest fire in the State's history. Both wildfires exhibited extraordinary fire behavior through large areas of the WUI, leaving behind a disastrous path resulting in unprecedented loss of life, property and critical infrastructure.

The National Oceanic Atmospheric Administration (NOAA) publishes two key water supply indices relevant to understanding the impact of drought on fire behavior (see Figure 11). The SPI (Standard Precipitation Index) measures water supply, while the SPEI (Standardized Precipitation Evapotranspiration Index) measures the combination of water supply (precipitation) and water demand (evapotranspiration as computed from temperature). Warmer temperatures tend to increase evapotranspiration, which generally intensifies droughts.

This is especially true in California, where the past two decades ranked as the warmest and second warmest such periods in the 1895-2015 record, with both decades much warmer than all of the years before them. The last decade in particular has been much warmer than average. The persistent dryness in California during the last decade has also resulted in the driest recorded SPI for the most recent 36 and 60 month tracking periods (NOAA-drought 2015). Although the precipitation amounts since 2015 have improved, the effects of this drought persist as depicted in resultant stress and mortality in wildland vegetation (see *Section 3.2.4*).

Figure 11 – SPEI for California



3.2.4 Tree Mortality

When forest density is high under drought conditions, competition for water and nutrients is amplified. Trees in this weakened state are less effective at defending themselves from bark beetles and other pests. Each successful onslaught from the beetles brings forth a new brood of thousands more, further compounding the problem. As the number of host trees dwindle and precipitation returns, conditions become less favorable for the beetles and balance in the forest is restored.

In recent decades, billions of conifers have been killed by bark beetles in forests ranging from Alaska to Mexico, and several outbreaks are regarded as the largest and most severe in recorded history. For each of these records, we see a trigger that can be linked to climate change, whether expressed directly through the bark beetle species (e.g., increases in temperature that increase the number of generations produced) or indirectly through the host (e.g., the drought's effect on ponderosa pine in the central and southern Sierra Nevada). (USDA Pacific Southwest Research Station, USDA Forest Service, March 2018).

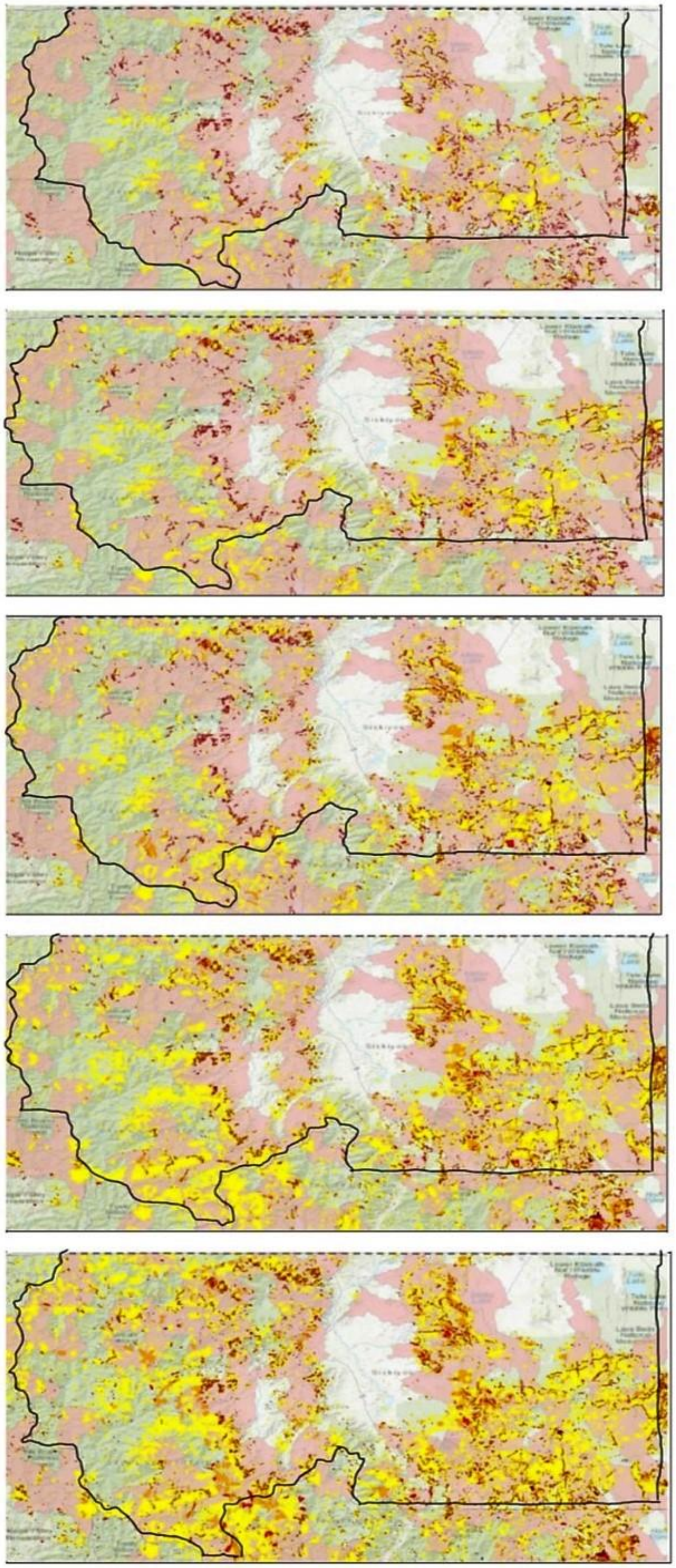
Overgrown forests, years of drought and bark beetles have created a situation where millions of trees throughout California are dead or dying. An estimated 129 million trees since 2010 have died from bark beetle infestation, and more die each day. In 2016 alone, 62 million trees died, representing more than a 100 percent increase in tree mortality across the state compared to levels observed in 2015. Millions of additional trees are weakened and expected to die in the coming months and years (Pacific Southwest Research Station, USFS Forest Service, March 2018).

Conifer Mortality
Courtesy of Siskiyou County, Tree Mortality Task Force

As of April 2017, 850,000 acres throughout Siskiyou County have been identified as having some degree of tree mortality, with over 76,000 acres designated as having high to extreme tree mortality. In 2015, Governor Jerry Brown issued a Proclamation of A State of Emergency for tree mortality issues throughout California; and in September 2016, the Siskiyou County Board of Supervisors adopted a resolution to form a Tree Mortality Task Force to address tree mortality issues throughout the County, and provide outreach, education, and opportunities for private landowners who may have tree mortality on their private property. The current structure of the task force is made up of Siskiyou County Natural Resources, the Office of Emergency Services, the U.S. Forest Service, and CAL FIRE (County of Siskiyou CA website, 2017). See *Section 6. Action Plan* for further information.

A comparative chart of the Siskiyou County area showing the progression of tree mortality from 2012-2017 is depicted in Figure 12. This image was developed from an interagency supported statewide database (CAL FIRE FRAP database, 2017).

Figure 12 – Tree Mortality



Siskiyou County
Tree Mortality Progression
2012 – 2017

LEGEND

Tree Mortality (Dead Trees Per Acre)

- >0 - 5 (Background Mortality)
- 5 - 15
- 15 - 40
- 40+

County Boundaries

Tier One High Hazard Zones

Tier Two High Hazard Zones

DEFINITIONS:

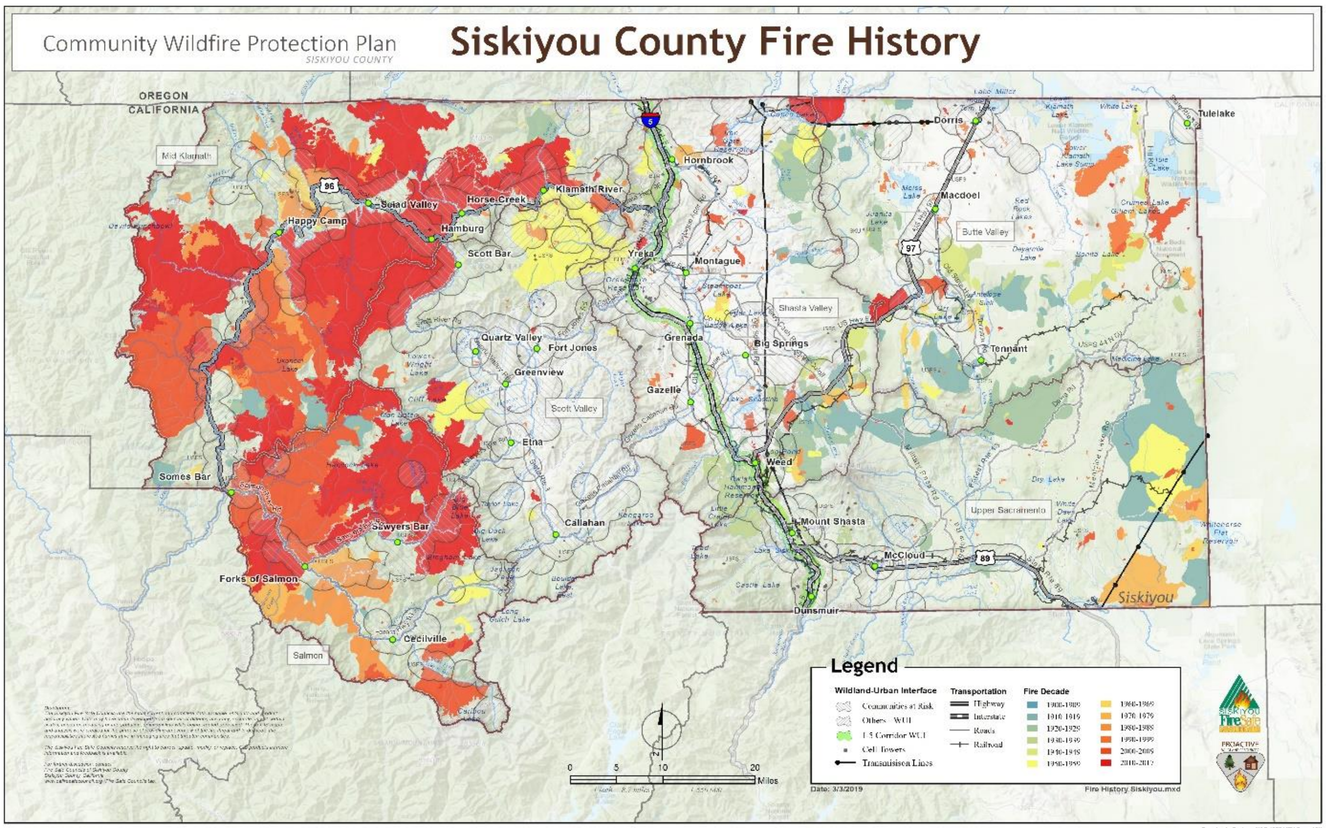
Tier One High Hazard Zones:
Tree mortality in direct proximity to assets determined to be important to life and property. They represent a direct threat to public safety from falling trees.

Tier Two High Hazard Zones:
Defined by watersheds (HUC 12, average 24,000 acres) that have elevated tree mortality as well as significant community and natural resource assets.

3.3 AREA FIRE HISTORY

This history of fire in Siskiyou County is best summarized as follows: "The history of fire in America also is the history of humans on this continent. Humans have been here for more than 12,000 years and everywhere we see humans move, we see fires follow. Understanding this history is important for managing and improving the ecology of forests in the future" (Michael Stambaugh, 2016). Figure 13 depicts a graphic representation of Siskiyou County's fire history. Current trends of increasing fire size and intensity emphasize the importance of considering the past while moving forward on coordinated strategic planning.

Figure 13 – County Fire history



Note: Depicted are large fires including those equal to or greater than 100 acres.

3.3.1 Historic

Several fire history studies describe fire regimes of the Klamath Mountains over the last few centuries (Agee 1991; Wills and Stuart 1994; Taylor and Skinner 1998, 2003; Stuart and Salazar 2000; Skinner 2003a, 2003b; Fry and Stephens 2006). These studies indicate there are two periods with distinctly different fire regimes: (1) the Native American period, which usually includes both the prehistoric and European settlement periods, and (2) the fire-suppression period. Ignitions by natives appear to have been widespread, but the extent of their influence on fire regimes and vegetation is not known. Though there is variation amongst the studies as to when fire suppression became effective, it is clear that before fire suppression began most western forests experienced at least several fires each century. This suggests a general fire regime of frequent, low-to-moderate intensity fires.

Areas of the Southern Cascades ecoregion began to experience a decrease in fire occurrence as early as the late nineteenth century (Norman and Taylor 2005; Gill and Taylor 2009; Taylor 2010). The decrease was pronounced near meadows, coinciding well with a documented period of heavy sheep grazing on the east side of the range (Taylor 1990a; Norman and Taylor 2005). Most areas did not experience a fire frequency decline until the beginning of organized fire suppression. Even then, rural residents would often continue burning to maintain forage for livestock. The earliest accounts of wildland fire suppression are from 1887 for fires burning along the railroad lines near what is now the city of Mount Shasta (Morford 1984). The first recorded organized fire protection in wildland areas was by the Central Pacific Railroad in 1898 which supported mounted patrols to suppress fires in the McCloud flats east of Mount Shasta (Morford 1984).

3.3.2 Twentieth Century

Fire occurrence declined dramatically with the onset of fire suppression. Over the 400 years preceding effective fire suppression, there are no comparable fire-free periods when large landscapes experienced decades without fires simultaneously across the Klamath Mountain ecoregion (Skinner, 2003; Fry, Stephens et al. 2006).

These changes in the fire regimes are accompanied by changes in landscape vegetation patterns. Before fire suppression, fires of higher spatial complexity created openings of variable size within a matrix of forest that was generally more open than today (Taylor and Skinner 1998). This heterogeneous pattern has been replaced by a more homogenous pattern of smaller openings in a matrix of denser forests (Skinner 1995a). The annual maximum fire size and total area burned have been increasing since the onset of fire suppression in the early twentieth century, even as number of fires has declined (Miller et al. 2012a).

The size of fires and the size of high-severity burn patches have been increasing over the last several decades. The larger the fire, the larger the maximum high-severity burn patches (Miller et al. 2012a). The extent of recent high-severity burn patches appears to exceed historic patch size patterns (Skinner 1995a, Taylor and Skinner 1998). Suggestions are that this feature is related, in part, to higher quantities and more continuous, homogeneous fuels caused by accumulation during the fire-suppression period.

3.3.3 Twenty-first Century

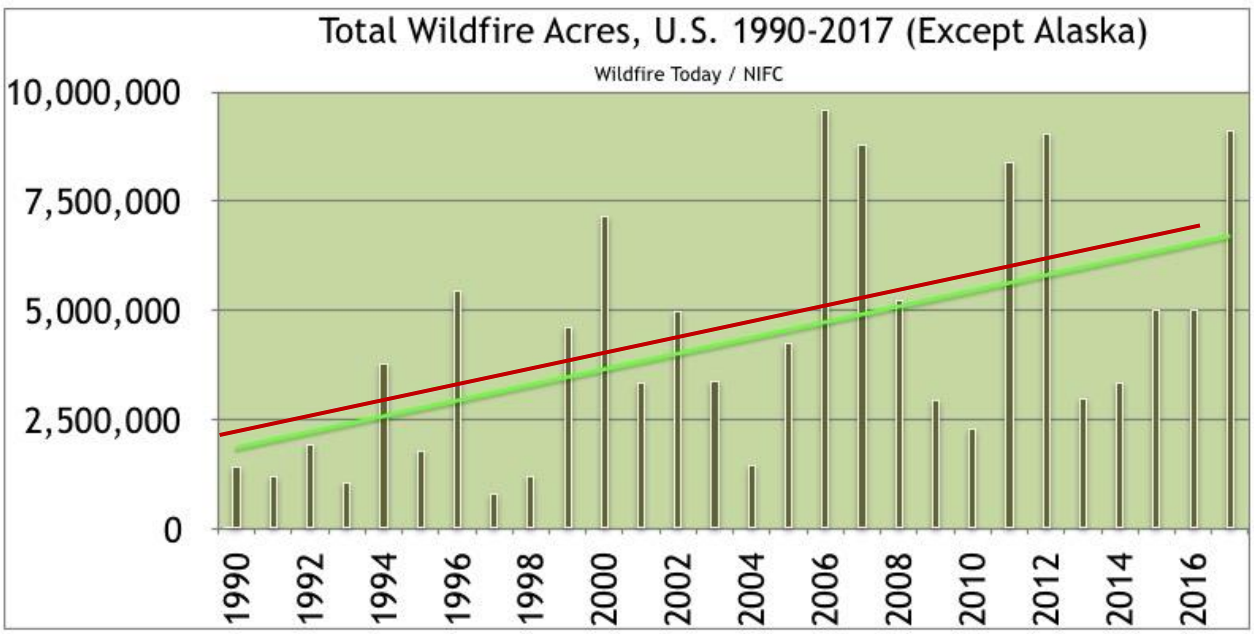
In the early 21st century, fires have been bigger, more communities have burned, and firefighters have continued to die. This situation was and is truly a crisis and has led to the coinage of the term megafire for fires in excess of 100,000 acres (Pyne, 2017). The increasing number of large fires combined with the increasing proportion of high-severity burn is occurring during a period of rapid global climatic change. This trend, combined with a warming climate and longer fire seasons, may serve as a catalyst to more permanent shifts in vegetation from forests to shrublands (Collins, Skinner 2014; Lauvaux et al., 2016).

The WUI has received increased attention during this period as severe wildfires have repeatedly exceeded suppression resource capabilities with devastating results and posing crisis situations in communities. There has been an enormous expansion of disciplines within and related to fire research with an explosion of relevant publications. Some experts have observed that the additional research does not seem to be abating the challenges presented by fire (Pyne 2017).

Figure 14 depicts the rapid trend of increasing wildfire size over the last 30 years. The number of acres burned in the United States in 2017 came close to breaking a record. The wildfire acres burned in the 50 states was 10,026,086 and was the second highest since reliable records have been kept (2015 about 100,000 acres more). That is 49 percent higher than the average over the last 10 years. (National Interagency Fire Center, accessed 2019.)

2018 displayed similar drought-related fire behavior with two megafires: the Carr fire that ravished the western Redding suburbs, burning 229,651 acres, and the Mendocino Complex which burned 459,123 acres, becoming the largest fire in the State's history. Following this barrage of summer destruction, the late fall ignition on November 10th in Butte County near the town of Paradise sparked the most destructive wildfire in the State's history. These wildfires exhibited extraordinary fire behavior through large areas of the WUI, leaving behind a disastrous path resulting in unprecedented loss of life, property and critical infrastructure.

Figure 14 – Wildfire size trend

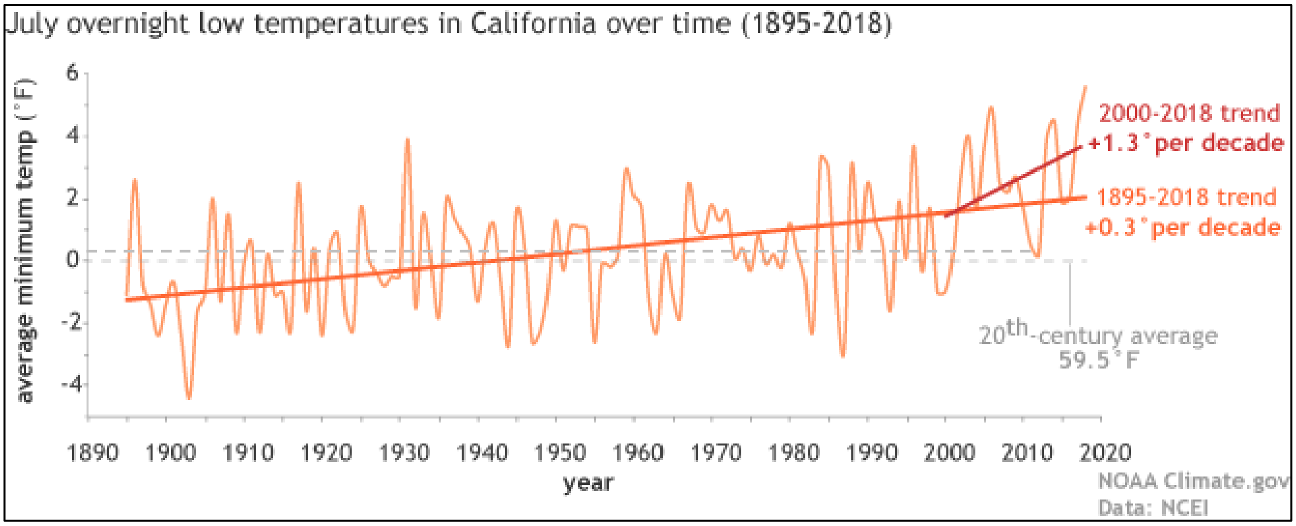


Source: Wildfire Today, Bill Gabbert, January 2018

An interesting fact contributing to increased wildfire size is that daytime high temperatures were well above average across much of the western United States in July 2017, but it was overnight low temperatures that were really extreme in large areas of California and areas of the western US—where firefighters were battling multiple wildfires.

Figure 15 depicts average July minimum temperatures (overnight lows) in California (light orange line) from 1895–2018. The trend over the historical record is shown in dark orange, and the recent trend (2000-2018) is shown in red. The twentieth-century average is shown with a gray dotted line.

Figure 15 – California overnight low temperatures in July



Source: NOAA Climate.gov graph, based on data from NCEI's Climate at a Glance.

According to Tim Brown, director of NOAA's Western Region Climate Center (WRCC), this pattern has serious consequences for wildfires and those who combat them. When temperatures cool off overnight, it's not just a physical relief for firefighters who may be working in conditions that push the limits of human endurance; fire behavior itself relaxes as temperatures drop, winds grow calmer, and relative humidity rises. A dead fuel moisture reduction of a few percent can increase flammability, flame length, and subsequent overall fire behavior.

When fires remain active at night, it can increase both the time to containment and total burned area, while also affecting public health and safety through more smoke production and lower air quality.

The rapid increase in the rate of warming in California and other parts of the West since the start of the new century is a sharp reminder that we can't count on the future changing as slowly as the past. When asked about the July nighttime heat in California, California state climatologist Mike Anderson stated: "As for the past decade or two, we have noticed observations that have looked different than the rest of the historical record. We are consistently sampling at the warm edge of the historical distribution now, and expectations are for that to continue, with new records being set with increasing frequency in the coming years" (Lindsey, 2018).

Tables 9 and 10 list California's top 20 largest and top 20 most destructive wildfires. In both cases, 15 out of 20 of these fires (75%) occurred in the 21st century (CAL FIRE, January 15, 2019).

Table 9 – Top 20 Largest Wildfires

Top 20 Largest California Wildfires

	FIRE NAME *(CAUSE)*	DATE	COUNTY	*ACRES*	STRUCTURES	DEATHS
1	MENDOCINO COMPLEX *(Under Investigation)*	July 2018	Colusa County, Lake County, Mendocino County & Glenn County	459,123	280	1
2	THOMAS *(Under Investigation)*	December 2017	Ventura & Santa Barbara	281,893	1,063	2
3	CEDAR *(Human Related)*	October 2003	San Diego	273,246	2,820	15
4	RUSH *(Lightning)*	August 2012	Lassen	271,911 CA / 43,666 NV	0	0
5	RIM *(Human Related)*	August 2013	Tuolumne	257,314	112	0
6	ZACA *(Human Related)*	July 2007	Santa Barbara	240,207	1	0
7	CARR *(Human Related)*	July 2018	Shasta County, Trinity County	229,651	1,604	7
8	MATILIJA *(Undetermined)*	September 1932	Ventura	220,000	0	0
9	WITCH *(Powerlines)*	October 2007	San Diego	197,990	1,650	2
10	KLAMATH THEATER COMPLEX *(Lightning)*	June 2008	Siskiyou	192,038	0	2
11	MARBLE CONE *(Lightning)*	July 1977	Monterey	177,866	0	0
12	LAGUNA (POWERLINES)	September 1970	San Diego	175,425	382	5
13	BASIN COMPLEX *(Lightning)*	June 2008	Monterey	162,818	58	0
14	DAY FIRE *(Human Related)*	September 2006	Ventura	162,702	11	0
15	STATION *(Human Related)*	August 2009	Los Angeles	160,557	209	2
16	CAMP FIRE (Under Investigation)	November 2018	Butte	153,336	18,804	86
17	ROUGH *(Lightning)*	July 2015	Fresno	151,623	4	0
18	McNALLY *(Human Related)*	July 2002	Tulare	150,696	17	0
19	STANISLAUS COMPLEX *(Lightning)*	August 1987	Tuolumne	145,980	28	1
20	BIG BAR COMPLEX *(Lightning)*	August 1999	Trinity	140,948	0	0

*There is no doubt that there were fires with significant acreage burned in years prior to 1932, but those records are less reliable, and this list is meant to give an overview of the large fires in more recent times.
**This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.

1/15/2019

Table 10 – Top 20 Most Destructive Wildfires

Top 20 Most Destructive California Wildfires

	FIRE NAME *(CAUSE)*	DATE	COUNTY	ACRES	*STRUCTURES*	DEATHS
1	Camp Fire *(Under Investigation)*	November 2018	Butte County	153,336	18,804	86
2	TUBBS *(Under Investigation)*	October 2017	Napa & Sonoma	36,807	5,636	22
3	TUNNEL - Oakland Hills *(Rekindle)*	October 1991	Alameda	1,600	2,900	25
4	CEDAR *(Human Related)*	October 2003	San Diego	273,246	2,820	15
5	VALLEY *(Electrical)*	September 2015	Lake, Napa & Sonoma	76,067	1,955	4
6	WITCH *(Powerlines)*	October 2007	San Diego	197,990	1,650	2
7	WOOLSEY (Under Investigation)	November 2018	Ventura	96,949	1,643	3
8	CARR *(Human Related)*	July 2018	Shasta County, Trinity County	229,651	1,604	8
9	NUNS *(Under Investigation)*	October 2017	Sonoma	54,382	1,355	3
10	THOMAS *(Under Investigation)*	December 2017	Ventura & Santa Barbara	281,893	1,063	2
11	OLD *(Human Related)*	October 2003	San Bernardino	91,281	1,003	6
12	JONES *(Undetermined)*	October 1999	Shasta	26,200	954	1
13	BUTTE *(Powerlines)*	September 2015	Amador & Calaveras	70,868	921	2
14	ATLAS *(Under Investigation)*	October 2017	Napa & Solano	51,624	783	6
15	PAINT *(Arson)*	June 1990	Santa Barbara	4,900	641	1
16	FOUNTAIN *(Arson)*	August 1992	Shasta	63,960	636	0
17	SAYRE *(Misc.)*	November 2008	Los Angeles	11,262	604	0
18	CITY OF BERKELEY *(Powerlines)*	September 1923	Alameda	130	584	0
19	HARRIS *(Under Investigation)*	October 2007	San Diego	90,440	548	8
20	REDWOOD VALLEY *(Under Investigation)*	October 2017	Mendocino	36,523	546	9

**"Structures" include homes, outbuildings (barns, garages, sheds, etc) and commercial properties destroyed.
***This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.

1/15/2019

3.4 SISKIYOU COUNTY'S WILDLAND FIRE ENVIRONMENT

Countryman (1972) defines the fire environment as "the conditions, influences and modifying forces that control fire behavior." Wildland fire behavior responds to the interaction of fuels, topography and weather. These three factors affect the likelihood of a fire starting, the speed, direction and intensity of the fire and the resistance to firefighting control efforts. This section is general in scope and describes an overview of the wildland fire environment within and surrounding the community of Siskiyou County.

NOTE

The following sub-sections describing elements of the fire environment are general in scope to reflect Siskiyou County in total. In developing local CWPPs, it is important to account for more localized area fire environment features.
See *Part II. Planning Regions* for information particular to each of these geographic areas.

3.4.1 Fuels

Vegetation is the primary fuel source for wildfires and is the most important factor in determining fire hazard; many human-made sources also become fuel, including structures and ornamental vegetation. These contribute to the fire environment and can significantly affect fire behavior (see *Section 3.1.1*, *Figure 9 – Countywide Vegetation/Fuel Model Map*).

Figure 16 provides an aerial county view (Google Earth, 2018) reveals diverse and heavily fueled terrain as predominant in the landscape. The speckled rural community/populations appear geographically inconsequential in landscape features.

Figure 16 – Google Earth aerial view of Siskiyou County

Over 60% of Siskiyou County is undeveloped national forest land and the intrinsic fuel composition and structure is largely unmanaged. Natural vegetation that can burn during a wildfire is termed 'wildland fuels'. Over the last several decades, much of the wildland forest area fuels have morphed into densely overstocked and unhealthy conditions which can produce high severity fires. The interface between the communities and forest is a potentially hazardous location during wildfires as modeled fire intensity is often greatest in this zone.

In recent years many communities are incorporating areas of natural vegetation called 'Open Spaces' in their plans. However, limited wildland fuels management in these Open Space areas pose problems that affect community resilience with respect to wildfire. The International Association of Fire Chiefs (IAFC), Wildland Fire Policy Committee (WFPC) developed a definition that describes this geographic challenge which communities throughout the United States experience on a regular basis. From a wildfire protection perspective, the term "Open Space" areas can be defined as "the lands that produce wildfires and/or are threats to our communities, that are surrounded by our communities." These wildland fuel source areas are typically surrounded by structures. The Open Spaces occur in many shapes, from an island of open space to a ribbon of open space extending into the community similar to a wick or fuse. Examples of lands within communities (Fennesy, 2014):

- Habitat conservation land
- Natural vegetation parklands
- Watersheds held by a public entity
- Land that is not developable that is covered with natural vegetation
- Power line corridors

Regardless of whether fuel sources are located in wildland surrounding a community or in "urban open space" within a community, the following sub-sections provide scientific aspects of fuels to better understand their physical properties and direct relationship to wildfire.

3.4.1.1 Fuel Characteristics

Characteristics of wildland fuels that affect fire behavior include fuel type, fuel moisture content, fuel loading (the amount of fuel expressed as tons/acre), chemical content, horizontal continuity, and vertical arrangement. Each of these characteristics contributes to one or more fire behavior processes. Understanding the association between fuel characteristic and fire behavior can facilitate the design of effective fuel treatment strategies.

3.4.1.1.1 Fuel Types/Fuel Models

Fuel types within and adjacent to the community include grasses, shrubs/brush, hardwood trees, coniferous trees and ground litter associated with forested areas. Fuel types are broken into specific fuel models that describe the physical properties of vegetation that support wildfire. Each specific fuel model has associated burning characteristics. Burning characteristics can change significantly, as fire spreads through different fuel models across a landscape. Through the removal or rearrangement of vegetation, it is possible to modify the fuel model and therefore modify the fire behavior at a specific location on the greater landscape (Scott, J.H. & Burgan, 2005).

3.4.1.1.2 Fuel Moisture

Fuel moisture is a dynamic variable controlled by seasonal and daily variations in the weather. The moisture of living and dead fuel is an important component that influences wildland fire behavior. Moisture has to be eliminated or significantly reduced from a fuel before it is available to burn. Simply stated, vegetation is most flammable when fuel moisture levels are low and less flammable when fuel moisture levels are high. The amount of moisture in a fuel will largely determine if fuel is ready also termed 'available' to burn.

Manzanita: dead and live fuels
Courtesy of J. Titus

The fire environment influences two types of fuel moistures: dead fuel moisture and live fuel moisture. Dead fuels act like a sponge absorbing or giving up moisture to the air and ground that surrounds the fuel. This exchange of moisture with the environment changes the fuel moisture content of dead fuels. In general, the more moist the air or ground the more moist the fuel, and conversely the more dry the air and ground the more dry the dead fuel.

Fire managers use the concept of "timelag" to define how rapidly this exchange of moisture occurs between dead fuel and the surrounding environment. Smaller diameter fuels such as dry grasses exchange moisture quite rapidly. This is why a dry grass field may be covered in dew early on a summer morning, but can burn in a wildfire later that same afternoon. Table 11 displays the rate of exchange of moisture between dead fuel and the environment. Times shown reflect the hours required for 2/3 of the volume of a dead fuel to come into equilibrium with its surrounding environment. Timelag is the time required to reach equilibrium. (Andrews, 2008)

Table 11 - Dead Fuel Moisture & Timelag Relationship to Fuel Size

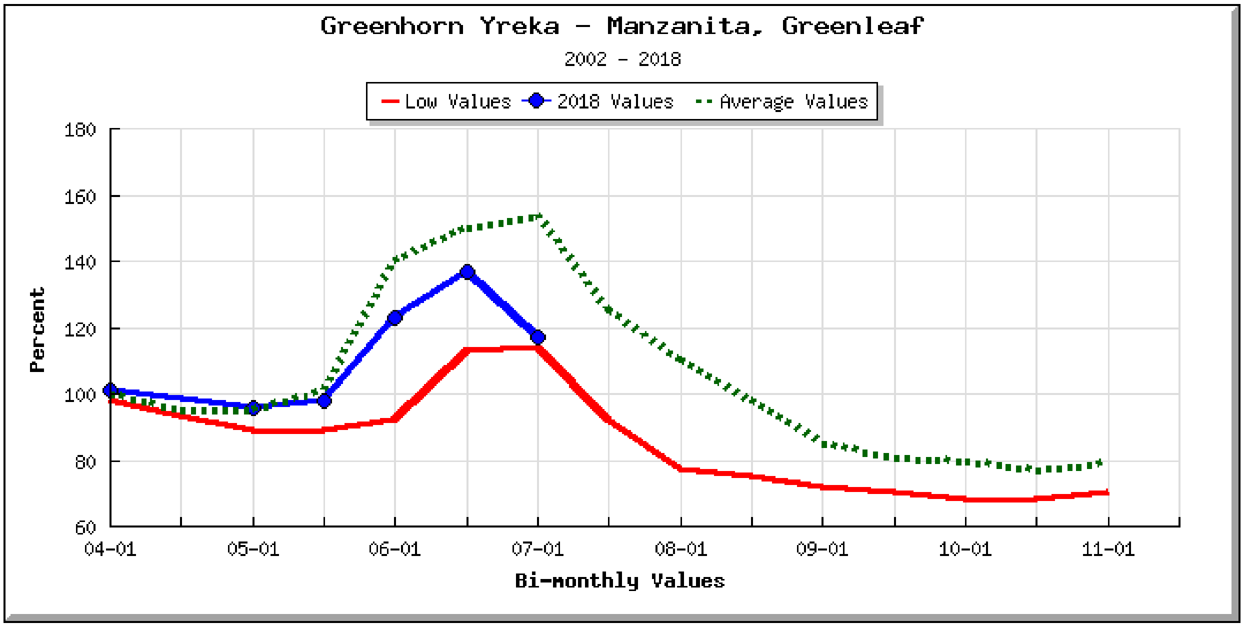
Diameter Class	Timelag	Fuel Description
0 – 0.25"	1-hour	Grasses, forbes
0.25 – 1.0"	10-hour	Small sticks and branches
1.0 – 3.0"	100-hour	Larger branches, small logs
3.0" and greater	1000-hour	Larger logs

Live fuel moisture is the moisture in living, growing vegetation. Regulation of live moisture is through internal physiological mechanisms and external influences such as rainfall patterns, drought, aspect, elevation, and normal seasonal drying patterns. Typically, live fuel moistures in the area are highest in the spring through early summer and at their lowest in late summer through winter. The following is a brief video that further explains live fuel moistures and the relation to wildland fire: https://www.youtube.com/watch?v=a8hD5wwcevI.

There are local programs through both national forests and state agencies that conduct live fuel moisture sampling and data analyses of indigenous fire-carrier species. As an example, Figure 17 displays current, average and low fuel moisture data for Greenleaf Manzanita from the

Greenhorn, Yreka area with values ranging from as low as 60% to as high as 160% (https://www.wfas.net/index.php/national-fuel-moisture-database-moisture-drought-103).

Figure 17 - Example Fuel Moisture Data



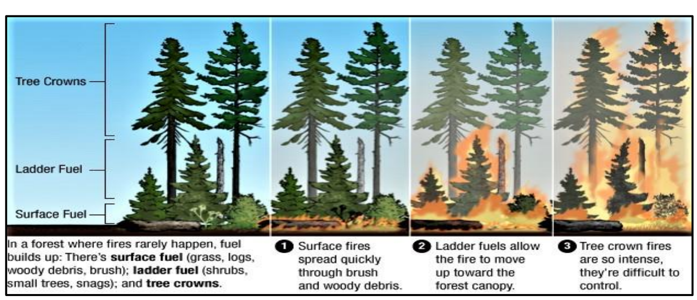
3.4.1.1.3 Fuel Loadings

Fuel loadings vary greatly by fuel types. Generally, grasslands produce fuel loadings between 1 to 5 tons per acre, while brush species may produce 10 to 50+ tons per acre, and timberland loadings can range from 10 up to 150+ tons per acre. Fuel loading correlates to fire intensity with areas of heavier fuel loads releasing more heat energy than areas with lighter fuel loads.

3.4.1.1.4 Horizontal Continuity

The horizontal continuity of fuels ('fuel bed') describes the uniformity or patchiness of fuels across the landscape and affects the ability of a fire to spread. Within Siskiyou County, fuel continuity is occasionally disrupted by road systems and neighborhoods; however, many roadways lack adequate upkeep in fuel clearance, thereby limiting the disruption of the fuel bed normally associated with road systems. In many areas, riparian corridors also provide continuous fuel pathways into the community.

Wildfire cannot spread through a discontinuous fuel bed without the presence of a strong wind, steep slopes, and/or through ember cast igniting new spot fires ahead of the primary fire front. Fuels throughout Siskiyou County are receptive to flaming or glowing embers ('firebrands'), which leads to a high probability of spot fires occurring within the community, especially when a fire is burning under frontal passage wind conditions.



3.4.1.1.5 Vertical Arrangement

Vertically arranged fuels are those that can carry fire burning in surface fuels into the canopy (i.e., crowns) of taller shrubs and trees. The continuous vertical continuity of the fuel bed is known as "ladder fuels". This condition is common throughout most of Siskiyou County with its extensive coniferous forests and accompanying hardwood-shrub vegetation dominating the natural landscapes.

3.4.1.1.6 Chemical Properties

Chemical properties of fuel relates to the presence or absence of volatile substances such as oils, resins, wax, and pitch. Evergreen coniferous species are resinous and quickly combustible in the wildfire environment. Chaparral species (such as sages) also have higher concentrations of volatile chemical compounds compared to grasses.

During summer months, an increase in ether extractives occurs in vegetation, resulting in increasing combustibility in some plant species (Philpot, Mutch, 1971). Ether extractives in many species can rise from 8.3 to 15% during the summer, making foliage more easily ignitable (Philpot, 1969). An extractive content over 10% indicates high crown fire potential (Philpot, Mutch, 1971).

3.4.2 Weather

Weather is the most variable element of the wildland fire environment and the least predictable. Important components of fire weather are temperature, relative humidity, precipitation, wind, and atmospheric stability, each of which has the potential to enhance or retard wildfire spread and intensity.

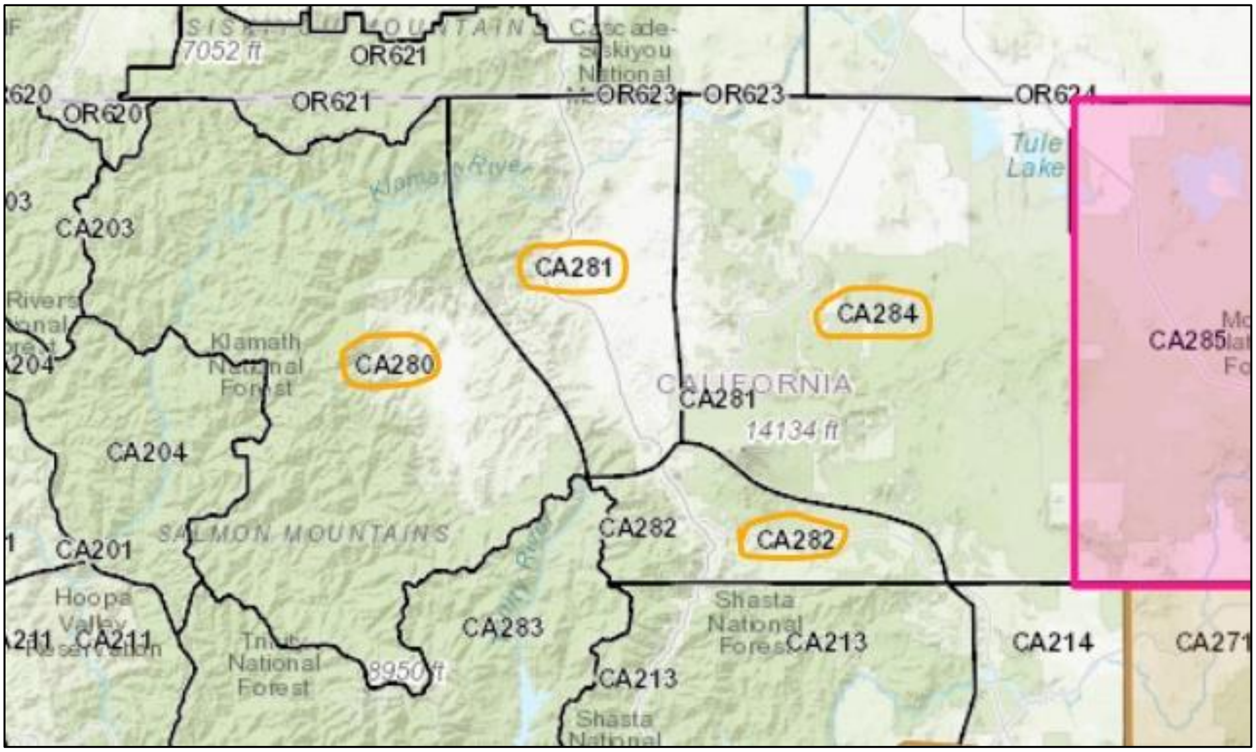
General weather patterns and characteristics differ across the vast and variable landscapes of Siskiyou County. Broad descriptions of climatic influences and weather elements often reflect "westside" vs. "eastside" of the Cascades or Klamath Mountains and "valley" vs. "mountains" elevational variations (see *Section 3.2* above).

The difference between weather and climate is a measure of time. Weather is what conditions of the atmosphere are over a short period of time, and climate is how the atmosphere "behaves" over relatively long periods of time. Weather is basically the way the atmosphere is behaving, mainly with respect to its effects upon life and human activities.

Based on the considerable size and geographic complexity of Siskiyou County, NOAA divides divided the County into four forecasting zones as follows (Figure 18):

- **CA280**: Western Klamath National Forest
- **CA281:** Central Siskiyou County including Shasta Valley
- **CA282:** Shasta-Trinity National Forest in Siskiyou County
- **CA284:** Siskiyou County from the Cascade Mountains east and south to Mount Shasta

Figure 18 – Siskiyou County's Four Forecasting Zones (NOAA)



Fire weather elements in each of these zones can fluctuate largely within the zone and will often differ substantially from zone to zone. Many physical factors influence or alter a weather element and in many cases the changes are relatively predictable on a daily and/or hourly basis. Wildfire, explained in scientific terms, is chemical process involving oxygen, fuel and heat. Local weather factors will significantly affect the stages of the wildfire process from the ignition phase, to the flaming propagation phase, and in the cool-down phase as it dies out. On-site weather elements (temperature, relative humidity, precipitation, and winds) are constantly monitored in a wildfire suppression or management operation and play a key role in the strategy and tactics.

Frontal passages and associated wind events create fire weather alert situations (red-flag watch/warnings) in any of the weather zones. During these wind events, the dry season conditions with low relative humidity, dry fuels, heat and little to no nighttime humidity recovery produce a recipe for rapid wildfire growth. Types of frontal passages are mentioned previously in *Section 3.2.1* above.

Weather element variations can be affected by physical environment factors, including terrain features, elevation, diurnal distinctions, atmospheric stability changes and proximity to a water body or corridor. In many cases, multiple physical factors exist within or adjacent to the communities across Siskiyou County, and add complexity to a wildfire ignition by producing a wide-ranging influence on weather elements. The environmental factor differences range from subtle to substantial depending on the location. This is further explained in each Planning Region description (see *Appendix A*).

3.4.2.1 Problematic Weather Scenarios

During the summer fire season, the general weather conditions consist of light to moderate winds (in a direction/azimuth often influenced by diurnal and/or topography), hot temperatures, low humidity and poor night-time humidity recovery. Under these conditions, a wildfire ignition may begin as a surface fire but can rapidly transition to a crown fire with potential spot fire ignitions occurring a considerable distance ahead of the main fire. The dry air and atmospheric conditions aligning with low fuel moistures, combined with a wind component, often cause considerable resistance to containment by firefighting resources, unless the suppression response and actions occur in immediate post-ignition phase.

Severe "red-flag" wildfire weather conditions are a common occurrence in Siskiyou County throughout the summer and fall seasons and can also occur into the winter. Two of the more common triggers of these red-flag situations are:

1) A forecasted dry lightning event (an electrical storm without the precipitation stage). These events tend to will occur over the higher elevations and mountainous terrain. Strong erratic updraft and downdraft winds can occur during these events and will create short-term flare-ups in fire behavior.

- Frequently, once these storms abate, they leave in their wake several new wildfire ignitions across often inaccessible terrain. Examples of this scenario have occurred regularly over the Klamath Mountains in the past decade. Recent examples include 2017's Salmon-August Complex and Eclipse Complex which burned 100,000+ acres over the course of 3 months. Steep inaccessible terrain, effects of drought on conifer forests, extremely low fuel moistures and lack of suppression resources hampered fire management actions.

2) High winds associated with frontal passages and atmospheric pressure gradient changes. This is the most common causal factor of red flag wildfire alerts throughout the fire season. This condition can become extended in duration, ranging from 4-8+ hours, to multiple days. When added to a dry air mass and low fuel moisture conditions, gusty high winds can cause a wildfire to quickly become explosive in behavior and characteristics.

- This high wind (dry frontal passage) scenario often occurs over lower slopes and through valley areas, thereby directly impacting populations, community dwellings and infrastructure. When these types of winds merge with an active wildfire, the increased fire-spread and intensities will quickly exceed the ability of firefighting personnel to suppress. The Boles Fire in the community of Weed illustrates this disastrous scenario. The September 15, 2014 on site weather conditions during the initial stages (89 degrees, 13% relative humidity, winds south at 26 mph, and with gusts to 39 mph) resulted in rates of spread in excess of 1.25 miles (100+ chains) per hour), flame heights of >75' and spotting distances of 1.5-1.75 miles. The severity of this type fire behavior resulted in catastrophic loss to the small rural community of Weed.
- A similar wind event scenario happened on July 5, 2018 when the Klamathon fire occurred southeast of Hornbrook. The south winds fanned flames into dry fuels and

quickly spread through the WUI adjacent to Hornbrook. Extreme wildfire behavior with rapid spread rates and high intensities moved quickly from open space wildlands into WUI and transitioned to an urban/intra-community (within the community) fire, overwhelming local firefighting personnel and emergency response agencies. The fire continued to grow to the north-northeast and eventually crossed the Oregon border, burning in fuels that had no record of previous fire history. The outcomes were profound, with loss of life, structures, infrastructure, as well as natural and cultural resources. Both Boles and Klamathon fires were human caused starts in WUI zones.

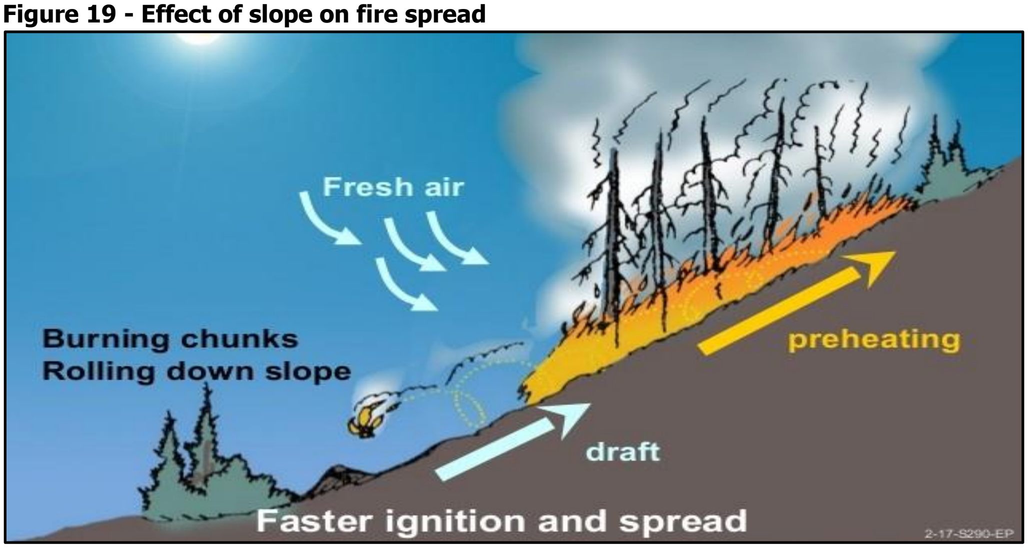
3.4.3 Topography

Topography is the configuration of the earth's surface including its relief and the position of its natural and human-made features. It is the most stable of the elements in the fire environment and plays an important role in how a fire will burn. Factors of topography that affect fire behavior include slope, aspect, terrain or land features, and elevation. Topography modifies general weather by channeling wind, inducing slope and valley winds, creating thermal belts, producing orographic (pertaining to or caused by mountains) thunderstorms, and contributing to Foehn (or Northerly) winds. Of all the topographic features, the steepness of slope is the most influential on fire behavior.

Covering 6,347 square miles, Siskiyou County is the fifth largest county by area. The Southern Cascade and Klamath Mountains are prominent displays of topographical diversity. Elevations range from the highest peak at 14,136' (Mount Shasta) to a low of 682'. Many river and stream canyon features dissect the land; the major ones being Sacramento, Klamath and Trinity and McCloud rivers The Klamath Mountains dissect the landscape in the northwest area similarly to the Southern Cascades dividing the southeast portion of the area. These steep mountain ranges create topographical diversity and directly affect environmental factors including soil types, vegetation types, climate and weather.

Topography is the more predictable fire environment factor. A basic and important fire science principle is the fact that fire will burn faster uphill. On a slope, flames can easily reach more unburned fuel in front of the fire. Radiant heat pre-heats the fuel in front of the fire, making the fuel even more flammable, as illustrated in Figure 19.

Figure 19 - Effect of slope on fire spread



The slopes of the Klamath and Southern Cascade mountain ranges often rise rapidly with a steepness ranging from 45-70% or more. Wildfire management personnel study and conduct training to learn how to address the expected increases in fire spread on steep slopes. However, in most circumstances, an added difficulty is the overall lack of safe access into these steeper forested areas.

3.4.4 Fire Behavior Characteristics

Fire behavior characteristics describe how a fire will burn, where it burns, how fast it spreads, and the amount of energy it releases. Extensive research has been conducted over the last 60+ years in wildland fire science. Exploration in this field continues today at multiple research stations/labs across the country and abroad, most of which builds upon the foundational science initiated in the late 1950's and early 1960's beginning with Dr. Richard C. Rothermel.

The diversity of fuels, topography and weather across Siskiyou County exhibits a fire environment that supports a full spectrum of fire behavior. As previously stated, fuel types are the basis of fire behavior estimates. There are entire courses that explain the detailed science of wildfire behavior. The following are general concepts to help understand fire behavior aspects presented in this CWPP.

TERMINOLOGY TIP

Fire Behavior (FB): The manner in which a fire reacts to the influences of fuel, weather, and topography

Fuel Model (FM): Simulated fuel complex for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

(NWCG Glossary of Wildland Fire)

Broad categories of the types of wildland fire observed on the landscape include:

- **Ground fires:** Fire burning in the organic material beneath the surface litter, such as the layer of duff, roots, and buried or partially buried dead and decaying woody material.
- **Surface fires:** Fire burning in material above the ground including low vegetation such as grasses, low shrubs, small trees, and woody debris on the soil surface.
- **Torching fire:** The burning of the foliage of a single tree or a small group of trees, from the bottom up.
- **Crown fires:** Fire burning in the tops of trees and tall shrubs or brush. The classification of crown fires include passive, active, and independent.
- **Spotting:** Occurs when wind, convection, or gravity outside the main perimeter of the fire transport firebrands. Whether or not a "spot fire" develops is dependent on if a firebrand lands on a receptive fuel.

Generally, three primary characteristics utilized to measure fire's behavior are quantified in terms of:

- **Rate of Spread (ROS):** Rate of forward spread of the flaming front, often measured in chains per hour (Ch/hr.). Chain is a unit of length equal to 66 feet (22 yards); 80 chains = 1 mile.

- **Fire Line Intensity (FLI):** The rate of heat release per unit time per unit length of fire front, expressed as (BTU/ft./sec).
- **Flame Length (FL):** The average distance from the base of the flame to its highest point. FL is the standard field measurement related to FLI.

Wildfire spread rates and intensities are largely differentiated by the fuel that is actively burning. Table 12 briefly depicts surface fire characteristics per broad fuel type, clearly identifying how rapidly a fire can move in fine dead fuels and the high intensity level (FL) of the heavier fuels.

Table 13 depicts interpretations of fire suppression capability per given Flame Length outputs and Fire Line Intensities

Table 14 provides adjective descriptions and ratings used in this CWPP to categorize the severity levels of fire behavior with accompanying color scheme variation indicating increasing wildfire severity.

Table 12 - Estimated FB Characteristics per Primary Fuel Type

Primary Fuel Type	Fuel Load (Tons/Ac)	Fuel Bed depth (ft.)	ROS* (Ch/hr.)	FL* (ft.)
Grass	0.5 – 3.0	1 - 3	75 – 104	4 - 12
Brush/Shrub	4 – 22	2 - 6	18 - 75	5 – 20+
Timber litter	5 - 15	0.2 – 1.0	2 - 8	1 - 5
Slash debris	13 - 60	1 - 4	6 - 14	4 - 11

**ROS and FL are represented under a fine dead fuel model of 8%; midflame windspeed of 5 mi/hr; live fuel model 100% (Anderson 1982)*

Table 13 - Fire Suppression Interpretations based on FL and FLI

FL (ft)	FLI (BTU/ft/s)	Interpretation
< 4	< 100	Fire can generally be attacked at the head or flanks by hand line (a fireline built with hand tools).
4 - 8	100 – 500	Fires are too intense for direct attack on the head by hand lines. Hand lines cannot be relied on to hold fire. Equipment such as dozers, engines and retardant aircraft will probably be effective.
8 - 11	500 – 1,000	Fires may present serious control problems such as: torching, crowning and spotting. Control efforts at head of fire will probably be ineffective.
>11	> 1000	Crowning, spotting and major fire runs are probable. Control efforts at head of fire are ineffective.

Table 14 – Adjective Ratings for FB Characteristics

Adjective Class	ROS (Ch/Hr)	FL (ft)
Very Low	0 – 2	0 - 1
Low	2 – 5	1 - 4
Moderate	5 - 20	4 – 8
High	20 - 50	8 – 12
Very High	50 - 150	12 – 25
Extreme	>150	>25

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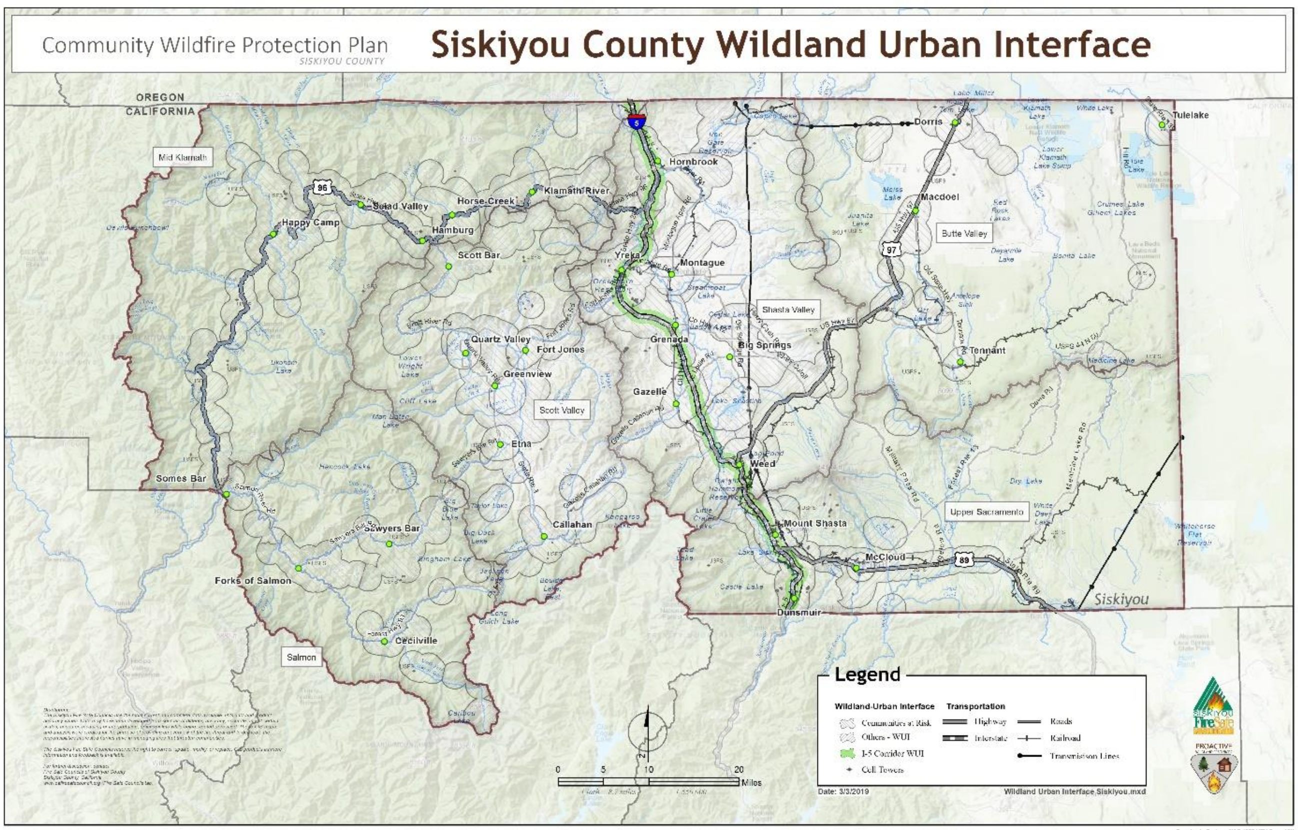
To help protect people and their property from potential catastrophic wildfire, the National Fire Plan directed funding to be provided for projects designed to reduce fire risks to communities. A fundamental step in achieving this goal was the identification of communities that are at high risk of damage from wildfire. These high-risk communities identified within the WUI were published in the Federal Register in 2001. At the request of Congress, the Federal Register notice only listed those communities adjacent to federal lands. The list represents the collaborative work of the 50 states and five federal agencies using a standardized process, whereby states were asked to submit all communities within their borders that met the criteria of containing a home or business related structure at high risk from wildfire. Figure 20 depicts Siskiyou County's Communities at Risk within the designated WUI areas.

Figure 20 - Siskiyou County Communities At Risk with WUI boundaries



With California's extensive WUI situation, the list of Communities at Risk extends beyond just those adjacent to Federal lands. The California State Forester has the responsibility for managing the list.

The Office of the State Fire Marshall currently lists 30 Communities at Risk (CAR) in Siskiyou County (Table 15). Not all listed CARs have an identified "WUI boundary" delineating the area where wildfire could potentially impact their respective community. The Healthy Forest Restoration Act (HFRA) lays out a process for developing this WUI boundary. This countywide assessment uses HFRA guidelines plus the following two data sets to determine boundaries: 1) CAL FIRE's (FRAP) WUI map, and 2) a layer prepared by the USFS. It is incumbent upon the respective FSCs and communities, through the local CWPP process, to ultimately define their WUI boundaries.

Fire Resource Assessment Program (FRAP)

Assesses the amount and extend of California's forests and rangelands, analyzes their conditions, and identifies alternative management and policy guidelines.

Table 15 – Communities at Risk

SISKIYOU COUNTY | COMMUNITIES AT RISK | YEAR OF DESIGNATION	
1. Big Springs - 2001	16. Klamath River - 2001
2. Callahan - 2001	17. Lower Scott River - 2009
3. Cecilville - 2001	18. Macdoel - 2001
4. Dorris - 2001	19. McCloud - 2001
5. Dunsmuir - 2001	20. Montague - 2001
6. Etna - 2001	21. Mount Shasta - 2001
7. Forks of Salmon - 2015	22. Quartz Valley Indian Reservation - 2001
8. Fort Jones - 2001	23. Sawyers Bar - 2001
9. Gazelle - 2001	24. Scott Bar - 2001
10. Greenview - 2001	25. Seiad Valley - 2001
11. Grenada - 2001	26. Somes Bar - 2001
12. Hamburg - 2001	27. Tennant - 2001
13. Happy Camp - 2001	28. Tulelake (Tule Lake) - 2001
14. Hornbrook - 2001	29. Weed - 2001
15. Horse Creek - 2001	30. Yreka - 2001

SECTION 5. WILDFIRE ASSESSMENT

An analysis of wildfire potential utilizes established assessment methods and scientifically accepted fire models. The following is assessment derivative of analysis work completed by CAL FIRE in their FRAP. This work specifically focuses on Siskiyou County's wildfire hazard (fuel rank) and wildfire risk (fire threat). The purpose of this assessment is not to determine wildfire concerns for individual parcels but to provide the framework for prioritizing potential wildfire mitigation strategies for community planning areas. The assessment outputs provide factual tools based on the latest data to help communities and FSCs across the County focus on specific areas of concern and undertake tailored wildfire mitigation planning, which may be further refined through local CWPPs. Local CWPPs should refine analysis using area or local fire weather information coupled with a more detailed assessment of local fuels and vegetation.

CAL FIRE is required by law (PRC 4789) to assess California's susceptibility to wildland fire events on private lands. The last official update occurred in 2010; however, data and policy updates are in progress and will include the 2017 and 2018 fire seasons. Data are available on the CAL FIRE FRAP web page (http://frap.fire.ca.gov) but access may be intermittent due to ongoing updates. Specific to Siskiyou County, this assessment involved utilizing available CAL FIRE information from their FRAP data because it is readily available and vetted by data managers. FRAP data is a consistent statewide reference for agencies, local FSCs, and community citizens.

5.1 WILDLAND FIRE HAZARD SEVERITY

PRC 4201-4204 and Government Code 51175-89 direct CAL FIRE to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), aid in defining the application of various mitigation strategies to reduce risk associated with wildland fires.

The Fire Hazard Severity rating system is a way to measure or model physical fire behavior so that potential wildfire damage can be predicted. Fire Hazard Severity is an assessment of the threats or potential impacts arising from wildland fire. Hence, it is the sum interaction of burnable vegetation, the likelihood of a wildfire burning, weather, and exposure of human values (FRAP, CAL FIRE, 2008).

Fire models provide a quantitative basis for rating fire danger and predicting fire behavior, and became possible with the development of mathematical fire behavior models (Rothermel 1972). These modeling concepts continue to be the basis of current wildfire prediction work.

Fire Hazard Severity is measured by outputs including the speed that a wildfire moves, the amount of heat it produces, and most importantly, the firebrands it sends ahead of the flaming front. This assessment is used on private lands per State law, applicable to SRA lands, and utilized/referenced in LRA areas as well (see *Section 1.4.1* for agency responsibility definitions).

As detailed in *Section 3.4,* the four fundamental elements that influence and predict fire behavior are wildland fuels (vegetation), topography, weather, and the production of firebrands (how far they move, and how receptive the landing site is to new fires). This CWPP focuses on fuel, the only component of wildland fire behavior that humans can manipulate.

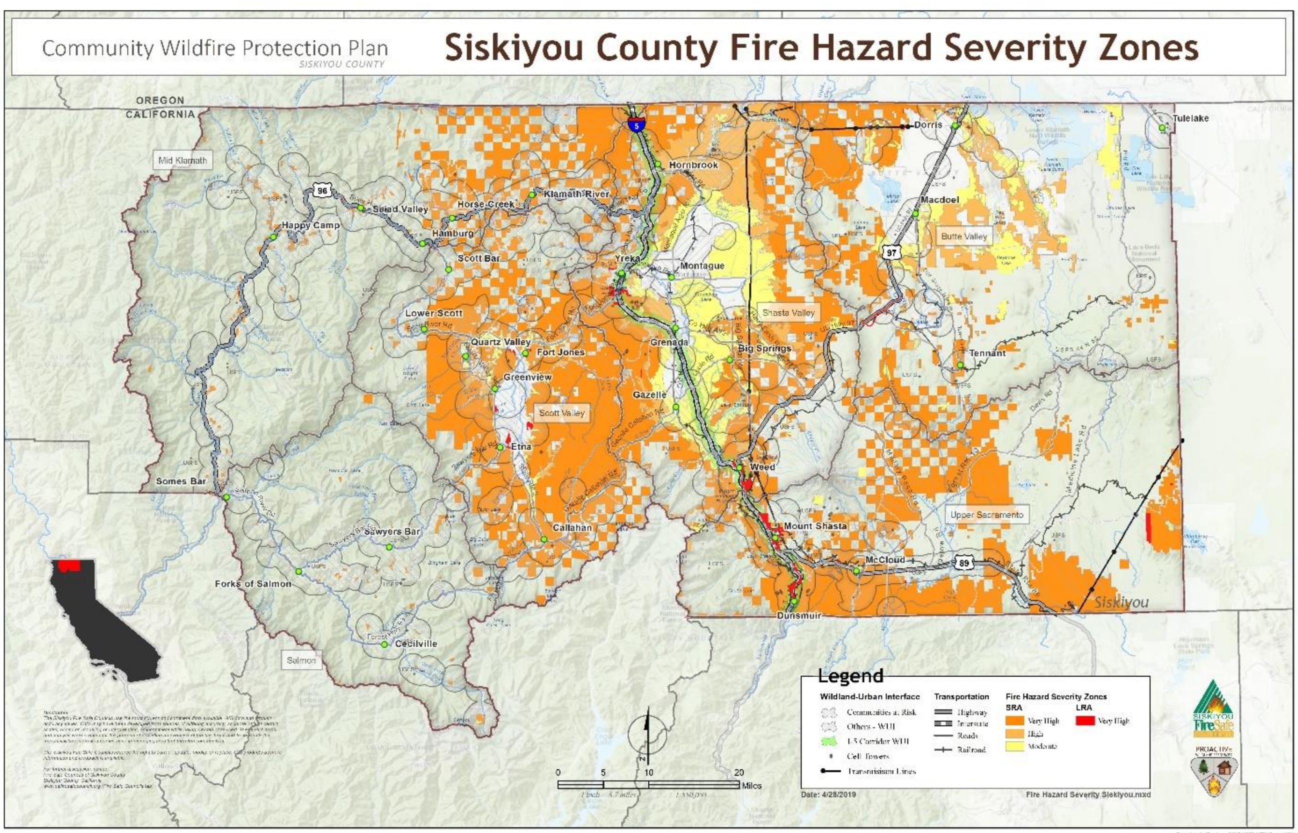
5.1.1 Fire Hazard Severity Zones

The following maps have been created by CAL FIRE's FRAP. They depict Fire Hazard Severity Zones (FHSZs) as approved by CAL FIRE and required by law. Zones are created using data and models that describe fire development patterns and estimated behavior characteristics based on potential fuels over a 30-50 year time horizon. Details on the project and specific modeling methodology can be found on the FRAP website (FRAP, CAL FIRE, 2008).

FHSZs provide the basis for the application of various mitigation strategies to reduce risks to buildings associated with wildland fires. The zones also relate to the requirements for building codes designed to reduce the ignition potential to buildings in WUI zones and are indicators for the insurance industry for insuring a structure against the loss from wildfire. Figure 21 depicts Siskiyou County's wildfire hazard severity ratings for both SRA and LRA. Descriptions of source information for the FHSZs are as follows:

> **FHSZ - State Responsibility Area (SRA):** PRC 4201-4204 directed CAL FIRE to map fire hazard within SRAs, based on relevant factors such as fuels, terrain, and weather. The data was adopted in November 2007 and updated in 2008. There are three categories required for SRA lands: Moderate, High and Very High.
>
> **FHSZ - Local Responsibility Area (LRA):** This map includes a geographic information system (GIS) dataset that depicts final CAL FIRE recommendations for Very High FHSZs within LRAs. In 2008, the California Building Commission adopted California Building Code Chapter 7A requiring new buildings in areas of Very High FHSZs to use ignition resistant construction methods and materials.

Figure 21 – FHSZ – SRA and LRA



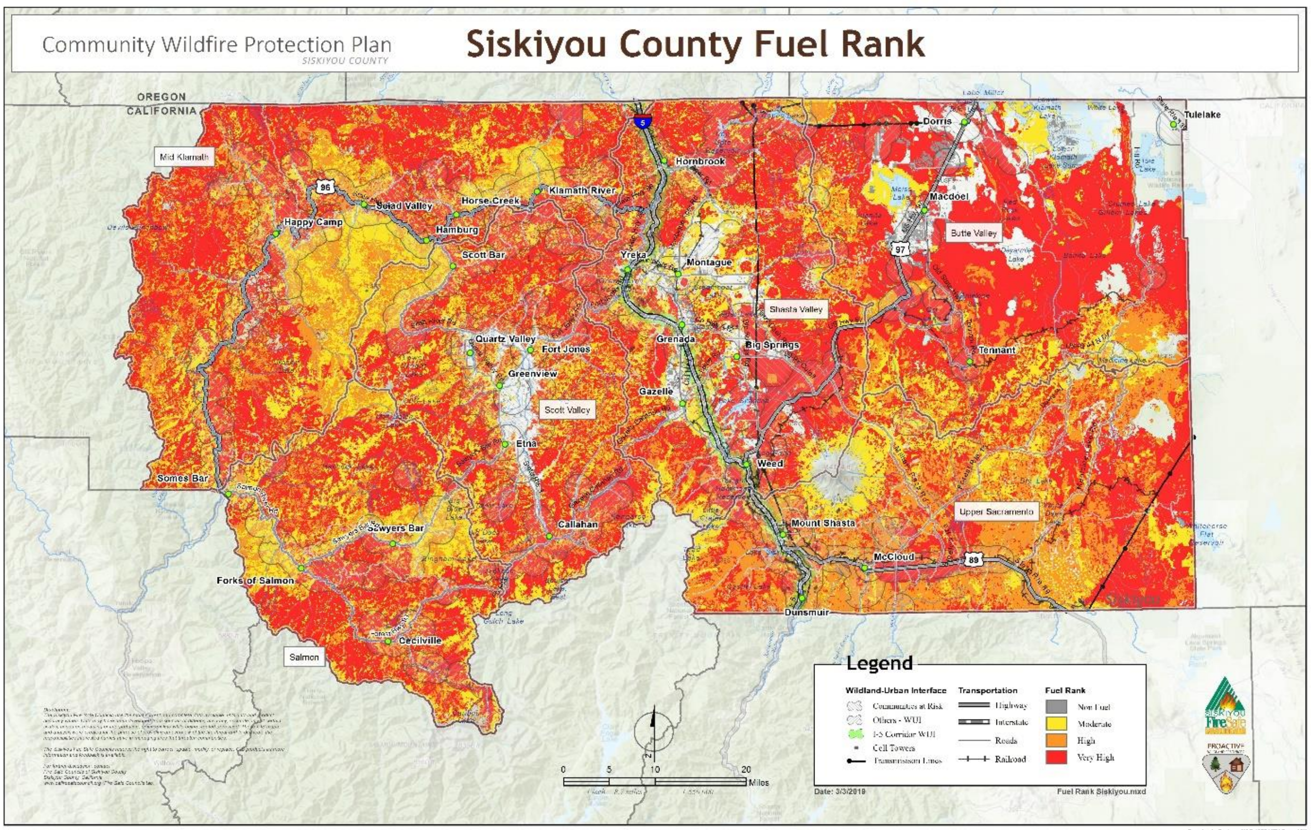
5.2 COMPONENTS OF FIRE HAZARD SEVERITY

Note: Appendix B (Glossary) is a helpful tool in understanding the terminology used in this wildfire assessment and in the action planning sections of this CWPP.

5.2.1 Fuel Rank

Fuel rank is a means of displaying model results of the potential a wildfire has upon a landscape. For the purposes of this analysis, Fuel Rank will be used as a proxy for fire hazard. CAL FIRE has developed a Fuel Rank assessment methodology for the California Fire Plan to identify and prioritize pre-fire projects that reduce the potential for large catastrophic fire. The model methodology assigns ranks based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, and temperature). The outcome reveals an initial assessment of rank based on an assigned fuel model and slope (see Figure 22). Fuel Rank assessment and associated concepts is a similar process to that of a Fuel Hazard assessment; also utilized in modeling potential wildland fire behavior, so noted to acknowledge/clarify parallel terminology.

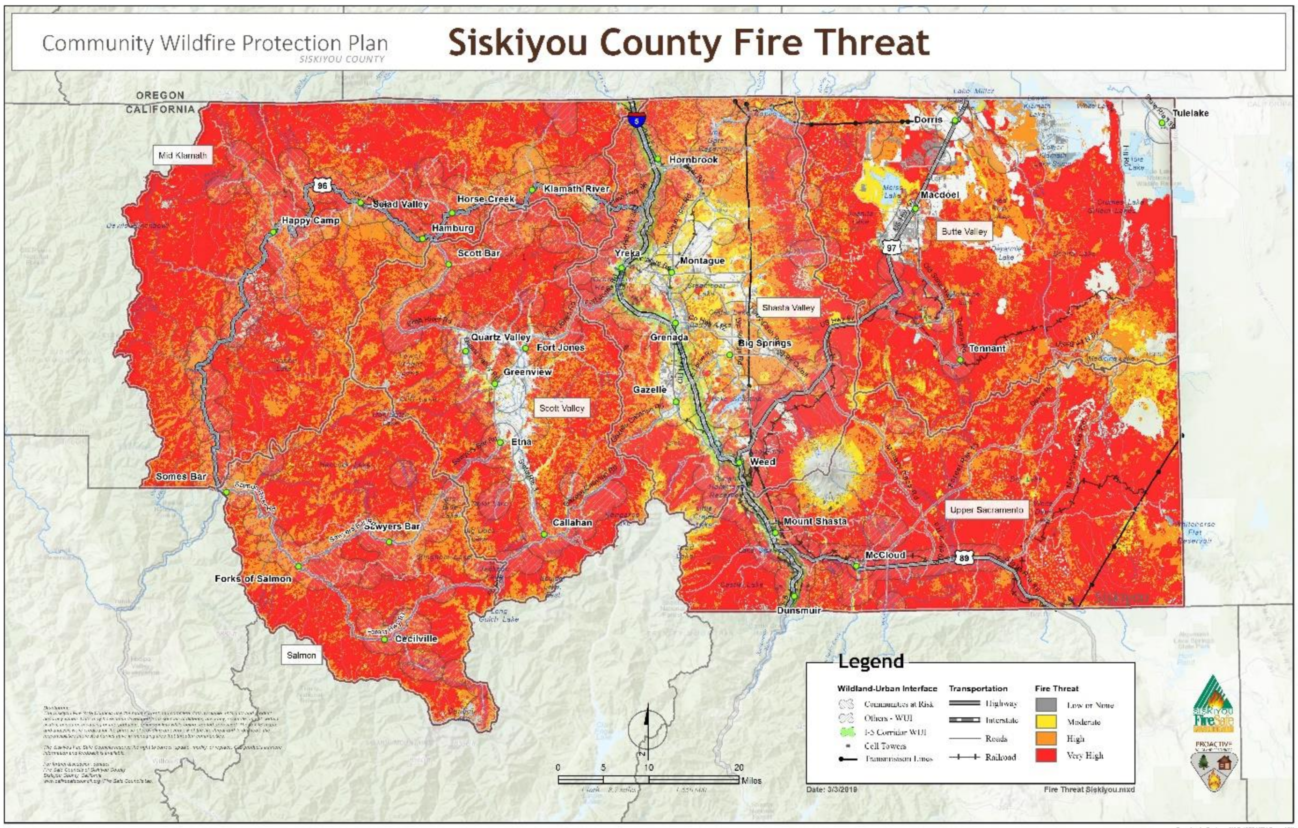
Figure 22 – Fuel Rank Map of Siskiyou County



5.2.2 Wildland Fire Threat

Wildland Fire Threat is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create four threat classes (see Figure 23). Fire threat can be used to estimate the potential for impacts, or risk of a wildfire, on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes. (FRAP Forest and Range 2003 Assessment on-line technical report "Trends in Wildland Fire" - see *Appendix A – References*).

Figure 23 – Fire Threat Map of Siskiyou County



5.3 ASSESSMENTS BY PLANNING REGION

The following provides an explanation of the science and procedures involved in wildfire assessment specific to each of the six Planning Regions. Complete details for all aspects of each Planning Region are provided in *PART II. Planning Regions*.

5.3.1 Wildfire Hazard

> **TERMINOLOGY TIP**
>
> **Hazard:** Any real or potential condition that can cause injury, illness or death of personnel, or damage to, or loss of equipment or property. When determining potential wildfire hazard, the immediate and surrounding vegetation or fuels are key in the assessment.
>
> **Hazard Fuel**: A fuel complex (group of fuels) defined by kind, arrangement, volume, condition, and location that presents a threat of ignition and resistance to control.
>
> *NWCG Glossary*

Fire hazard is the major underpinning of the Fuel Rank modeling depicted above. Hazard levels are represented by vegetation/fuels *in relation to the energy output when it burns*. Vegetation is classified into "fuel profiles" or grouping of burnable material that tends to burn in a similar manner. Fire managers and researchers use fuel profiles as the basis for modeling to help predict fire spread and intensity; in this process fuel profiles are referred to as a "fuel models". Grass dominant fuel models will spread fifteen times faster than fuels burning in an understory such as timber or a fire burning under the shrubs (canopy dominated fuel models). Canopy dominated fuel models such as volatile brush fuel models or tree level canopies engulfed in flames burn four times faster than a timber under story (Bishop). Wildfire in grass-based fuel profiles can become large very quickly. Fires in heavy timber tend to burn more slowly but can create greater heat, impeding fire suppression actions. Table 16 displays a current Landfire (satellite-based fuels assessment) of fuel models across the county. Table 17 displays the percentage of the fuel models types to display how they could affect fire behavior.

Table 16 - Acres of Primary Fuel Models

Acres of Primary Fuel Models by Planning Region								
Fuel Type	**Butte Valley**	**Mid Klamath - East**	**Mid Klamath - West**	**Salmon**	**Scott Valley**	**Shasta Valley**	**Upper Sac - East**	**Upper Sac - West**
Grass	92,297	61,000	30,932	42,101	77,834	192,922	1,378	5,039
Grass/ Shrub	231,701	34,694	58,990	54,177	106,949	133,774	19,685	159,884
Shrub	110,219	40,403	77,892	55,825	102,679	73,580	2,225	18,997
Timber Litter	103,275	67,072	121,866	129,634	108,832	78,609	24,141	134,660
Timber Understory	124,066	86,833	251,600	159,490	112,223	97,402	72,038	254,531
Slash/ Blowdown	-	1	4	41	1	-	-	-
Low-Non burnable	126,249	6,383	12,738	13,901	44,405	98,778	12,695	31,721
Total	**787,807**	**296,386**	**554,023**	**455,170**	**552,924**	**675,064**	**132,162**	**604,832**

Table 17 - Percentage Acreage of Primary Fuel Models

Percentage Acreage of Primary Fuel Models by Planning Region								
Fuel Type	Butte Valley	Mid Klamath - East	Mid Klamath - West	Salmon	Scott Valley	Shasta Valley	Upper Sac - East	Upper Sac - West
Grass	12%	21%	6%	9%	14%	29%	1%	1%
Grass/ Shrub	29%	12%	11%	12%	19%	20%	15%	26%
Shrub	14%	14%	14%	12%	19%	11%	2%	3%
Timber Litter	13%	23%	22%	28%	20%	12%	18%	22%
Timber Understory	16%	29%	45%	35%	20%	14%	55%	42%
Slash/ Blowdown	0%	0%	0%	0%	0%	0%	0%	0%
Low-Non burnable	16%	2%	2%	3%	8%	15%	10%	5%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

5.3.2 Wildfire Risk Element

Wildland fires are started by humans or lightning (natural causes). As a whole, lightning is the greatest progenitor of large wildfires as they frequently occur in the more isolated, remote areas of the County and can occur at a rate that overwhelms the number of firefighting resources available.

Human caused fires are frequently started in lower elevations. These ignitions are more likely to start at the base or lower portion of slopes (i.e., roadsides, stream or river corridors, hiking trails, or railway corridors) and often within or adjacent to community structures or neighborhoods. These wildfires are typically suppressed quickly, due to accessibility. However, in recent years it has become exceedingly apparent that in lower slope locations, an ignition can rapidly turn into deadly and/or highly damaging wildfire; far too often experienced in California's growing WUI environment.

TERMINOLOGY TIP

Risk: The likelihood of an event happening.

Wildfire Risk: The chance of fire starting as determined by the presence and activity of causative agents.

NWCG Glossary

Since 1987, about 25.4% of the 3,712,000 total burnable acres in Siskiyou County – or 944,119 acres – have burned, or which lighting fires accounted for 821,219 acres (about 87%). Lightning will remain an uncontrollable fire start element. In Tables 18-20 below, it is obvious the Klamath West and Salmon PR's have been the most impacted by lightning. The data show that humans are also a significant risk for fire starts across the County, especially in the Butte and Shasta Valley PR's.

Wildfire Occurrence and Frequency

Occurrence, frequency and causal factors are all necessary considerations in an area wildfire risk assessment. Acres burned by fire start per 1000 acres is a way to compare each planning area with another, rather, everything is based on a per 1000 acres and not on the total size of the area. Wildfire is present in all Planning Regions. There is an obvious group of planning regions that are heavily impacted by acres burned. This is due to the following reasons, in no particular order of importance:

1. Steep slopes burn hotter and thus tend to produce larger acreages.
2. When significant lightning events occur, Siskiyou County is often not the only county affected. When an extensive lightning event occurs, due to being more sparsely populated, areas of Siskiyou County can be at a disadvantage for firefighting resources that burn simultaneously in other parts of the state or country, especially in highly populated areas.
3. Access issues are typically problematic in the steep, rugged mountains of Siskiyou County. Steep slopes are more difficult for suppression efforts and also present greater work hazards to firefighters.
4. Smoke inversions can make for a difficult challenge as the smoke is problematic to fire fighters, locating new starts are made more difficult, and inversions can present significant large fire growth when they lift.

Table 18 - Acres Burned by Cause by Planning Region

Acres Burned by Cause by Planning Region									
	Butte Valley	**Mid Klamath - East**	**Mid Klamath - West**	**Salmon**	**Scott Valley**	**Shasta Valley**	**Upper Sacramento - East**	**Upper Sacramento - West**	**Grand Total**
Lightning	18,426	121,385	373,078	253,916	45,080	8,305	47	981	821,219
Human	17,749	37,091	7,615	40,424	2,050	16,756	50	1,164	122,900
Grand Total	**36,176**	**158,476**	**380,693**	**294,339**	**47,131**	**25,062**	**98**	**2,145**	**944,119**

Table 19 - Number of Fires by Cause by Planning Region

Number of Fires by Cause by Planning Region									
	Butte Valley	**Mid Klamath - East**	**Mid Klamath - West**	**Salmon**	**Scott Valley**	**Shasta Valley**	**Upper Sacramento - East**	**Upper Sacramento -West**	**Grand Total**
Lightning	67	160	460	485	71	51	2	48	1,344
Human	208	138	171	407	64	448	37	65	1,538
Grand Total	**275**	**298**	**631**	**892**	**135**	**499**	**39**	**113**	**2,882**

Table 20 - Acres Burned and Fire Starts per 1,000 acres by Planning Region

Acres Burned and Fire Starts per 1,000 acres by Planning Region								
	Butte Valley	Mid Klamath - East	Mid Klamath - West	Salmon	Scott Valley	Shasta Valley	Upper Sacramento - East	Upper Sacramento -West
Acres Burned	15	178	229	216	28	12	0.2	1
Fire Starts	0.12	0.34	0.38	0.65	0.08	0.25	0.1	.06

5.3.3 Fuel Rank Output

California's wildfire hazard, depicted as Fuel Rank, sets the stage for this graphic. Tables 21 and 22 categorize the Fuel Rank of each planning region from Low-non-burnable to Very High (data derived from CAL FIRE, Strategic Fire Plan). The data underscore the urgency of undertaking fuels treatment, given that a high absolute acreage and percentage of many of the planning regions have a "Very High" potential for a catastrophic wildfire (FRAP, 2007).

Table 21 - Fuel Rank Categories by Acreage Representation

FUEL RANK BY ACREAGE PER PLANNING REGION					
Planning Region	**Low-Non-Burnable**	**Moderate**	**High**	**Very High**	**Total Result**
Butte Valley	26,785	93,500	93,891	422,191	636,366
Mid Klamath	4,790	209,859	209,347	406,065	830,062
Salmon	2,702	124,001	105,901	216,079	448,683
Scott Valley	8,605	129,115	107,804	269,317	514,841
Shasta Valley	18,067	148,133	69,034	366,749	601,983
Upper Sacramento	4,473	126,135	305,862	260,120	696,590
Totals by Fuel Rank	**65,421**	**830,744**	**891,839**	**1,940,521**	**3,728,524**

Table 22 – Fuel Rank Categories in Percentages

FUEL RANK AS A PERCENTAGE BY PLANNING REGION					
Planning Region	**Low-Non-Burnable**	**Moderate**	**High**	**Very High**	**Total by Region**
Butte Valley	4%	15%	15%	66%	100%
Mid Klamath	1%	25%	25%	49%	100%
Salmon	1%	28%	24%	47%	100%
Scott Valley	2%	25%	21%	52%	100%
Shasta Valley	3%	25%	11%	61%	100%
Upper Sacramento	1%	18%	44%	37%	100%

5.3.4 Fire Threat Output

California's hazard-risk is articulated as Fire Threat, which is a combination of fire frequency (a risk factor) coupled with fire behavior potential (fuel rank). Fire Threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes. Siskiyou County Fire Threat data, derived from the CAL FIRE Strategic Fire Plan and depicted in Table 23, are cause for significant concern, given that in most Planning Regions well over half of the acreage is in the Very High threat category.

Table 23 - Fire Threat Categories by Acreage

WILDLAND FIRE THREAT BY ACREAGE REPRESENTATION PER PLANNING REGION					
Planning Region	**Low-Non-Burnable**	**Moderate**	**High**	**Very High**	**Total by Region**
Butte Valley	26,785	29,797	173,962	405,823	636,366
Mid Klamath	4,790	9,187	241,214	574,871	830,062
Salmon	2,702	6,286	144,400	295,296	448,683
Scott Valley	8,605	22,865	150,645	332,726	514,841
Shasta Valley	18,067	99,297	203,965	281,054	601,983
Upper Sacramento	4,473	33,493	139,031	519,593	696,590
Totals by Rank	**65,421**	**200,924**	**1,052,816**	**2,409,363**	**3,728,524**

Table 24 - Fire Threat Categories in Percentages

WILDLAND FIRE THREAT AS A PERCENTAGE BY PLANNING REGION					
Planning Region	**Low to Non-Burnable**	**Moderate**	**High**	**Very High**	**Total Result**
Butte Valley	4%	5%	27%	64%	100%
Mid Klamath	1%	1%	29%	69%	100%
Salmon	1%	1%	32%	66%	100%
Scott Valley	2%	4%	29%	65%	100%
Shasta Valley	3%	16%	34%	47%	100%
Upper Sacramento	1%	5%	20%	66%	100%

5.4 STRUCTURAL VULNERABILITY

NOTE

This section of the wildfire assessment provides the context and science regarding structure vulnerability (ignition exposure factors). *Section 6.2.2* of the Action Plan will specify actions needed to reduce this vulnerability or ignitability.

Structure vulnerability is a key component of a CWPP and a requirement in the assessment process. Ironically, the 2017 and 2018 fire seasons, and in particular the Camp fire that resulted in the almost total loss of the town of Paradise, reinforces the fact that structure vulnerability to wildfire exacerbated the high loss of homes and businesses. It is not the flames or radiant heat that cause a vast loss of homes but rather the susceptibility of structures to receiving embers and initiating fires on or immediately adjacent to homes (St. John, Los Angeles Times, Dec 2018.) Wildfire structure research by (now retired) Jack Cohen, has underscored the overwhelming evidence that the structures themselves need to be "hardened" or made more resilient to fire spread and subsequent loss from wildfire. All the fuels treatment in the world will not arrest the advance of wildfires under severe conditions, like those experienced during the Boles fire in Weed in 2014 or the Klamathon fire that destroyed structures in Hornbook in 2018. As Cohen notes, "it is the work on or around a structure and the immediate environs to homes, where success can be gained or lost" (i.e., whether a home will survive a wildfire event or not).

It remains imperative that homeowners themselves must take precautions in the structural components of their home, mitigating hazards on the home such as cleaning eves or removing firewood immediately adjacent to the home, and completing the annual work required within the 30 feet and 100 feet as required by law. If we choose to live in the WUI, we all must take responsibility to protect our homes.

From 2010 - 2016, an estimated average of approximately 3,300 structures per year were lost due to wildfires across the United States, with more than half of those losses as primary residences. In California alone, the sharp rise in structure loss figures during 2017-18 was notably alarming, with estimates of over 12,300 destroyed in 2017 and approximately 22,800 in 2018 (National Interagency Coordination Center, 2019).

Research has shown repeatedly that the main reason for structure loss during a wildfire is due to the ignitability of the structure itself and it is not always the large, high intensity fires that destroy or damage structures. Low intensity fires can destroy structures that are highly ignitable while structures with low ignitibility can survive high intensity fires (Cohen, 2000).

Wildfires can ignite structures in numerous pathways. These pathways depend on a variety of characteristics found in the WUI. Examples include:

- Adjacent wildland open space – fuels, terrain, weather, and a fire's influence on itself.
- Community – housing density, zoning, separation distance, and physical barriers.

- Structure – exterior structure construction material, structure design, site location (e.g., mid-slope, hilltop), structure maintenance, and heat sources (e.g., landscaping, flammable exposures within 100-200 feet).

The risk of a structure's ignition is a direct result of exposure by wildfire from radiation, convection, and/or burning embers and the vulnerability or ignitability of the structure. Structures ignite in three ways:

- Convection - the transfer of heat by the movement of rising hot air or gasses. Convective heat tends to rise and is visually observed as flames and smoke columns. Convection lifts firebrands into the sky. Flames can overwhelm a structure by direct flame impingement, which could be a result of inadequate spacing of structures, lack of defensible space, and/or extreme fire behavior.

- Radiation - heat energy released in all directions from a burning object. Exposed flammable structural elements reach their ignition temperature causing a structure to ignite. Nearby burning structures can ignite other structures in close proximity moving the fire from structure to structure. The potential for ignition is greatly reduced as space between structures and fuel (wildland and urban) is increased.

- Burning Embers - flammable material (e.g., wood shingles, tree bark, leaves) that detach from the main fire front and get carried by strong convection drafts and/or winds to receptive fuel downwind. Wildfires can produce hundreds to thousands of burning embers that can be carried very long distances by winds.

Much of Siskiyou County is vulnerable to wildfires due to proximity to wildland vegetation and to the steep slopes in the mountainous regions, or the famously high winds through the valley and canyons.

DEFENSIBLE SPACE

Defensible space is the space between a structure and the wildland area or neighboring structures that, under normal conditions, creates a sufficient buffer that modifies the spread of a wildfire to a structure. Defensible space can protect a structure from direct flame impingement, radiant heat, and reduce the number of burning embers; it is essential for structure survivability during wildfires.

Enclaves, islands, and riparian corridors of wildland vegetation, ornamental vegetation, and/or native tree woodlands are interspersed with structures and subdivisions throughout the County. These create significant opportunities for wildfires to ignite, establish, and destroy structures. Listed below are vulnerable parts of a structure that contribute to ignition during a wildfire (see *Section 6.2.2* for specific actions to mitigate these vulnerabilities).

- Roofing - Roof construction and maintenance has been a key factor in structure loss on many fires. It is not just the type of roofing material, but also the design, construction details, the condition of the material, and whether the roof is clear of burnable material (e.g., pine needles and other debris).

- Garages - Garages with gaps at the top, bottom and edges of doors allow firebrands to enter. Oftentimes garages contain flammable materials that can enhance ignition potential. Garages usually have vents at various locations, especially if they contain gas furnaces or hot water heaters. These vents can be easy entry points for embers.
- Siding - Flammable siding can provide a pathway for flames to reach vulnerable portions of a structure, such as the eaves or windows. Siding needs a source of ignition, which in many cases includes vegetation, wooden decks, and fences, or stacked firewood or other flammable material in close proximity to a structure. This can provide a heat source that can ignite siding.
- Vents - Soffit vents in the eaves are an easy entry point for wind-driven burning embers during a wildfire. Attic fires are not easily detected from the outside and structures have been lost when fire personnel have left the scene unaware that a fire has ignited within the attic.
- Windows - Unprotected and inadequate windows can be another major entry point for fire. Windows broken by airborne materials or cracked by thermal expansion during a wildfire ignite materials in the structure through radiation, convection, and/or firebrands.
- Nooks and crannies - Little grooves, inside corners, and roof valleys all become areas where flammable debris (e.g., pine needles, bird's nests) have collected over time. Burning embers can land on this debris, igniting it.
- Crawlspace Vents - If not adequately screened, these areas, not just under a structure but also under decks and other attachments, are difficult to protect. Much like vents in the attic, firebrands enter these areas and flammable material underneath a structure can ignite.
- Wood Fences - Firefighters have observed that fences act as a fuel source that can carry fire to a structure. Fences when attached to homes present a threat to the structure.
- Wood Decks - Decks act as a source of fuel that is attached or directly adjacent to structures. When ignited by wildfire the radiant and convective heat output can ignite structures. In addition, most decks are adjacent to large windows or glass sliders and the heat from a deck fire can cause the glass to fail allowing the wildfire to enter a structure.
- Flammable landscape vegetation and/or debris - Landscaping and flammable items such as firewood or flammable debris piled in close proximity to the house can provide an ignition source for multiple portions of the structure. As a result, structures are more susceptible to ignition when exposed to significant radiant and convective heat from burning material.

SECTION 6. ACTION PLAN GUIDANCE

6.1 COMMUNITY PREPAREDNESS

A challenge for Siskiyou County communities is how to generate interest and maximize awareness of the wildfire threat and to encourage participation in preparedness activities that effect change at the individual and community level. Communication is equally important in the community preparedness challenge. Citizens need to know where to obtain accurate information before an event escalates.

Preparedness for inevitable wildfire events includes a range of activities including community education, protection of values and reducing structure ignitibility, a comprehensive fuels mitigation strategy, and evacuation preparedness. The following preparedness programs and communication tools are available and utilized countywide.

NOTE

Individual communities often have area specific preparedness tools and training.

6.1.1 Wildfire Preparedness

Ready! Set! Go! Program - National

Ready, Set, Go! (RSG) is a program managed by the International Association of Fire Chiefs (IAFC) that seeks to develop and improve the dialogue between fire departments and the residents they serve. Any department from any state can join the program. Launched nationally in March 2011 at the WUI 2011 conference, the program helps fire departments to teach individuals who live in high risk wildfire areas – and the wildland-urban interface – how to best prepare themselves and their properties against fire threats. The RSG National Action Guide is available here:

http://www.wildlandfirersg.org/Portals/18/Resources/Resources/EAG%20v8.pdf

Ready for Wildfire - California

CAL FIRE has incorporated the RSG methodology into a set of resources available at http://www.readyforwildfire.org/. This program is applicable statewide and includes information for defensible space, home hardening, preparing families, and checklists to help residents.

Tools and information are available through fire and resource agency websites, FSC websites, and social media pages.

These resources are particularly useful for public understanding and consumption. For example, the visionary "One Less Spark – One Less Wildfire" campaign developed an action-based program that highlights the fact that approximately 95% of all wildfires in California are caused by people and establishes why fire agencies need the public's help to prevent them. Whether it is ensuring a campfire or landscape debris burn of leaves and branches is completely extinguished, or keeping a vehicle well maintained to prevent sparks, following just a few simple steps can help prevent wildfires.

http://www.preventwildfireca.org/OneLessSpark/

Firewise

Firewise is another national level program that teaches people how to adapt to living with wildfire and encourages neighbors to work together and take actions now to prevent future losses. Research establishes that a majority of homes ignite during a wildfire as a result of embers or small flames. There are steps that homeowners can take to reduce the risk, with the most important efforts occurring on and immediately around the home. Learn what actions you can take to reduce your risk of loss.

https://www.nfpa.org/Public-Education/By-topic/Wildfire/Firewise-USA

Fire Safe Council of Siskiyou County (FSCSC)

The Fire Safe Council of Siskiyou County is a non-profit community organization formed in 2003 that provides support for wildfire information, education, preparation and planning activities, community fuels/vegetation management projects, fund raising, and neighborhood assistance. FSCSC provides hands-on guidance and assistance to any community interested in pre-fire planning and project implementation activities. They meet on a regular basis and coordinate with local community FSCs. (See Section 1.3.2 and https://firesafesiskiyou.com/ for further information).

Fire Danger Ratings

The agencies provide daily updates on their website to inform residents, visitors and businesses of the fire danger rating forecasts so they can modify their outdoor activities to help reduce the threat of wildfire ignitions. These ratings and brief explanation are available at: https://www.fs.usda.gov/detail/okawen/alerts-notices/?cid=fseprd586978.

Signage

The suppression agencies have an active signage program to educate and communicate fire prevention messages to the public, especially in high fire danger recreation areas and associated roadways commonly traveled during summer, high-visitor use season. Federal and state fire and resource management agencies post fire danger rating signs and update this information on a daily basis. The agencies that steward trail systems and campgrounds also posts fire danger and restriction information at local trailheads and high-use areas. This action helps to educate recreationists and mitigate the risk of negligent wildfire ignitions.

Example of fire danger rating signage

6.1.2 Area Notification Systems

Code RED Emergency Alert System

Siskiyou County has instituted a rapid emergency notification service called CodeRED. CodeRED is an emergency notification service by which public safety authorities can notify residents and businesses by telephone or cellular phone about emergency situations. The system is capable of sending messages only to specific neighborhoods or to the entire community. The system distributes emergency messages via telephone to targeted areas or the entire county at a rate of 1,000 calls per minute. CodeRED employs a one-of-a-kind Internet mapping capability for geographic targeting of calls, coupled with a high-speed telephone calling system capable of delivering customized pre-recorded emergency messages directly to homes and businesses, live individuals and answering machines. https://www.co.siskiyou.ca.us/content/codered-emergency-alert-system

The Siskiyou County website has instructions for registering with CodeRED system by simply clicking on the CodeRED logo:

This brings up the registration form: https://public.coderedweb.com/CNE/en-US/6F327CCDFFFD

Additionally, there is the option and link/icon provided for downloading the CodeRed mobile alert app: https://www.onsolve.com/landing/codered-mobile-alert-app/

Integrated Public Alert Warning System (IPAWS)

As a relatively new nationwide FEMA alert program, IPAWS is a modernization and integration of the nation's alert and warning infrastructure, and will save time when time matters most, protecting life and property. IPAWS provides public safety officials with an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface. In Siskiyou County, IPAWS is integrated with the CodeRed system and utilized for all emergency alerts. In 2019 there will be testing of the integrated system conducted twice a year. (Siskiyou County OES, 2019)
https://www.fema.gov/integrated-public-alert-warning-system

Social Network Programs

There are multiple social network avenues for acquiring information on emergent wildfire and/or evacuation situations. Facebook is more widely utilized amongst the many departments, agencies and entities actively involved in Siskiyou County. These networks are commonly referenced to keep citizens and interested parties up to date on events, advisories, and alerts. Primary entities with helpful Facebook page notifications include:

- Siskiyou County Scanner: https://www.facebook.com/groups/388137084675936/
- Siskiyou Alerts (Fire and Emergency): https://www.facebook.com/groups/SiskiyouAlerts/
- Siskiyou County Fire Chiefs Association: https://www.facebook.com/SiskiyouFireChiefs/

- Fire Safe Council of Siskiyou County: https://www.facebook.com/Fire-Safe-Council-of-Siskiyou-County-139092569484279/
  - Reconstructing their website: https://firesafesiskiyou.com/
- Siskiyou County Sheriff: https://www.facebook.com/SiskiyouCountySheriff/
- CAL FIRE Siskiyou Unit: https://www.facebook.com/CALFIRESKU/
- Klamath National Forest: https://www.facebook.com/KlamathNF/
- Shasta Trinity National Forest: https://www.facebook.com/ShastaTrinityNF/

Radio Stations and Communication Broadcast Systems

For AM band emergency radio it is important to understand that most home stereo systems do not pick up AM radio broadcasts from low power stations. To hear emergency broadcasts on AM, individuals should listen to them on a battery powered portable radio or your car radio. FM stations also broadcast emergency events but are limited to more localized vicinities. During an emergency across the County, all radio networks (AM & FM) will generally broadcast out with notable alert tones (Emergency Broadcast System) and provide critical information including further contact sources such as a specific agency website, social network site or phone number.

Live scanner applications and electronic broadcasting is another commonly utilized emergency communication sources accessed via computer or mobile device. The scanner tools offer the public the ability to listen to emergency responder dialog in an evolving event. It is important to understand that the scanner tool is one-way communication, a person cannot to talk/transmit out to others.

National Oceanic and Atmospheric Administration (NOAA) also has an alert radio broadcast system in place. Their Emergency Alert System (EAS) covers multiple extreme weather conditions and a number of non-weather-related events, including wildfire.

The following list and web links include helpful source information for area radio and communication broadcast systems:

- AM-1610: Utilized for Highway Emergency situations
- NOAA: Emergency Alert System coverage and code information
  - Coverage map and transmission information: http://www.nws.noaa.gov/nwr/coverage/site2.php?State=CA&Site=WWF97#TransmitterDetails
  - Code information: http://www.nws.noaa.gov/nwr/info/eventcodes.html
- Radio Stations (can query by specific location): https://radio-locator.com/cgi-bin/locate?select=city&city=Yreka&state=CA
- Example scanner tools/applications:
  - Broadcastify: https://www.broadcastify.com/listen/ctid/229

- Scanner Radio – Fire and Police: https://play.google.com/store/apps/details?id=com.scannerradio&hl=en_US

Other Media Outlets

Local media including television and newsprint have provisions for email and/or text messaging contact information and are notified as soon as possible on all emergency events. They have also been provided with contact information for wildfire event Public Information Officers as well. Contact information here includes primary newspapers with countywide, multiple community coverage and TV stations providing coverage of emergency events.

- Siskiyou Daily News

  http://www.siskiyoudaily.com/
  https://www.facebook.com/siskiyoudailynews/

- Mount Shasta Area Newspapers

  http://www.mtshastanews.com/
  https://www.facebook.com/mtshastanews/

- KRCR News Channel 7 (ABC) – Redding

  https://krcrtv.com/
  https://www.facebook.com/KRCR7/

- KDRV Newswatch 12 (ABC) - Medford

  http://www.kdrv.com/home/
  https://www.facebook.com/KDRV12/

- KOBI-5 News (NBC) - Medford, Klamath Falls

  https://kobi5.com/
  https://www.facebook.com/kobitv/

- KTVL News Channel 10 (CBS) - Medford

  https://ktvl.com/

6.1.3 Emergency Services

At the onset of an emergency, the level of response for first responders and resources is determined by interagency dispatchers communicating with a reporting party. The dispatchers are trained to follow concise guidelines stated in interagency agreements and guides. In many cases, an initial wildfire response will draw from the local community's interagency emergency responders. If the event escalates more resources will respond from adjacent communities then adjacent counties and if the increase in size or complexity continues, additional national level resources will respond.

Like many counties in California, Siskiyou County does not employ their own 'fire department'. Wildfire emergency resources for suppression and pre-suppression activities are supported through cooperative interagency fire agreements. The County does have an 'Emergency Services' department. Access to this Emergency Services information can be found on the County website located under 'Health & Human Services' department.

Siskiyou County Office of Emergency Services (OES)

Mission statement: Siskiyou County Office of Emergency Services (OES) is committed to the protection of lives, health, and property of Siskiyou County residents when disaster strikes. OES strives to accomplish this goal by maintaining a state of readiness utilizing the four phases of emergency management: Preparedness, Response, Recovery, and Mitigation.

There are two positions, a Director and Deputy Director. In a wildfire emergency, they provide a coordination role assisting in emergency planning and organization among the multiple emergency response agencies and entities throughout the County. OES has a countywide Multi-Hazard Mitigation Plan (HMP) in place (and is currently being updated). It addresses natural disasters, technological incidents, and national security emergencies within the Siskiyou County area. The HMP addresses the operational concepts that reflect potential large-scale disasters which generate unique situations requiring unusual emergency responses. A copy of the updated county HMP will be available on their website at:

https://www.co.siskiyou.ca.us/content/office-of-emergency-services

American Red Cross of Gold Country Region

The Gold Country Region consists of two chapters, the Northeastern California Chapter and the Sierra-Delta Chapter. The Northeastern Chapter covers 14 counties, and the Sierra-Delta covers 10 counties; together serving 4.4 million residents across a span of 48,327 miles. The twenty-four counties include: Alpine, Amador, Butte, Calaveras, Colusa, El Dorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Sierra, Siskiyou, Stanislaus, Sutter, Tehama, Trinity, Tuolumne, Yolo, and Yuba counties.

The Gold Country Region seeks to help people prevent, prepare for, and respond to natural and human-caused disasters through the immediate mobilization of people and resources and the provision of community, workplace, and school-based training. In addition to disaster relief, the Region delivers Community-Disaster Education, First Aid/CPR, and other types of life-saving health & safety training to thousands of people across our region to help people prevent, prepare, and respond to emergencies.

A Red Cross website provides information and tools to assist in emergency and disaster relief preparation. https://www.redcross.org/local/california/gold-country.html
They also have information via social media (@ARCGoldCountry).

American Red Cross Office Contact Information

- Local/Siskiyou: 1000 S. Main St., Yreka CA. 96097; 530-842-4476
- Regional/Headquarters: 1565 Exposition Blvd., Sacramento CA. 95815; 916-993-7070

Community Emergency Response Teams (CERT)

Another link on Siskiyou County OES website is to the Federal Emergency Management Agency (FEMA) Community Emergency Response Team (CERT) program. This program educates volunteers about disaster preparedness for the hazards that may affect their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations.

Since 1993, CERT has enabled communities across the country, building skills and capabilities to prepare for and respond to any disaster. There are now CERT programs in all 50 states, including many tribal nations and U.S. territories; each unique to its community but all essential to building a Culture of Preparedness.

The CERT program was designed as a grassroots initiative and specifically structured so that the local and state program managers have the flexibility to form their programs in the way that best suits their communities. CERT volunteers are trained to respond safely, responsibly, and effectively to emergency situations, as well as support their communities during non-emergency events. There are over 2,700 local CERT programs nationwide, with more than 600,000 individuals trained since CERT became a national program.

FEMA's Community Emergency Response Team Program trains volunteers to prepare for the types of disasters that their community may face. The hands-on practice and realistic exercises provided in the CERT program helps members:

- Learn how to safely respond to manmade and natural hazards
- Organize basic disaster response
- Promote preparedness by hosting and participating in community events

Please contact your local emergency manager; county level OES representatives, Jason Vela or Sally Collard or FEMA at FEMA-Prepare@fema.dhs.gov

Animal Disaster Evacuation

Siskiyou County Hi 4-H has developed a user-friendly brochure to assist resident pet-owners prepare for their animal safety during an emergency situation. They emphasize the importance of making a plan before an emergency, stating that this preplanning will help in a crisis. Their advice: Local agencies have limited resources, so you need to ready yourself to safely evacuate your animals. The brochure link (to be updated in near future) is found on the County OES website
https://www.co.siskiyou.ca.us/sites/default/files/docs/AGD-20180629_PEEP_Brochure.pdf

6.2 PROTECTING VALUES

This section describes specific actions to enhance protection of the County's principal values (identified in Section 2.2). These actions should be addressed and elaborated upon in local level CWPP's and revisited collaboratively on a regular basis.

6.2.1 Life Safety

Siskiyou County's top priority is life safety with the protection of property (e.g., homes, businesses, historic sites, infrastructure, etc.) as the second priority. When an emerging wildfire event threatens the WUI, there is an immediate trigger in the level of urgency amongst emergency responders. This elevated response directly correlates to imminent danger posed to human lives in the vicinity or path of the wildfire.

Fighting wildfires combined with protecting life and structures is extremely complex and dangerous. When a wildland fire event moves into the WUI, it is undeniably unsafe and/or impossible for property-owners to protect their property. In many cases, given the severity of these wildfire situations, trained firefighting forces cannot make a safe, effective stand to protect structures. Therefore, structures and other values need the element of resilience that may allow them to survive on their own. The devastating 2017-2018 WUI fire disasters strongly illustrate the profound reasoning of the wildfire interagency message stating that property-owners should definitely evacuate when directed to do so.

There are many factors that affect the ability of firefighters to protect structures and other improvements. Firefighting forces responding to an incident begin an assessment or "triage" as they approach the scene. This initial triage consists of quick, concise decisions that determine critical safety factors to manage or mitigate the level of risk for safe engagement in suppression actions. Elements essential to firefighters' safety in WUI scene operations include; adequate route clearance (hazard fuels and power lines) for access and egress, structure/improvement characteristics ('vulnerability' issues), hazardous material issues, adequate water sources, adequate defensible space, and whether the defensible space provides them safe operational space. The required 100-feet minimum defensible space may not be sufficient for firefighters to engage in structure defense safely; a fact clearly experienced in the severe WUI wildfire events of northern California during 2015-2018 fire seasons.

Both firefighters and community citizens should learn the importance of Safe Separation Distance (SSD) guidelines to understand survival in a wildfire environment. Through wildland fire research and field experience, Safety Zone guidance became an operational tool on the fireground, utilized by all wildfire suppression personnel to strengthen firefighter safety, beginning in approximately 1957. SSD employs these safety zone concepts to enhance safe access and operational space for firefighters and property-owners and includes added elements relevant to WUI. Although these guidelines are still being studied and 'field tested', it is clearly understood that the added flammability & heat index elements of burning structures, onsite utilities, combustibles and other non-native fuels *significantly increases* fire intensities that can threaten the life safety of firefighters and property-owners.

Recently updated safety zones guidelines calculate the Safe Separation Distance (SSD) between a wildfire and firefighters based on the height of the vegetation. In order to determine the SSD, using the table below, firefighters can multiply the constant number eight (8) times a slope/wind factor times the height of the vegetation (see Table 25). An example is a 15 mph wind with a 24 percent slope, and 6-foot tall vegetation equals an SSD of 144 feet (8x3x6=144 feet), which is greater than the minimum defensible space standard of 100 feet (Butler, 2014).

NOTE

Wildland fire tools and applications for education or field use should be utilized or administered by a person with proper training, experience and certification. SSD can be utilized as a guide for understanding fire intensities and learning safety distances.

Table 25 - Preliminary Proposed Safety Zone Rule (July 2014)*

New Preliminary Proposed Safety Zone Rule (July 2014)			
Calculating a Safe Separation Distance (SSD) SSD = 8 * Slope wind Factor * Height of the surrounding vegetation			
SLOPE-WIND FACTOR			
Wind Speed	Flat 0% Slope	20% Slope	>30% Slope
Light 0-10 mph	1	2	3
Moderate 11-20 mph	2	3	5
Strong > 20 mph	3	5	6

**Disclaimer*: This proposed safety zone rule should be considered preliminary. It is based on limited data and analysis and is subject to increased or decreased spacing based on additional factors. It was presented for release in 2014 with the intent of increasing firefighter safety and reducing risk of injury. There have been no updates to these guidelines for 2015 and beyond.*

6.2.2 Reducing Structure Ignitability

There simply are not enough fire engines or fire personnel to protect every structure in Siskiyou County. Many WUI area residences throughout the County are not safe for firefighters to engage in structure protection. Home and property owners are responsible for safe clearance *before* a wildfire occurrence. Whether a structure survives a wildfire often depends on the structure's susceptibility to ignite even in the absence of firefighter protection. Structures in the WUI need to maintain a resilience that will withstand estimated wildfire effects given the surrounding environment and be able to stand on their own.

Most actions to reduce the ignition potential of a structure are associated directly with the structure itself and within 100-200 feet distance from the structure. Under some circumstances, reducing fire intensity for life safety will involve extending beyond 200 foot depending on the location of the structure on the terrain including steepness of the slope, high wind events such as Foehn winds, vegetation density, and fire behavior.

IMPORTANT NOTE

The primary responsibility of ensuring that a structure can withstand wildfire lies with the property-owner.

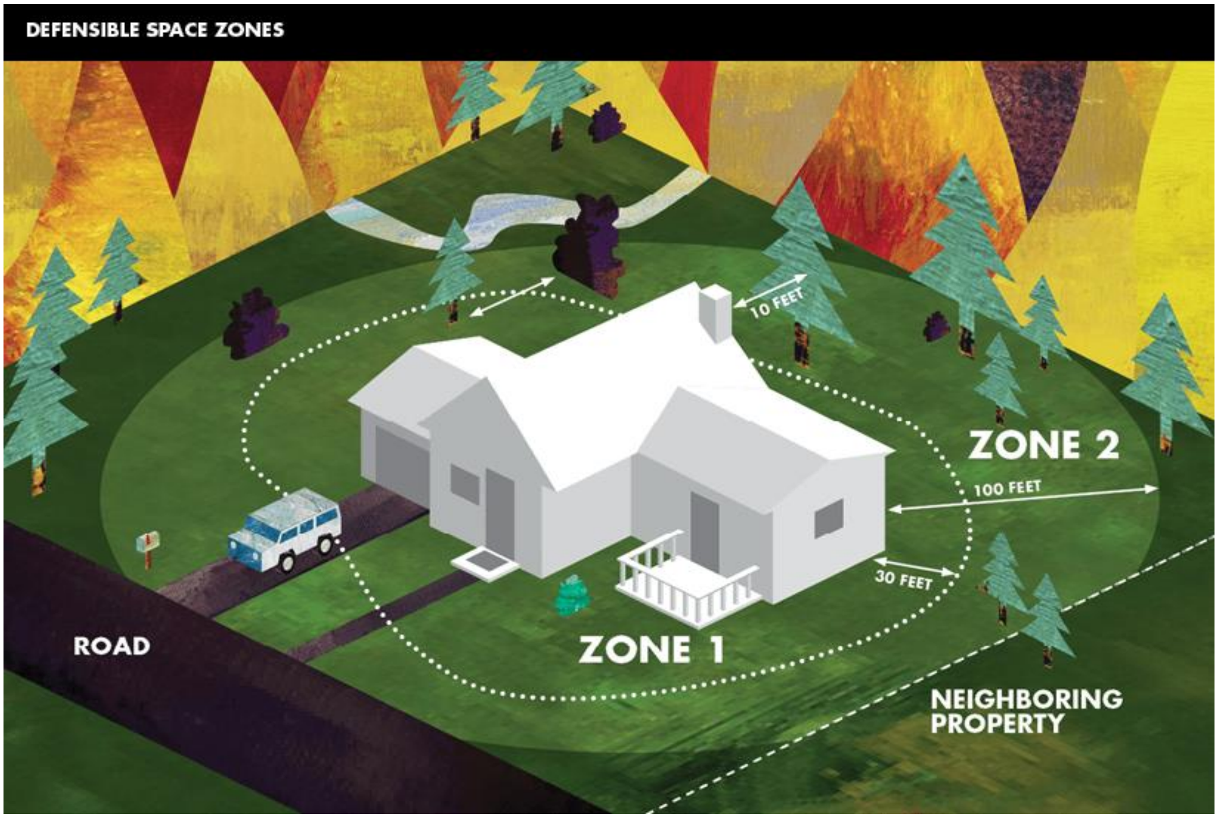
When discussing structure ignitability, composition and defensible space are equally important factors. There are multiple sources providing homeowner specifications and guidance for strategy and mitigation actions. In Siskiyou County structures in SRA lands must adhere to defensible space guidance provided in PRC 4291 specifications. CAL FIRE conducts annual home owner inspections using a form called the LE-100, that will enforce these parameters. These guidelines can also be utilized in LRA/city boundary. A similar home protection guidance tool termed 'Home Ignition Zone' (HIZ) is facilitated by 'Firewise.org' and sponsored by the National Fire Protection Association (NFPA 2015). There is overlap in these tools and with both having helpful information.

Defensible Space Law (PRC 4291):
http://www.readyforwildfire.org/Defensible-Space/

Keep your property lean and green to help protect your family and home.
Creating defensible space is essential to improve your home's chance of surviving a wildfire. It's the buffer you create between a building on your property and the grass, trees, shrubs, or any wildland area that surround it. This space is needed to slow or stop the spread of wildfire and it protects your home from catching fire—either from direct flame contact or radiant heat. Defensible space is also important for the protection of the firefighters defending your home.

Defensible Space Zones
Two zones make up the required 100 feet of defensible space. Figure 24 depicts the two-zone concept with descriptions following the graphic.

Figure 24 - Defensible Space Zones (PRC 4291)



Zone 1

Zone 1 extends 30 feet* out from buildings, structures, decks, etc.

- Remove all dead plants, grass and weeds (vegetation).
- Remove dead or dry leaves and pine needles from your yard, roof and rain gutters.
- Trim trees regularly to keep branches a minimum of 10 feet from other trees.
- Remove branches that hang over your roof and keep dead branches 10 feet away from your chimney.
- Relocate wood piles into Zone 2.
- Remove or prune flammable plants and shrubs near windows.
- Remove vegetation and items that could catch fire from around and under decks.
- Create a separation between trees, shrubs and items that could catch fire, such as patio furniture, wood piles, swing sets, etc.

Zone 2

Zone 2 extends 100 feet out from buildings, structures, decks, etc.

- Cut or mow annual grass down to a maximum height of 4 inches.
- Create horizontal spacing between shrubs and trees. (See diagram)
- Create vertical spacing between grass, shrubs and trees. (See diagram)
- Remove fallen leaves, needles, twigs, bark, cones, and small branches. However, they may be permitted to a depth of 3 inches.

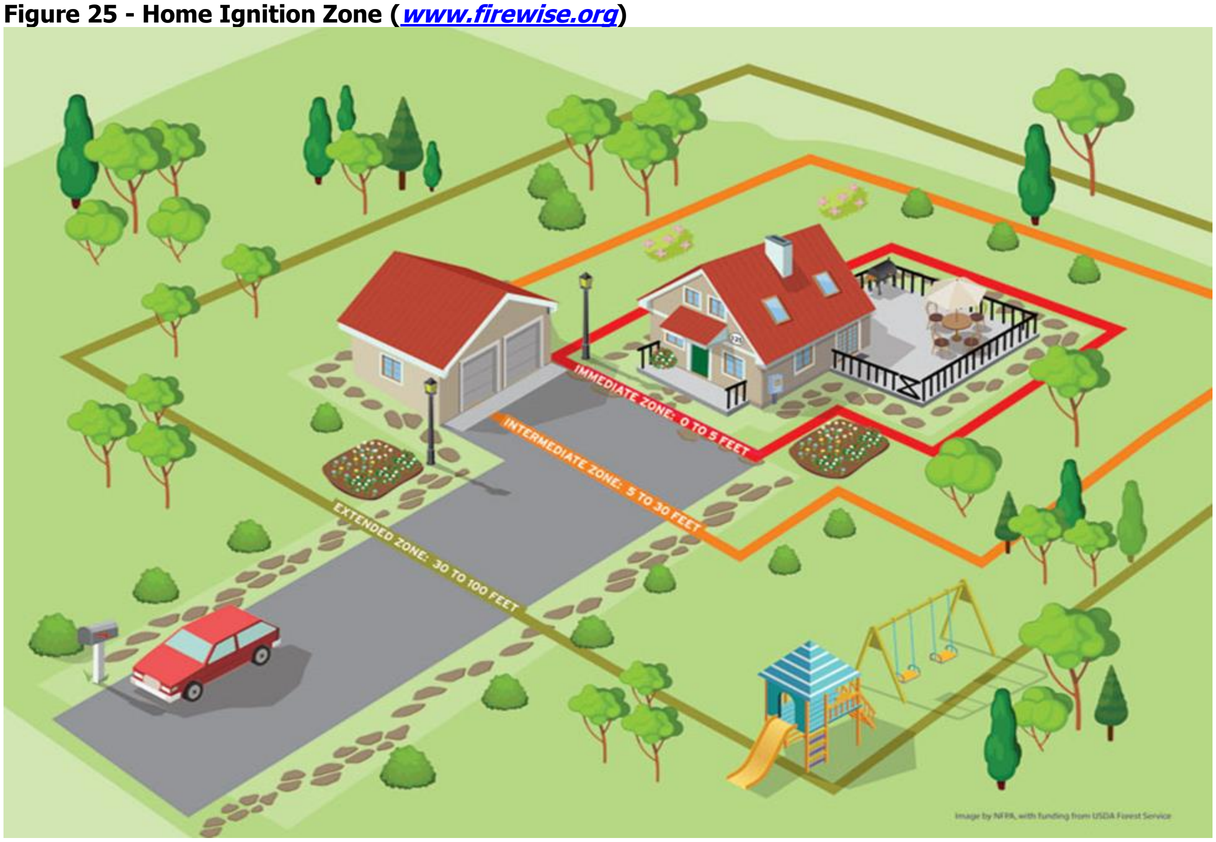
Home Ignition Zone (HIZ) (NFPA 2015)

https://www.nfpa.org/Public-Education/By-topic/Wildfire/Preparing-homes-for-wildfire

The concept of the home ignition zone was developed by retired USDA Forest Service fire scientist Jack Cohen in the late 1990s, following some breakthrough experimental research into how homes ignite due to the effects of radiant heat. The HIZ is divided into three zones. The primary responsibility for protecting a structure lies with the property-owner and is the area within the Home Ignition Zone (HIZ).

The HIZ includes the structure and everything from the foundation out 100 – 200 feet depending on fire behavior conditions (NFPA, 2015). Within this 200-foot area, there are three zones, depicted in Figure 25 with descriptions following the graphic.

Figure 25 - Home Ignition Zone (*www.firewise.org*)



Zone 1 encompasses the structure and all its attachments (e.g., wooden decks, fences, and patios) for at least 30 feet on all sides. In this area:

- Ornamental and wildland vegetation should be carefully spaced, low growing, well-watered, and free of resins, oils and waxes that burn easily.
- Mow regularly and prune trees up six to ten feet from the ground.
- Create space between tree crowns and trim back any trees that overhang the house.
- Create a 'fire-free' area within five feet of the home, using non-flammable landscaping materials and/or high-moisture-content annuals and perennials.
- Remove dead vegetation from under deck, flammable piles, and within 10 feet of house.
- Consider fire-resistant material for patio furniture, etc.

- Remove firewood and/or stacks or piles of flammable material; they should not be located in this zone.
- Water vegetation and mulch regularly.
- Consider xeric landscaping.

Zone 2 is 30 to 100 feet from the home, and vegetation in this zone should be low growing, well irrigated and less flammable. In this area:

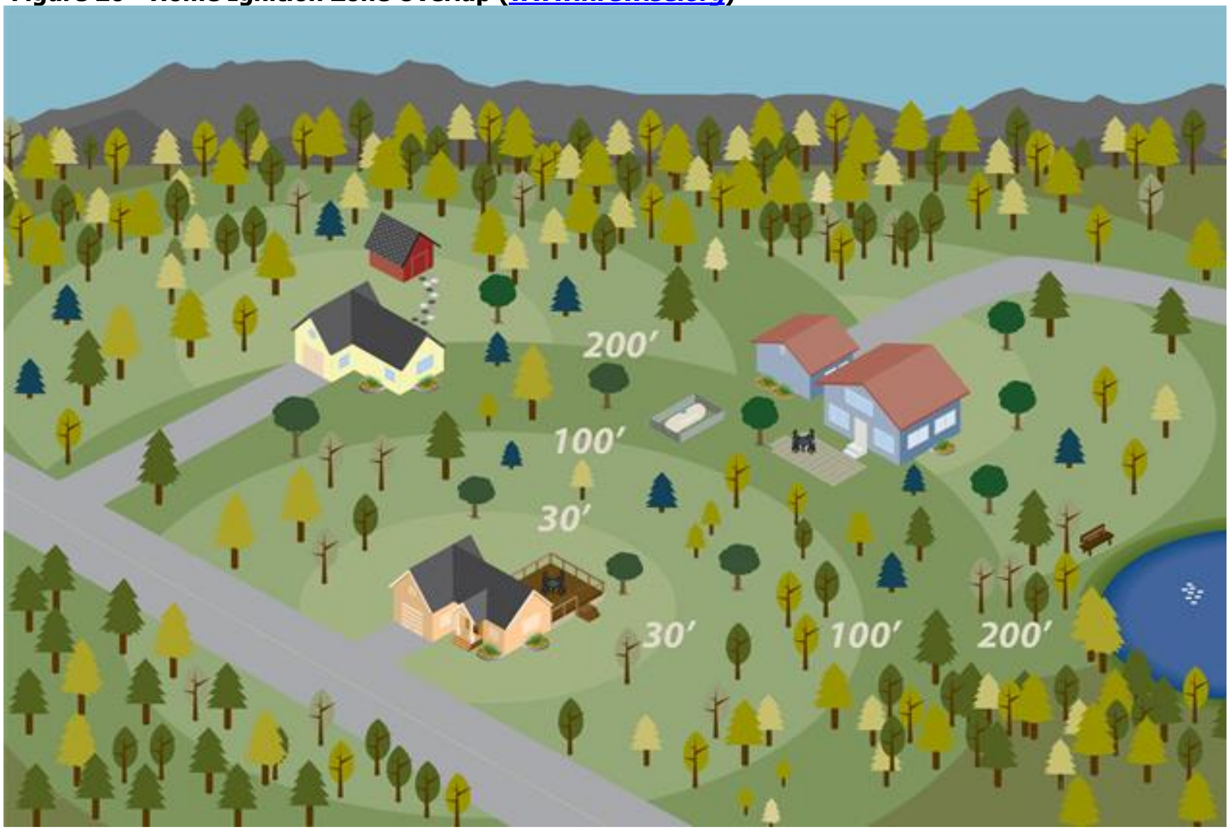
- Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
- Encourage a mixture of deciduous and coniferous trees.
- Create breaks in vegetation, such as driveways, gravel walkways and lawns.
- Prune trees up six to ten feet from the ground.

Zone 3 is 100 to 200 feet from the home. Thinning in this area should occur, although less thinning is required than in Zone 2. In this area:

- Thin vegetation and remove heavy accumulation of combustible growth, ground litter, and debris.
- Reduce the density of tall trees so canopies are not touching.

Mitigating risks within the HIZ is important and requires a joint effort if a neighbor's residence is closer than the full 200' area. Figure 26 below depicts neighboring homes with an overlapping HIZ. Whether these property-owners properly maintain their HIZ, their activities or lack of activity can influence the survivability of a neighbor's home. Tight subdivisions that have homes built within 100-200' of each can cause an overlap issue. Risk reduction efforts by all neighbors in these areas are beneficial to multiple properties.

Figure 26 - Home Ignition Zone Overlap (*www.firewise.org*)



The Defensible Space and Home Ignition Zone concepts, when applied to other improvements in the community, can enhance their survivability as well. Table 26 below summarizes the mitigation actions that will improve protection of life safety and enhance the survivability of structures in the community.

Table 26 - Structure Mitigation Action Guidance

Structure Components	Mitigation Actions*
Defensible Space (Law)	Siskiyou County and California law require 100 feet of defensible space from all sides of any structure; more space is advised in adverse circumstances. Follow PRC 4291 specifications and HIZ recommendations. See Tables 29-30 below for prescriptive guidelines. Select fire resistant plants and non-combustible hardscape for the landscaping. Keep plants located within this area healthy, pruned, and maintained frequently.
Addressing	Address identification shall be Arabic numbers or alphabetical letters and be a minimum 4 inches letter height, contrasting with the background.
Roof	Replace wood-shake or shingle roofs with a Class-A – suitable for extreme fire exposure. Plug openings in roofing materials, such as the open ends of barrel tiles, to prevent ember entry and debris accumulation. Regardless of roof type, keep it free of, fallen leaves, needles and branches and debris.
Chimneys	Screen chimney and stovepipe openings with an approved spark arrestor cap (utilize 1/2-inch screen). Close damper, fire screens, glass doors when wildfire is approaching.

Eaves and Soffits	Cover the underside of the eaves with a soffit, or box in the eaves, which will reduce the ember threat. Enclose eaves with fiber cement board or 5/8-inch thick, high-grade plywood. If enclosing the eaves is not possible, fill gaps under open eaves with caulk. Inspect and maintain eve and soffit vents by covering them with a 1/8" metal mesh screening.
Exterior Siding	Noncombustible siding materials (e.g., stucco, brick, cement board and steel) are better choices. If using noncombustible siding materials is not feasible, keep siding in good condition and replace materials in poor condition.
Windows and Skylights	Single-pane windows and large windows are particularly vulnerable in older homes built prior to current fire codes. Recommend installing windows that are at least double-glazed and that utilize tempered glass for the exterior pane. The type of window frame (e.g., wood, aluminum or vinyl) is not as critical; however, vinyl frames can melt in extreme heat and should have metal reinforcements. Keep skylights free of leaves and other debris, remove overhanging branches; glass is a better option than plastic.
Vents	All vent openings should be covered with 1/8-inch or smaller wire mesh. Another option is to install ember-resistant vents. Do not permanently cover vents, as they play a critical role in preventing wood rot. In the WUI, roof gutters shall be provided with the means to prevent accumulation of leaves, needles, and debris.
Rain Gutters	Always keep rain gutters free of leaves, needles, and other debris. Metal gutters do not ignite, but any debris can. Vinyl gutters can ignite when debris is ignited. Check and clean them several times during the year.
Decks	Keep all deck materials in good condition. Consider using fire-resistant rated materials or heavy timber construction. Routinely remove combustible debris (pine needles, leaves, twigs and weeds) from the gaps between deck boards and under the deck. Enclosing the sides of the deck (with 1/8" metal mesh screening or non-flammable siding) may reduce this type of maintenance. Do not store combustible materials under the deck.
Flammable Items	Keep the porch, deck and any directly correlated home areas free of any ignitable or flammable type materials (e.g., baskets, newspapers, pine needles and debris). Keep firewood, bales of hay or straw, and other flammable materials at least 30-feet away from a structure.
Foundation and Crawl Spaces	All foundation vents should have a 1/8" corrosion-resistant metal screening. In crawl spaces, remove combustible materials and install 1/8" mesh screening.
Residential Fire Sprinkler Systems	Required in all new and two family dwellings and townhouses. Existing residents that increase/replace the gross floor area to 3,500 feet or more and the aggregate structural alteration is greater than 1,000 feet in gross floor area cumulatively dating back to 1991 are required to install an automatic fire sprinkler system. Annual maintenance service or inspection of these systems is strongly recommended to ensure operability.

**See California Building Codes, Chapter 7A for additional information.*

6.2.3 Natural and Cultural Resources

Actions to defend and protect life safety, structures, and infrastructure are foremost in a wildfire emergency, with protection of natural and cultural resources secondary in suppression priorities. Pre-fire preventative measures at smaller individual and large property scales can reduce wildfire severity outcomes. Reduction of wildfire impacts on natural and cultural resources is primarily accomplished through implementation of fuel treatments. The map of extensive WUI zones in Siskiyou County clearly depicts each community surrounded by wildland vegetation. Responsible solutions include collaborative actions by agencies and community members to proactively address the fuels situation at both the individual property and the immediate wildland areas adjacent to each community. When defensible space, roadside fuel treatments, and expanded area fuel treatments are integrated into a holistic hazardous fuel mitigation strategy, the County's natural and cultural resources are also afforded an enhanced level of protection from a fire that may originate from a structure and spread into the wildland vegetation.

Middle Falls – McCloud River
Courtesy of J.Titus

In vast spans of Siskiyou County area wildlands, many of the historical cultural and/or natural resource areas have been identified, mapped and cited with specific protection mitigation measures by resource specialists. Preventative measures, such as fuel reduction and infrastructure maintenance, can significantly reduce the potential adverse impacts of severe wildfire on watershed and wildlife resources.

During a wildfire event, standard operation practices include acknowledgement of these protection measures in suppression strategy. The use of standard 'best management practices' is employed to minimize impacts to the cultural and natural resources. The USDA Forest Service employs fireline Minimum Impact Suppression Tactics (MIST) tactics with consideration to immediate priorities and wildfire severity factors. MIST is not intended to represent a separate or distinct classification of firefighting tactics but rather a mindset of how to suppress a wildfire while minimizing the long-term effects of the suppression action.

6.3 FUELS MITIGATION STRATEGY

Fuels management is the planned manipulation of the amount, composition, and structure of vegetation/fuels within wildland ecosystems to modify potential fire behavior and its effects. The primary goals of fuels management are to reduce a wildfire's intensity, slow fire spread, and minimize the severity of fire effects (NPS, 2004). Fuels mitigation, structural hardening actions, and completing emergency preparedness activities well before a wildfire event will greatly influence the success in protecting life safety and reducing impacts to values across the communities and landscapes of Siskiyou County.

Wildfires have been a significant component of the Siskiyou County landscape for centuries, and no amount of manipulation and management will likely eliminate their presence. Focusing on the individual structures and communities where social costs are highest has the potential to increase cost savings, promote success in preventing community losses through increased efficiency of firefighting resources, and reduce impacts on native plant communities that serve as a source of biological and genetic floral diversity (Lombardo, 2012).

The basis for a fuel mitigation strategy is to enhance wildfire prevention and protection for life safety, structures, natural resources and other values identified by community citizens while also protecting the visual quality of the community, watershed, and its biological and cultural resources. A community developed strategy provides fuel treatment guidelines that give communities of Siskiyou County maximum flexibility to carry out current and future hazardous fuel reduction projects. These treatments should be planned and developed strategically utilizing fire science including fire behavior projections from the fire assessment outcomes explained in Section 5 of this plan. These projects will likely require additional site-specific planning with consideration of factors including - but not limited to – land ownership, land use, natural and cultural resources, and other identified values. Vegetation treatments in some cases may require extensive environmental review involving the CEQA, NEPA, and collaboration with property owners.

6.3.1 Fuel Treatment Activities

The following segments provide general information about the primary types of fuel treatment actions that are already implemented, in planning stages or recommended for future consideration. These treatment actions will vary in design specifications in the various communities and their adjacent properties within the County.

IMPORTANT NOTE

It is critical that each community work collaboratively to design fuel treatment actions that meet their area needs and utilize information and guidance provided in this plan

6.3.1.1 Roadside Treatments (Fuel Breaks)

Roadside fuel treatments, also known as Fuel Breaks (see Glossary) should be considered a high priority treatment in every WUI area of Siskiyou County. These treatment actions can moderate fire intensity adjacent to roads and driveways thereby providing safer operational space for firefighters, improving access/egress for firefighting equipment, and providing safer evacuation routes for residents and visitors during a wildfire event. Roadside or driveway fuel treatments width/height may vary depending on fuel type and terrain. As long as defensible space principles are followed, a fuel treatment design may allow for "feathered" or gradient fuel treatments to soften an appearance of vegetated walls.

Roadside fuel treatment: pre-treatment, left-side; post -treatment, right-side.

Throughout many areas and communities of the County, primary travel routes (arterial roads) are regularly maintained by County or State agency personnel and equipment. Roadway fuel reduction treatments (roadsides and medians) should be applied to all public and private road systems. Local level CWPP action plans should reflect the importance of roadside vegetation maintenance by listing it in the top priorities and ranking road segments for implementation, per input from local fire emergency responders.

The concept of roadside treatment standards is also incorporated for trailheads, public vistas, parking areas and other high visitor use areas. Generally, a fuel reduction zone or fuelbreak type treatments is designed to remove fuels in a zone-type pattern of specified width, around or along an area of concern or a prominent feature. Examples may include but are not limited to; valued cultural or natural resources, ridge-top features, water sources and recreation areas. This strategy reduces highly ignitable fuels in the foreground of a feature; which act as a wick or 'ladder fuels' for wildfire to quickly advance.

6.3.1.2 Fuel Treatment Units

Areas or plots of landscape fuel treatments are referred to as Fuel Treatment Units (FTUs). These treatments may contain a mixture of non-developed land, private property with wildland vegetation, and maintained landscapes. The location and size of an FTU may vary with vegetation type and treatment objectives. These units require careful planning and coordination work with surrounding landowners and agency administrators. In most cases, a fuel treatment area may be best accomplished using multiple types of treatment alternatives; rarely is there a one-size-fits-all option.

Fuel reduction activities will not occur on every acre of an FTU, but will be strategically located to break up the vertical and/or horizontal continuity of the fuel bed. If an FTU includes an area of specific value or concern, the prescribed treatment in that immediate area will have a more intensive focused treatment prescription.

The fuel treatment prescriptive guidelines presented in Tables 29-30 provide guidance to individual property owners and collaborative partners for implementation.

Existing Fuel Treatment Activity

Many communities have completed numerous projects through a combination of roadside and/or Fuel Reduction Zone (FRZ) treatment activities and enhanced structure protection projects (i.e., water storage structures, signage, and defensible space). These efforts need to be expanded upon to improve safety for fire apparatus access/egress and strengthen life safety along all primary evacuation routes and key high use areas within all communities across the County.

Maps and spreadsheets of project level treatments should be displayed in local level CWPPs as they cannot be properly displayed at a countywide map scale. This CWPP can be utilized as a centralized database for projects for each PR as projects are completed, however this task must be cooperatively adopted and supported by the local community's and their FSC's to become a consistent and useful tool. This task will require organized participation and follow-up for successful implementation.

Table 27 - Existing Fuel Treatment Units (*EXAMPLE TABLE FOR LOCAL CWPP USE*)

Community and/or FSC Title			
Unit Number	**Name | Treatment type**	**Acres**	**Year(s)**

6.3.1.3 Fuel Treatment Maintenance

Portions of Siskiyou County have invested a significant amount of time and funding since the late 1990's to implement fuel treatment activities within WUI vicinities. Without maintenance, these treatments will decrease in both magnitude and effectiveness, eventually becoming ineffective in reducing fuel hazards. Only through recurring maintenance will these fuel treatment projects remain viable wildfire hazard mitigation features for the community. Site specific annual vegetation growth and regrowth will determine the frequency of fuel treatment maintenance required to remain effective in reducing potential wildfire severity characteristics.

Communities that have implemented these treatments should have records that include Project Name, Area Treated, Treatment Description, Project Map, Date Completed, and Maintenance Schedule. Often this tracking record is housed with the local community FSC and/or with FSCSC. The tracking is important for accountability and understanding of the necessary project treatment re-entry interval to maintain reduced fuel levels.

6.3.1.4 Vacant Parcels

Current Siskiyou County wildfire defensible space regulation codes only apply to properties with a habitable structure, utilizing the State's PRC 4291 policy. However, in 2018 some communities adopted ordinances that address this issue (i.e., Lake Shastina and Yreka). The County is looking into developing a countywide code to address defensible space regulations on vacant parcels. For Local CWPP work it is important to check with a CAL FIRE representative, community planner, and/or local fire department to obtain updated policy and/or specific area ordinances addressing vacant parcel and open space wildfire defensibility.

6.3.2 Prioritization of Fuel Treatments

A fuel mitigation strategy provides a foundation for the treatment prioritization process. Prioritization of community fuel reduction projects helps to guide citizens in decisions for both the planning and implementation stages. The priorities promoted in this plan are:

1. Life Safety
2. Property – structures, infrastructure
3. Resources – natural, cultural, visual, recreation

The fuel treatments recommended follow a basic premise: areas in need of fuel reduction that are located in close proximity to or can significantly affect fire behavior around dwellings or infrastructure are a higher priority for treatment than those areas that are further away from improvements. The outputs from fire modeling in Chapter 5 are factored into the prioritization process with VERY HIGH hazard/threat areas (higher flame lengths) and areas closer to residences receiving a higher treatment priority. Strategically located fuel treatments in extended WUI zones are also of high priority as these can significantly reduce the size of wildfires.

A highest priority action for all areas should be roadside fuel reduction treatments (fuel breaks), to enhance life safety protection measures related to community evacuation and firefighter access. Another high priority is to ensure the long-term viability of past fuel treatments through maintenance of the existing treatments along key roads and high public use areas in all communities. As funding and personnel become available, the next step actions taken should be planning and implementation of fuel reduction activity in identified Fuel Treatments Units throughout and adjacent to WUI areas.

For each PR the FTUs are to be prioritized starting with and using the percentage of the fire threat ratings as modeled outcomes (shown in *Section 5. Wildfire Assessment*). The FTU area with the highest percent of Very High fire hazard is the number 1 priority for treatment, while the FTU with the lowest percent of Very High fire hazard/risk (fire threat) is placed at the end of the Very High category priority. Where two FTUs display the same percent of Very High fire hazard/risk (fire threat), the ranking then goes to the percentage of High fire hazard/risk (fire threat) classification to determine which FTU has a higher priority.

Amongst other factors to consider and discuss with local agency emergency responders is their response time to a given location. Example tracking for this prioritization process is shown in Table 28.

Table 28 - Recommended Fuel Treatment Unit Priority by Fire Threat *(EXAMPLE TABLE FOR LOCAL CWPP USE)*

Priority	FTU Name	Unit Number	Percent Very High Fire Threat	Percent High Fire Threat	Percent Moderate Fire Threat
1	(i.e.) Hwy 97 FB	116	45.3	15.9	20.0
2					
3					
4					

6.3.3 Fuel Treatment Levels and Prescriptive Guidance

Fuel treatment prescriptive guidelines vary by intensity of fuel reduction. The level of intensity is determined by the vegetation type, topography, and may be limited by location in sensitive habitats, historical and cultural sites, soil, watercourses, and proximity to structures, driveways, and roads. The intensity of treatment is measured by the amount of vegetation treatment required to meet site-specific hazard reduction goals (e.g., high intensity treatments generally remove a greater volume of fuel than does a low intensity treatment). The goal is to modify potential fire behavior, thereby reduce the wildfire impacts on community assets.

Fuel treatment planning must follow local and state regulations with a common objective of reducing potential fire intensity, rate of spread, and severity of fire effects. Achieving the standards of a fuel mitigation strategy reduces the opportunity for a wildfire to spread from undeveloped areas to structures or from human development into wildland areas.

It is important to understand that the hazard mitigation work can be costly and prone to limitations such as budget, environmental, property owner authorization, and workforce constraints.

6.3.3.1 Fuel Treatment Prescription Guidelines

The following tables describe the treatment prescription specifications to achieve varied intensity levels for Roadside and Driveway Fuel Treatments (Table 29) and Fuel Treatment Units (Table 30). The prescriptions in these tables are minimum guidelines. Often circumstances such as legalities in land ownership and mechanisms for funding will limit the extent of treatment. Treating more area is ideal in creating an environment of resilience in a wildfire environment (see *Appendix H - Future Considerations for Expansion*).

TERMINOLOGY TIP

Crown/canopy spacing: The distance from the edge of one tree canopy to another which varies from open (with 10 feet or more of space between tree canopies) to closed (where trees may be growing in very close proximity with little space between them).

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Table 29 - Roadside Fuel Treatment Prescriptive Guidelines

Location → Fuel Type ↓	Primary Zone (A) (up to 50')* (distance varies with terrain & accessibility)	Secondary Zone (B) (50' – 100')* (distance varies with terrain & accessibility)
Grass/ Forbs	Reduce fuel depth to 3 inches.	Treatment may not be needed.
Surface dead/down material (primarily correlated with tree and chaparral overstory)	Remove all large (>3-inches diameter) dead/down material.	Remove up to 75 percent of >3" diameter dead/down material.
Chaparral/Shrub	Remove all chaparral vegetation within this zone.	Remove up to 75 percent of chaparral vegetation. An open stand characteristic up to 40 feet spacing. Allow for intermittent small pockets or clumps of chaparral/shrubs. Small, less dense pockets/clumps of chaparral remaining should be healthy young-growth stage maintaining less volatile species composition and limbed to 1/3 height of chaparral/shrub crown. Chipped or masticated material may be "blown" back onto the slope where feasible to enhance soil coverage.
Trees Overstory (without chaparral/shrub understory)	Limb all trees to 6-feet or ½ of the live crown in this zone, whichever is less. Trim branches protruding over the roadway or driveway to a minimum height of 13-feet 6 inches. Thin trees leaving crown spacing up to 20-feet.	Same treatment as Zone A; may decrease crown spacing to 10 feet in tree overstory.
Trees Overstory (with chaparral/shrub understory)	Thinning specifications, same as Trees Overstory (without understory), but remove all understory chaparral/shrubs below trees in this zone.	Same treatment as Zone A leaving occasional small, less dense chaparral/ shrub clumps and pockets in openings without canopy is acceptable.
*** Treatment is subject to local standards that may be in effect for individual community.**		

Table 30 - Fuel Treatment Unit Prescriptive Guidelines

Location →	Primary Defense Zone (A) (0 – 30')*	Fuel Reduction Zone (B) (30' – 100')*	Fuel Reduction Zone (C) (100' – 200')*
Fuel Type ↓	**Based on PRC-4291 and HIZ Recommendations**		**Based on Firefighter Safety**
Grass/ Forbs	Reduce fuel depth to 4 inches.	Same treatment as (A); longer grass in isolated open areas is acceptable.	Treatment may not be needed.
Surface Dead/Down Material	Reduce the amount of dead/down materials.	Reduce dead/down flammable material to < 3" depth; and < 5 tons/acre in non-contiguous isolated logs acceptable.	Reduce heavier pockets of dead/down flammable material to < 5" depth; < 5-7 tons/acre in isolated logs acceptable.
Chaparral/ Shrub	Remove all chaparral. Individual ornamental shrubs should be spaced generally 2x shrub height.	Remove up to 75 percent of chaparral vegetation. Allow for intermittent small pockets or clumps of chaparral/shrubs. Pockets and clumps of chaparral remaining should be healthy young-growth stage and limbed to 1/3 height of chaparral/shrub crown.	Less intensive brush removal with up to 30 foot for spacing of pockets and clumps of chaparral and shrubs. The remaining pockets and clumps of chaparral should be healthy and at the young-growth stage; and limbed to 1/3 height of chaparral/shrub crown.
Trees Overstory (without chaparral/shrub understory)	Thin trees leaving at 10-20 foot crown spacing (based on slope, tree size and type); limb/prune lower branches 6-feet above grade level, or lower 1/3 of tree height on smaller trees.	Thin trees leaving approximately 10 foot crown spacing (based on slope, tree size and type); limb/prune lower branches 6-feet up, or lower 1/3 of tree height on smaller trees and removing all broken limbs and dead material.	Thin trees leaving approximately 10 foot crown spacing (based on slope, tree size and type); Limb and prune lower branches of larger trees up to 6-feet and removing all broken limbs and dead material.
Trees Overstory (with chaparral/shrub understory)	Thinning specifications are the same as Trees Overstory without Chaparral/shrub understory in Zone A. Understory: remove chaparral; limb/prune ornamental shrubs to 1/3 of shrub height.	Thinning specifications are the same as Trees Overstory without Chaparral/shrub understory (Zone B). Understory: occasional small, less dense chaparral/ shrub and small tree clumps and pockets in openings without canopy and small trees in openings (non-canopy) are acceptable.	Thinning specifications are the same as Trees Overstory without chaparral/shrub understory in Zone C. Understory specifications are the same as Chaparral/shrub in Zone C except the pockets and clumps are limited to tree openings (non-canopy).
*** Overstory Thinning Treatments should include oversight by local professional forester in support of forest product utilization.**			

6.3.3.2 Implementation Restrictions for Fuel Treatment levels

IMPORTANT NOTE

Fuel treatment implementation restrictions must be considered on a site specific/project level basis; beginning in the planning phases of project development.

The following describes potential limitations and/or restrictions in implementation of Roadside and Fuel Treatment Units:

- CEQA may be required prior to implementation of site-specific projects.
- Shrubs will vary in size randomly scattered across the project area. Masticated material along roads, recreation trails, and recreation sites should not exceed 6-inches in depth.
- Burn piles will be up to 4′ x 4′ x 4′ to assure the burn patch will recover.
- Consideration for some visually sensitive areas: boundaries between treatment levels can maintain free-form shapes and feathered edges that replicate natural patterns and profiles in surrounding landscape; avoid straight lines by scalloping and feathering along edges of vegetation. The feathering effect includes undulating edges horizontally and diverse heights of the brush retained on site.
- Precautions should be taken to prevent scarring of trees by equipment.
- Signs should be posted warning the public of potential hazards during fuel treatment activities.

Sensitive plant and animal species:

- Locations where sensitive plant species are found should be flagged and avoided or if the density of species makes avoiding unfeasible, the area will be excluded from the treatment. Flagging and avoiding these plants will prevent damage from foot and vehicle traffic.
- In some locations a limited operating period for vegetation treatments must be observed in suitable nesting habitat. This timing is species specific and an agency specialist will need to be consulted during planning phases.

Noxious Weeds:

- To limit the spread and establishment of invasive plant species (e.g., noxious weeds) into project areas, all off-road heavy equipment used during project implementation should be washed free of noxious weeds and seeds or invasive exotic weeds and seeds before entering project areas. If any equipment works in an area where weeds occur, it is important to ensure that it be washed (especially the undercarriage), to remove weed propagules prior to entering other work locations that are free of weeds and prior to leaving the project area.
- All equipment staging areas and burn pile areas will be located away from known areas with noxious weed occurrences.

Cultural Resources:

- Any known cultural resources within the proposed project area will be protected. If any sensitive cultural resources are found, work will stop and a qualified Archaeologist will be notified.

Soil and Watershed:

- Every effort should be made to minimize damage to surface soil structure and to reduce potential for erosion and sediment transport to drainages due to fuel management activities.
- Mechanical equipment use on slopes greater than 35 percent is not advised with following exception: Mastication can occur on slopes greater than 35 percent where the equipment is operating on slopes less than 30 percent and accessing steeper slopes with a boom arm.
- Chipped or masticated material may be "blown" back onto the slope where feasible to enhance soil coverage.

Recommended Best Management Practices (BMP's):

- All riparian areas and wetlands should be marked on project area maps.
- Use of heavy equipment is not permitted in sensitive areas. Equipment with low ground pressure coefficients is less likely to cause soil disturbance.
- Known landslide and unstable areas should be avoided for safety reasons and because vegetation treatment activities may result in increased potential for mass wasting and sediment delivery to stream courses.
- Heavy equipment should not work on slopes greater than 35 percent. Movement of any heavy equipment across slopes should be minimized. Heavy equipment will not be used in riparian areas.
- To protect streams and stream courses, the following shall be implemented:
    - Streamside Management Zone (SMZ) courses must be identified and flagged prior to any type project implementation that will involve equipment use.
    - Location and method of stream course crossing should be identified prior to fuel reduction activities to protect the stream course. Permit may be needed depending on potential impact to water quality.
    - Contractor shall repair all damage to a stream course, including banks and channels, to the extent feasible.
    - Project vegetation debris shall be removed from the stream course as needed to maintain or enhance hydrology or fisheries.
    - Water bars and other erosion control structures will be located so as to prevent water and sediment from being channeled into stream courses and to dissipate concentrated flows.
    - No servicing or refueling of equipment will occur on site. Operators must remove residues, waste oil, engine coolants, and other harmful materials from all worksites. Spill containment will be established prior to any on-site servicing or refueling.

6.3.4 Fuel Treatment Types

Fuel treatment types are generally described by the method of vegetation modification – mechanical, manual, prescribed fire, biological (grazing), and herbicide treatments. The fuel treatment strategy for communities of Siskiyou County can involve all of these treatment types. The following are brief descriptions of common fuel treatment implementation methods per fuel treatment type.

Mechanical: This type of treatment is generally associated with larger fuel treatment areas where the cost of contracting industrial machinery can be offset by rapidly treating larger portions of the landscape. Mechanical treatments can also be effective for linear treatments such as roadsides. Common methods include:

- **Mowing** of grasses, weeds and low-shrubs is likely a familiar treatment activity to those that care for lawns, yards and ranch fields. Mowing rearranges the hazardous fuels, producing a less flammable configuration. The treatment lowers the vertical component of light flashy fuels, leaves debris in place, and thereby reduces exposure to wind and allows more moisture absorption from the soil. This process reduces the potential fire behavior characteristics of the fuel. Mowing in a larger area is typically accomplished using:
    - a commercial size mower where the operator rides atop the equipment
    - a mower is dragged behind a vehicle or piece of equipment
    - the familiar push-type gasoline-powered mower
- **Mastication** is the mechanical grinding, crushing, shredding, chipping, and chopping of fuel and leaving debris in place. This treatment is used primarily in stands of chaparral shrub, mixed shrub, and trees or slash and vegetation in the understory of a timber stand. Mastication rearranges the hazardous fuels, producing a less flammable configuration. This treatment takes vertically oriented fuels and rearranges them into horizontally oriented fuels through the process of cutting and chipping of the standing vegetation; which exposes the fuel to less wind and allows it to absorb moisture from the soil. This process reduces the potential fire behavior characteristics of the fuel. Several types of machinery have the capacity to do this mastication work. Examples include:

South Mount Shasta Area
Courtesy of J. Titus

    - feller-bunchers or skidders modified with a masticating head
    - tractors pulling a mower/masticating head
    - excavators with a masticating head on their boom
    - dozers with masticator-type capability
    - innovative custom machines with masticating capabilities
- **Commercial and Pre-Commercial Thinning** of trees and shrubs is used as a treatment to modify the fuel structure in stands of trees and shrubs/brush that consist of a dense understory. Thinning a stand reduces ladder fuel and/or crown fuel continuity. A thinning treatment can provide economic returns, possibly producing some

WUI Property Thinning
Courtesy of J. Titus

commercial products that should involve a Registered Professional Forester to develop thinning prescription guidelines. In most cases, thinning is only effective as a fuel management technique when the fine surface fuels are also reduced (Agee, J., Skinner, C., 2005).

A thinning prescription generally uses spatial distance between crowns, diameter limit for trees removed, specified retention basal area (amount of tree-bole cross-section area per specified area and is typically measured by square feet/acre). An adequate thinning treatment prescription should include specific guidance for treating the residue slash material, discussed subsequently. Equipment involved in various stages of thinning include:

- feller-buncher,
- rubber tired or tracked skidder,
- cable yarder,
- Chainsaws,
- landing equipment such as forwarder, cutter, peeler, and chipper

- **Slash treatment** may include removal, chipping, mastication, or piling and burning. A less desirable option in steep and/or inaccessible ground in more remote areas is an intensive lop/scatter treatment. It is an important final step in a thin treatment but can also be a primary fuel reduction treatment in a timbered area that has not been thinned. Mechanical slash treatment equipment is similar to that used in a mastication option and may include:
  - feller-bunchers or skidders modified with a masticating head
  - small dozer or masticating type machine
  - excavators with a masticating head on their boom
  - innovative custom machines with masticating capabilities
  - chipping equipment to chip debris/material and spread onsite or hauled offsite

Manual: This process utilizes human labor to manually cut and remove or rearrange fuel. Thinning, pruning and clearing of fuel are among the most common methods. Fuels treated manually are either chipped into a less flammable state (similar to mastication), removed from the site by a vehicle, or piled for burning at a later date when weather conditions preclude fire from spreading across the landscape. Manual fuel treatments are more precise than mechanical treatments and can address hazardous fuel conditions without having a significant impact on visual, cultural, or biological resources.

- **Hand Thinning** or removal of the smaller (typically non-merchantable sized) trees and shrubs is used as a treatment to modify the understory fuel structure in timbered stands with dense understory tree and shrub growth.
  - Hand saws or gas-powered chain saws

- Small axe type tool
- Shears or other cutting tools for very small diameter trees/shrubs

- **Limbing or Pruning** of larger trees
  - Pole saw (gas or hand powered)
  - Hand saws or gas-powered chain saws
  - Shears or other cutting tools
  - Long-handle lopper tools
  - Pruning shears
- **Cutting, Hoeing or Raking** of surface shrubs, slash and debris
  - Heavy duty hoe (e.g., McCleod type tool)
  - Rock rake or heavy duty rake
- **Handpiling**
  - Surface slash, limb wood and debris are piled by personnel
- **Weed-whacking** of grasses and low-growing shrubs
  - Cordless, electric or gas-powered weed whacker
  - Rake with scraping/cutting edge (e.g., McCloud type tool)

Prescribed Fire: Under appropriate weather conditions prescribed fire can rapidly eliminate fuel. Under carefully designated environmental prescriptions, fire can be applied as a treatment with or without manual or mechanical pre-fire fuel mitigation activities. However, within WUI zones, fire treatment is usually limited to use in conjunction with a piling and burning of slash operation. Pile burning is a cost-effective way to address the elimination of hazardous fuel. The slash/debris piling procedures follow specific guidance including pile size and location on a given site. The pile burning step takes place in cool moist winter conditions and must adhere to regulations per CAL FIRE and air regulators due to possible negative impacts to air quality.

Pile Burning
Courtesy of J. Titus

Larger area burning requires additional level in permitting and implementation of burning will have an elevated level of complexity and oversight by trained personnel. An approved burn plan and smoke management plan must be on file with the administering agency. Factors such as slope steepness, accessibility, proximity to other homes/property, smoke impacts, and ability to meet area burn prescriptions are a few associated complications. Complexity issues in prescribed burning operations are associated with risk, cost and feasibility to conduct operations in a safe and timely manner while achieving effective hazard reduction outcomes.

In some areas of the County, there are current efforts to take careful steps toward reviving community prescribed fire programs. Important elements include training and workshops with oversight from experienced agency wildfire managers, as well as insight from local experienced tribal representatives.

<u>Biological:</u> This treatment involves the use of domestic livestock grazing or browsing to reduce surface fuel loads and can be very effective. Grazing can reduce costs correlated with hand and mechanical treatments. Treatment location is restricted due to the necessary focus on: small areas, typically 'strips' of land along roads, fencing requirements, transportation costs and access/transport of water from sources to the site.

The animal of choice for grazing within communities are typically goats. Containment of these animals within a fuel treatment unit assures that they eat only the target vegetation. Goats are indiscriminate eaters and eat most plant species; however, they prefer younger soft vegetation and will often eat the non-target vegetation (e.g., ornamental vegetation) prior to eating the vegetation considered hazardous.

Goats also have the risk of spreading invasive species when not maintained on a weed free diet prior to placement on site. The goats can also cause soil disturbance as they walk within the confined treatment unit. Smell and noise are also a concern when deploying goats within residential areas. Another consideration is the effect of animal waste on nearby waterways. There are known incidences of goats falling prey to predatory cats in Siskiyou County.

<u>Herbicide:</u> This treatment type involves a broad or hand-applied chemical application to kill live vegetation. Siskiyou County's Agriculture Department Resource Protection website is a source for current information on this method.

<u>Disposal of greenwaste/fuels</u>: Can be a difficult task in neighborhoods for many citizens. This should be a topic of discussion within each local community and should include conversation with local fire department and agency personnel. In some cases, current efforts are underway for alternative offsite drop areas at scheduled intervals.

6.4 WILDFIRE EVACUATION

Evacuations save lives and allow responding personnel to focus on the emergency at hand. Wildland fire emergencies in recent years across northern California have reinforced the importance of the message stated foremost in CAL FIRE Evacuation Tips:

'Please evacuate promptly when requested!'

Communities of Siskiyou County are nestled in a wildland fire environment. It is the responsibility of each and every citizen to become educated on how they can adapt to build resiliency in their hometowns. <u>Knowledge, mitigation actions and pre-planning are key components to survival</u>.

The 'Ready, Set, Go' suite of preparedness tools described in *Section 6.1.1* is a user friendly and informative set of tools to help citizens learn and prepare themselves, their families and neighborhoods for living in a wildfire environment. Everyone must have a plan in place (the 'Set' step of preparedness).

In an official evacuation request, the procedural terms 'Evacuation Warning' or 'Evacuation Order' are used to describe the alert level, defined as follows (Siskiyou County OES, 2018):

- **Evacuation Order:** Movement of community members out of a defined area due to an immediate threat to life and property from an emergency incident. An Evacuation Order should be used when there is potential or actual threat to civilian life within 1 to 2 hours or when the IC deems it necessary to protect civilians.
- **Evacuation Warning:** Alerting of community members in a defined area of a potential threat to life and property from an emergency incident. An Evacuation Warning may be issued when the potential or actual threat to civilian life is more than 2 hours away.

All evacuation instructions provided by officials should be followed immediately for your safety and for the safety of first responders (CAL FIRE Evacuation Tips, 2019).

IMPORTANT NOTE

California law authorizes officers to restrict access to any area where a menace to public health or safety exists due to a calamity such as flood, storm, fire, earthquake, explosion, accident or other disaster. Refusal to comply is a misdemeanor.

(Penal Code 409.5)

There are areas across Siskiyou County that present significant challenges for evacuation due to access and egress complications and in some cases, the speed and/or intensity in which wildfires in the area could burn. Route problems include narrow roads, winding roads, steep roads, steep terrain, vegetation encroachment on roads, gates, bridges, addresses not clearly visible from the property access point, unlit roads, one way access in or out, intersections, and unlit street signage. These access route impediments can rapidly impede emergency response times and evacuations, so citizens are advised to heed initial exit warnings.

A WUI wildfire is a dangerous emergency and evacuations are complicated by additional factors such as human behavior, population density, limited and/or overloaded transportation routes, vulnerable and mobility-limited populations, businesses employees, visitors, and the evacuation of animals. The lead time required to conduct mass evacuations during a wildfire event can be very short and immediate. Both the 2018 Klamathon and 2014 Boles Fires are examples of a rapid WUI wildfire emergency escalation without time for advance evacuation warnings.

During the extreme conditions in Butte County's 2018 Camp Fire, evacuation routes were quickly overwhelmed forcing residents to abandon vehicles. Tactics could have reduced this mayhem including opening both lanes to out-going traffic. Success in community and/or multi-neighborhood evacuation necessitates pre-planning and practice to accommodate a safe exit strategy.

6.4.1 General Evacuation Process

Siskiyou County's Sheriff Department is the responsible party to authorize implementation of an evacuation order. During a wildfire emergency, the Sheriff Department's decision to evacuate an area will be conducted in coordination with appropriate local, state and federal fire protection agencies and an Incident Commander.

In some cases, individual communities have identified "Temporary Refuge Areas" or designated areas to move into and temporarily stage during wildfire evacuations. Citizens should check with their local fire department/FSC representatives to learn their routes and any designated staging areas.

Siskiyou County also has several locations that may be designated "evacuation shelter sites", available to families, elderly, invalid adults, and animals during an emergency. These include public facilities such as fairgrounds, schools, and parks. (County of Siskiyou, CA Emergency Operations Plan, 2018).

IMPORTANT NOTE

Each individual Community needs to work with local law enforcement and wildfire protection workforces to ensure that every citizen is aware of local Evacuation Preparedness and Procedures.

6.4.1.1 Fire Protection Agencies

Local, state and federal agencies participate in yearly drills and training and work in conjunction with the Office of Emergency Services (OES) for planning possible evacuation needs. These agencies follow responsibility protocol provided in interagency mutual agreements and regularly revisit the Wildland Fire Emergency Operations Plan, which defines initial attack, operational needs, and training. Siskiyou County OES is in the final stages of updating the County Hazard Mitigation Plan, including evacuation planning, which encompasses roles and regulations of all the agencies that maintain responsibility in an emergency situation. Area agencies and resources include: County Sheriff's office; local, state and federal fire departments; county and state level OES; California Highway Patrol; local Police Department(s), American Red Cross, City services and others. The decision and responsibility of an evacuation order falls with law enforcement; Sheriff and police departments. Fire suppression is a cooperative interagency response, the lead agency depends on wildfire area jurisdiction.

6.4.1.2 During Evacuation

- Emergency responder agencies will work with law enforcement on decisions regarding the need to be evacuated and the timing. Emergency responders will do their best to notify occupants.
- Law enforcement agencies are responsible for carrying out evacuations and enforcing security in evacuated areas.
- Representatives of local communities will work closely with emergency service agencies to ensure that local needs are communicated.

There is not a 'ONE-SIZE-FITS-ALL' process for wildfire evacuation procedures. Survival depends on prompt and mindful actions. Success depends on the ability to retain composure and grasp 'Situational Awareness' before taking action. LEARNING and PLANNING AHEAD are key factors.

- The Red Cross and/or Siskiyou County Human Services will establish shelters where people can go during the evacuation.
- Law enforcement will control traffic flow and maintain access for emergency equipment. They may utilize workers from CalTrans, local public works departments, the Sheriff's Posse, fire departments or mutual aid Law Enforcement Officers from other jurisdictions.

6.4.1.3 Emergency Response Communication

(See Section 6.1.2 Area Notification Systems for details and website information)

All fire and medical agencies in Siskiyou County respond to emergency calls through the Yreka Interagency Command Center (YICC). Responses are made based on a closest resource basis and each agency plans for and adjusts equipment based on time of year and anticipated needs. Additionally, some neighborhoods have established pre-planned emergency communication networks.

When a wildfire emergency requires evacuation, the Siskiyou County Sheriff's Department and Fire Department will employ all communication methods to attempt to notify and alert individuals. However, as experienced in the rapid wildfire events of 2017 and 2018 throughout California, communication systems can become overwhelmed. Therefore, all citizens must keep up their awareness of the dynamic situation. Proactive evacuation response remains the best option, especially when transportation responsibility includes dependent people and/or animals.

Emergency communication includes but is not limited to:

- Code RED
- Emergency Alert System (EAS) supported by the National Weather Service broadcast
  - NOAA Weather Radio 162.5
  - Local Radio Stations
- Radio and television announcements
- Exterior electro/mechanical sirens (in some communities)
- Door-to-door notifications
- Social media, such as Twitter and Facebook

Countywide Emergency and Law Enforcement Telephone Contacts include:

- Call 911 for emergency.
- Alternative emergency number (Sheriff's dispatch) for fire, medical, or law enforcement: 530-841-2900 or 1-800-404-2911
- Sheriff's Office non-emergency: 530-842-8301

***** For more Emergency Communication detail see *Section 6.1* *****

6.4.2 Evacuation Routes

The goal of an evacuation route is safe exit to a safer location. When not faced with pending emergency, every resident should identify and become familiar with preferred evacuation routes as well as learn potential alternative routes if fire behavior and/or road conditions require a change. Predetermine a safe place to stay during the emergency. Identify the main roads out of the area and review viable options to gain safe access to them. While reviewing potential routes, it is important to consider and visualize others exiting the area in addition to incoming emergency vehicles, all on the same roads.

Delta Fire

IMPORTANT NOTE

Specific evacuation route guidance and road safety conditions including adequate clearance of roadside vegetation should be reviewed at the local/community level by experienced wildfire protection representatives and addressed in local CWPPs and/or Evacuation Plans.

See *PART II. Planning Regions* for Primary Route Information by Planning Region.

6.4.3 Potential Issues with Evacuation

- Residents, business-owners and tourists/visitors may not have established preparedness plans.
- Individuals may choose to not evacuate, but instead stay and defend their properties or to shelter in place until the fire danger passes. These decisions can put their life safety, as well as that of emergency personnel, at risk.
- Individuals may be slow to leave their homes due to last-minute defensive preparations or to packing personal items, thereby jeopardizing life safety by fleeing fires in a panic.

Vulnerable populations and/or individuals with limited mobility may be less likely to be aware of or be able to respond to evacuation orders (see Section 2.2.1 for details).

6.4.4 Public Health Emergency Preparedness | Vulnerable/Fragile Population

Siskiyou County's Department of Health and Human Services provides a website link to Public Health Emergency Response Preparedness: https://www.co.siskiyou.ca.us/publichealth/page/emergency-preparedness).

This site provides a list of resources to assist in planning and preparing for potential emergency situations. Included is an important pre-planning document: 'Registration Request for Access and Function Needs Individuals'.

This is an important tool that can provide for assistance to a medically fragile or incapacitated individual during an emergency. In a rapid wildfire event situation, this registration process enables advance action by emergency response personnel to assist in evacuation of these people.

6.4.5 Compromised Evacuation Situations

The ability to live resiliently in a fire prone environment calls for employing proactive mitigation actions, learning survival skills, and planning for worst case wildfire scenarios.

- Foremost in all evacuation situations: Listen to emergency alert instructions including those from the CodeRED emergency alert system and from law enforcement. It is highly recommended to have a battery operated AM/FM radio included in your evacuation kit.
- Rethink viable evacuation route (aka, 'escape route'): it is imperative that the route out is safe for travel and leads to a known safer location.
- Stay abreast of daily road construction or blocks: these projects often occur in summer months; whereas road-blocks or limited travel on primary travel/evacuation routes may be problematic.

6.4.5.1 Temporary Refuge Areas and Survivability Factors

Location of potentially survivable locations could become a significant factor if an evacuation route is compromised. Residents should be educated that utilizing this option should ONLY BE IN A LAST RESORT DECISION to survive, and familiarity with potential sites and routes should be part of their in pre-planning actions. Nearby temporary refuge locations may include:

- Water bodies and water courses of a size and depth that will provide ample protection and where trees and debris cannot fall on top of you.
- Large open green grass fields such as ball fields and large open parks.
- Large dirt fields such as well grazed or manicured (low height and density vegetated) agriculture ground.
- Large open parking lots away from trees, structures and other cars

➢ **GENERAL TIPS TO SURVIVE IN TEMPORARY REFUGE AREA**:
  - ❑ Notify 911 & a friend; inform them of your location
  - ❑ Stay calm; keep young children or dependents close to you
  - ❑ If out of vehicle, stay low to the ground; if in dirt, dig an indentation (i.e., foxhole style)
  - ❑ Protect airways with dry cotton material
  - ❑ Stay watchful of flying debris

6.4.5.2 Temporary Refuge / Shelter in Place

***** Utilizing this option should be A LAST RESORT DECISION to survive*****

IF YOUR ARE FORCED TO SHELTER IN PLACE **–** FOLLOWING ARE GENERAL SITUATIONAL GUIDELINES (Community Wildfire Protection Plan, Siskiyou County, 2008):

While in your vehicle –

- ❑ Stay calm
- ❑ Park your vehicle in an area clear of vegetation
- ❑ Close all vehicle windows and vents
- ❑ Cover yourself with wool blanket or jacket
- ❑ Lie on vehicle floor
- ❑ Use your cell phone to advise officials – 911

While on foot –

- ❑ Stay calm
- ❑ Go to an area clear of vegetation, a ditch or depression if possible (or a body of water in open area)
- ❑ Lie face down, cover up
- ❑ Use your cell phone to advise officials – 911

While in your home –

- ❑ Stay calm, keep your family together
- ❑ Call 911 and inform authorities of your location
- ❑ Fill sinks and tubs with cold water
- ❑ Keep doors and windows closed, but UNLOCKED
- ❑ Stay inside your house
- ❑ Stay away from outside walls and windows
- ❑ Note – it will get hot in the house, but it is much hotter, and more dangerous outside

After the fire passes, and if it is safe, check the following areas for fire –

- ❑ The roof and house exterior
- ❑ Under decks and inside your attic
- ❑ Your yard for burning trees, woodpiles, etc.
- ❑ Extinguish embers and sparks

SECTION 7. FISCAL RESOURCES

A primary benefit of a collaboratively approved countywide CWPP encompasses every community in Siskiyou County as a platform to qualify for grants and other potential financial resources. Often, limited fiscal resources budgetary constraints may make it difficult to address all of the needs and implement all of the projects identified in a local CWPP. A staggered approach to the implementation of proposed fuel treatments with an existing fuel treatment program will a promote wildfire protection while seeking additional funds through external sources (e.g., grants, stewardships).

7.1 POTENTIAL GRANT FUNDING SOURCES

There are numerous opportunities for federal, state, and local grants. The following identifies several grant sources:

Fire Service Grants and Funding (AFG)
Provides direct assistance on a competitive basis to fire departments of a State or tribal nation for protecting the health and safety of the public and firefighting personnel against fire and fire-related hazards.

Fire Service Grants and Funding (AFGP)
Through the Federal Emergency Management Agency's Assistance to Firefighters Grant Program (AFGP), career and volunteer fire departments and other eligible organizations can receive funding through three different grants to enhance a fire department's organization's ability to protect the health, safety of the public and protect the health of first responders, and increase or maintain the number of trained, "front-line" firefighters available in communities.

Staffing for Adequate Fire & Emergency Response Grant (SAFER)
The Staffing for Adequate Fire and Emergency Response Grant (SAFER) was created to provide funding directly to fire departments and volunteer firefighter interest organizations to help them increase or maintain the number of trained, "front line" firefighters available in their communities. The goal of SAFER is to enhance the local fire departments' abilities to comply with staffing, response and operational standards established by the NFPA (NFPA 1710 and/or NFPA 1720).

Fire Prevention & Safety Grants (FP&S)
The Fire Prevention and Safety (FP&S) Grants are part of the Assistance to Firefighters Grants (AFG) and support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal of this grant program is to reduce injury and prevent death among high-risk populations. In 2005, Congress reauthorized funding for FP&S and expanded the eligible uses of funds to include Firefighter Safety Research and Development.

Pre-Disaster Mitigation Grant Program (PDM)

The PDM Program, authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, is designed to assist States, territories, federally recognized tribes, and local communities in implementing a sustained pre-disaster natural hazard mitigation program. The goal is to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding in future disasters. This program awards planning and project grants and provides opportunities for raising public awareness about reducing future losses before disaster strikes.

PDM grants are funded annually by Congressional appropriations and are awarded on a nationally competitive basis.

CAL FIRE California Climate Investments – Forest Health Grants

- Project activities may include
    - Reforestation
    - Fuel Reduction and Prescribed Fire
    - Pest Management
    - Biomass Utilization
    - Others

Information available at
http://www.fire.ca.gov/resource_mgt/resource_mgt_foresthealth_grants.

CAL FIRE Fire Prevention Grants

Project Types and Activities
Hazardous Fuel Reduction:

- Vegetation clearance in critical locations to reduce wildfire intensity and rate of spread.
- Creation or maintenance of fuel breaks in strategic locations, as identified in CAL FIRE Unit Fire Plans, a Community Wildfire Protection Plan, or similar strategic planning document.
- Removal of ladder fuels to reduce the risk of crown fires.
- Creation of community-level fire prevention programs, such as community chipping days, roadside chipping, and green waste bin programs.
- Selective tree removal (thinning) to improve forest health to withstand wildfire.
- Modification of vegetation adjacent to roads to provide for safer ingress and egress of evacuating residents and responding emergency personnel.
- Reduction of fuel loading around critical firefighting infrastructure, including, but no limited to, fire hydrants, water drafting locations, and staging areas.
- Purchase of fuel modification equipment not to exceed $100,000.
- Removal of dead and dying trees that pose a threat to public health and safety, and meet the following characteristics:
    - Dead and dying trees must be greater than 10” in diameter and 20 feet in height;
    - Dead and dying trees reasonably accessible by equipment/machinery;
    - Dead and dying trees within 300 feet of permanent structures that pose a structural threat to the residence. (this does not include movable or temporary sheds, outbuildings, or carports).
    - Dead and dying trees within 300 feet of serviceable roadways that pose a structural threat to roadways; or public or private infrastructure.
    - Removal of dead or dying trees from existing fuel breaks; or from Tier 2 high hazard zones.

Fire Prevention Education:

- Workshops, meetings, materials creation, and other educational activities with the purpose of increasing knowledge and awareness of information that could be used to reduce the total number of wildland fire and acres burned.

Fire Prevention Planning:

- Wildfire risk or related mapping.
- Creation of Community Wildfire Protection Plans (CWPP).
- Development of evacuation plans.
- Creation or updates to wildfire mitigation plans.

Information available at http://calfire.ca.gov/fire_prevention/firepreventiongrants

California Fire Safe Council - Grant Clearinghouse Program

State Fire Assistance Grants (SFA)
These grants were established in the Cooperative Forestry Assistance Act of 1978 and are given to state forest fire protection organizations to improve fire protection on non-federal lands. They are provided on a 50-50 cost share basis and focus on several areas – 1) hazardous fuels treatments, 2) training for local firefighters, 3) creating fire-adapted communities, 4) fund two competitive processes to address high priority projects and landscapes in State Forest Action Plans, and 5) the purchase, maintenance, and rehabilitation of firefighting equipment for state forestry agencies.

SFA/WUI Grants
These grants focus on hazard fuel reduction, information and education, and community and homeowner actions in the Wildland/Urban Interface zones.

California Office of Emergency Services

Fire Management Assistance Grants (FMAG)
This program was authorized by the Disaster Mitigation Act of 2000. It provides for mitigation, management, and control of fires that threaten destruction that would constitute a major disaster. The purpose is to provide supplemental federal assistance to states and local governments to fight fires burning on public (non-federal) or privately owned forest or grassland.

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SECTION 8. MONITORING

This section provides guidance for monitoring of the CWPP as well as the activities described in the plan.

8.1 CWPP MONITORING

A CWPP's strength depends on collaboration, its relevance, and its ability to engage citizens in wildfire preparation and protection actions. This countywide plan provides a foundation rooted in current policy, a science-based wildfire assessment and mitigation strategies that are applicable to all communities across Siskiyou County. The tools and information offered are directly relevant and useful for local scale community CWPP development and updates. It is essential that this plan as well as any level CWPP, adopts a monitoring schedule to ensure that it meets necessary currency in policy, strategy and resources.

Citizens, agencies and all participants who contributed in the CWPP process should continue the progression of collaborative planning and adapt strategies based on lessons learned over time. All entities involved will benefit from reviewing successes and challenges that evolve with perpetual change while living in a wildland fire environment. In the course of implementing actions, participants in all roles learn what does and does not work. These experiences are often critical steps in identifying potential strategic or tactical changes for a CWPP revision. The monitoring step in the CWPP implementation process is an essential collaborative tool that effectively combines experience and resources for continued success moving into the future.

The FSCSC has agreed to a leadership role, accepting responsibility to initiate a collaborative review of this CWPP at (i.e.) 5-year intervals to ensure its relevance. Significant changes in policy, budget, and/or environmental conditions may warrant a more frequent review.

8.2 FUEL TREATMENT MONITORING

Community level project monitoring and evaluation of a fuel treatment establishes baseline data to draw on for decisions about maintenance treatment schedules as well as determining whether there is a need to modify fuel treatment prescriptive guidelines. Organized monitoring records are also important when pursuing funding from outside sources. The primary aspects to consider in a fuel treatment-monitoring program are the type of monitoring/evaluation and the monitoring intervals. Local level CWPPs should contain specific information pertaining to suggested project level monitoring steps.

Monitoring and evaluation of a fuel treatment establishes baseline data to draw on for decisions about maintenance treatment schedules as well as determining whether there is a need to modify fuel treatment prescriptive guidelines. The primary aspects to consider in a fuel treatment-monitoring program are the type of evaluation, equipment needed, and monitoring intervals.

Example Monitoring Option:

Simple Visual Quantitative Monitoring Program

The following is an example of the equipment needed in a basic visual and qualitative data collection monitoring/evaluation process:

- Map of Fuel Treatment Units (FTU) or Fuelbreak (FB) project with Treatment Sites
- Prescription table & info on known treatment/site
- Clipboard with field notebook or writing pad
- Pen/pencil
- GPS location device
- Tape measure
- Digital Camera

Procedures to follow in this type monitoring/evaluation fuel treatment site visit include:

- Accurate project location on a map
- Start a Project Log: entry in project specific notepad/book
    - Date of treatment
    - Site FTU or FB name and corresponding number
    - GPS coordinates
    - Fuel type
    - Treatment method used
- Take measurements of current growth heights (in grasses) or distances between sprouts in shrubs and seedling-trees.
- Take photos; GPS mark the photo site (option to physically mark the plot site with ie; brightly painted rebar stakes, aluminum tag on nearby tree).

This information should be saved in a project file and should be compiled in an electronic file system accessible to appropriate local community FSC representative.

The recommended interval for site monitoring may fluctuate with site variables such as fuel types, rainfall amounts, or other needs. It is important to understand that a fuel treatment monitoring interval is not the same as that in treatment maintenance. For instance, the maintenance interval of grass/forbs may be 3 times in a year whereas a monitoring visit may only be once. In the early stages of an established fuel treatment (timber, shrub or mixed fuel type, other than grass), an annual visit to the site for the first 3 to 5 years is recommended. This annual interval may likely be reduced in the out years depending on vegetation growth rates etc.

Developing a simple yet comprehensive monitoring and evaluation process in the vegetation management strategy is a very important and useful step. The stored files are part of the project record, which is helpful for: 1) validating fuel treatment management strategies, 2) historical perspective of fuel treatments, 3) various educational forums, and 4) providing important validation data for continuing and future grant application processes.

SECTION 9. RECOMMENDATIONS

The purpose of this section is to communicate several elements of insightful advice from the Proactive Wildland Resources team during the CWPP update development process.

This advice is provided in the form of two recommendation tables that outline suggestions to help citizens achieve their goals through successful implementation of actions that reinforce life safety and wildfire resilience throughout the communities of Siskiyou County.

These recommendations can help guide local communities in prioritizing actions and working with community leadership, fire agencies and FSCSC to obtain necessary funding.

Table 31 - Overall Recommendations (per Comprehensive CWPP Assessment Process)

Overall Recommendations
All citizens need to engage EVERY step of the "Ready, Set, Go Program".
Provide for communication and education to ensure all citizens are aware: fuel reduction actions can slow a wildfire's advance, decrease intensities and provide for fire fighter safety; AND each resident is personally responsible to take mitigation actions for their home and property.
ASAP: All communities need to identify their evacuation routes and ensure they meet wildfire safety standards. FSCs, community leadership, federal, state and local fire departments all need to cooperate in this responsibility to implement necessary mitigation actions that facilitate safe wildfire evacuation.
Local CWPP's and FSC's should provide for actions to safely identify, register and assist vulnerable populations in defensible space tasks including support in obtaining financial means (grants, volunteers) for implementation of fuel reduction activities.

Table 32 - Specific Recommendations directly related to CWPP (listed chronologically)

CWPP Section	Specific Recommendations
1.4	Due to the dynamic situation in California's post 2017-18 fire seasons and pending changes to current state policy, a vigilant update interval is needed in the first couple of years following plan approval. A suggestion is to schedule those checks with the Unit Chief of CAL FIRE Siskiyou.
3.2.4	With the County's emphasis on timber resources and the unknowns in climate flux, the tree mortality status should be reviewed and updated on an annual basis by checking with the CAL FIRE's Vegetation Management Program (VMP) representative.
5.0	Regarding fire assessment work at local CWPP level, the specific community should be sure to contact a local CAL FIRE GIS data manager representative to ensure access to the latest Fire Hazard Severity map.

6.1	Each Community should create specific evacuation brochures and website links for all populations; especially important for vulnerable populations. Information should include local evacuation information, personal preparedness planning, transportation planning, medical related needs, temporary and long-term sheltering needs, disaster kits, etc.
6.1	Ensure schools and educational facilities have updated preparedness and evacuation plans and a functional emergency radio for alert information during potential power and internet failure.
6.2.1	Community education is foremost for Life Safety. Each community should consider scheduling a local public pre-season (i.e., late spring) 'Wildfire Awareness' session to cover critical elements including readiness plans and survival tactics. Supported by interagency and/or local fire personnel.
6.3.1	Encourage neighborhood and community groups to work together to implement wildfire hazard reduction projects. Pooling or combining efforts and resources promotes more effective actions and often broadens attainability.
6.3.1	Each Community should establish or improve tracking of fuel treatment activities into a database and ensure a reporting process to their FSC rep or designated advisor. This data should be made available to FSCSC rep and CAL FIRE VMP rep. Database information includes name of the project, project type (e.g., roadside, FTU), date planned, date accomplished, type of treatment (e.g., manual thinning, chipping, mastication, etc.), acres treated, project cost, equipment used, any notable problems/issues, and map.
6.3.2	For local CWPP action planning, it is highly recommended that each community elevate area access and egress roads to the top priority in fuel treatment projects and work with the local and interagency fire departments for advice.
6.4.4	Each community should strive to encourage citizens with vulnerable considerations to register for assistance in the planning or 'Ready' stage (of the Ready, Set, Go program), a step that could very well mean survival when the emergency arrives.
6.4.5.1	During each community pre-season public wildfire awareness meeting, have an experienced wildfire person lead a discussion that includes survival techniques regarding temporary refuge areas in a possible compromised evacuation situation.
8	Communities each should establish a fuel treatment monitoring program to ensure that fuel treatment activities remain effective. This is also important for project implementation follow-up reporting to grantor (or other funding source representative), an important step when attempting to acquire additional funding for out-year projects. See *Section 8 – Monitoring* for suggested ideas for local CWPP treatment monitoring. Additional details can be found at: www.fs.fed.us/pnw/pubs/gtr526.

PROACTIVE
WILDLAND RESOURCES

Community Resilience Engagement

Who:

A small collaborative of local practitioners based in northern California, extensively versed in wildland fire/fuels management, forestry practices and technology.

What:

Engage citizens and interagency cooperators in wildland urban interface communities. Provide resources and tools to guide adaptive strategy and actions that will progressively increase neighborhood resilience in a wildfire environment.

Where:

Communities of California facing the 21st Century reality of increasing wildfire severity

When:

*Now more than ever. The 2017-2018 wildfire seasons in CA have clearly reinforced the fact that for our communities, the question of facing wildfire is **not if** but **when.***

Why:

As individuals, each of us in Proactive Wildland Resources has been affected by wildfire events recently or for some of us over the course of a lifetime career. Our common thread is the desire and will to move community conditions on a course that enables survival when they face the next wildfire.

Community Wildfire Protection Plan, Siskiyou County CA | Project Team Members

Jay Perkins: Wildland Fire Analysis
John Kessler: Forestry/Ecology
Julie Thrupp Titus: Wildland Fire/Fuels
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Sue Constantinides: Editor/Formatter

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PART II. PLANNING REGIONS (1-6)

1. **BUTTE VALLEY**
2. **MID-KLAMATH**
3. **SALMON**
4. **SCOTT VALLEY**
5. **SHASTA VALLEY**
6. **UPPER SACRAMENTO**

NOTE

Information provided in each PR contains wildfire assessment tools specific to communities within. The information may be referenced and further refined for utilization in local CWPP's, fire planning and project work.

Smaller reference maps are included within each PR's narrative section, with a complete set of larger-scale maps in Appendix H – Map Packet.

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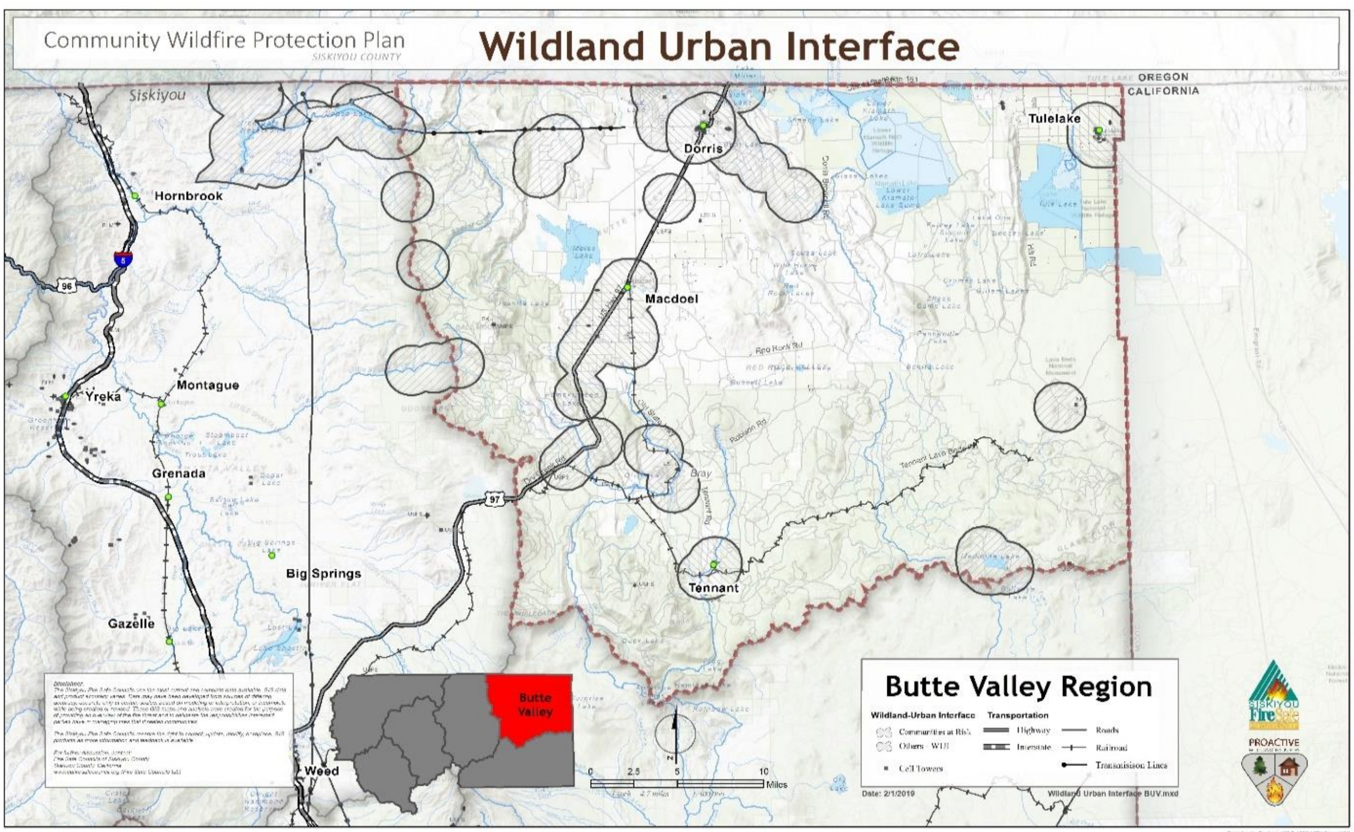
1. Butte Valley Planning Region

General Overview/Description

- The Butte Valley PR is a conglomeration of significant agricultural lands and forested lands that were heavily cut in the late 1800's. Much of the pine associations managed today are second or third growth forests.
- Dissected by Highway 97 - a major north-south route – and by a Union Pacific railroad line.
- Logging began in the early 1900s and continues to the present time.
- The eastern portion of the PR is high desert plateau.
- There are four identified Communities at Risk (CAR – see Section 4): Dorris, Tulelake, Macdoel, and Tennant.
    - Most residents in the PR are in the cities of Dorris, Tulelake, and Macdoel. Additional WUI Communities include Bray, Mt. Hebron, Medicine Lake, and Pleasant Valley. Approximate population in the PR is 3,413 (2010 Census, http://factfinder.census.gov).

Figure 1 - General Overview of the Butte Valley PR

Note: Federal and State of California listed Communities at Risk are annotated by name. WUIs not associated with a CAR are denoted with a number.



Values and Assets at Risk

- Medicine Lake, Juanita Lake, Orr Lake, Deer Mountain Snowmobile Park
- U.S. Highway 97, which is a major travel corridor for transport of goods as well as commuters and travelers and considered the most important N-S highway corridor in Oregon State.
- Union Pacific Railway, part of the major north/south rail transportation system.
- Proximity to Yreka makes the Butte Valley area a favorite firewood cutting area.
- Additional assets of significant value that could be threatened with destruction during a wildfire were identified by community members in public workshops and included: structures, residences, electrical power grid lines, parks, lakes, recreation sites, unique habitat for rare, threatened or endangered species, forest resources and cultural/historical sites.

Wildfire Environment

Effective fire suppression has excluded wildfire from most all of the plant associations found within the Butte Valley Planning Region (USDA 1996). High stocking levels (many more plants than would be found in a natural fire regime) now dominate the area and when conditions are right can create dramatic fire effects as seen by the Tennant Fire of 2009 and the Deer Fire in 2014. Both of these were lightning fires and closed down Highway 97 for brief periods of time.

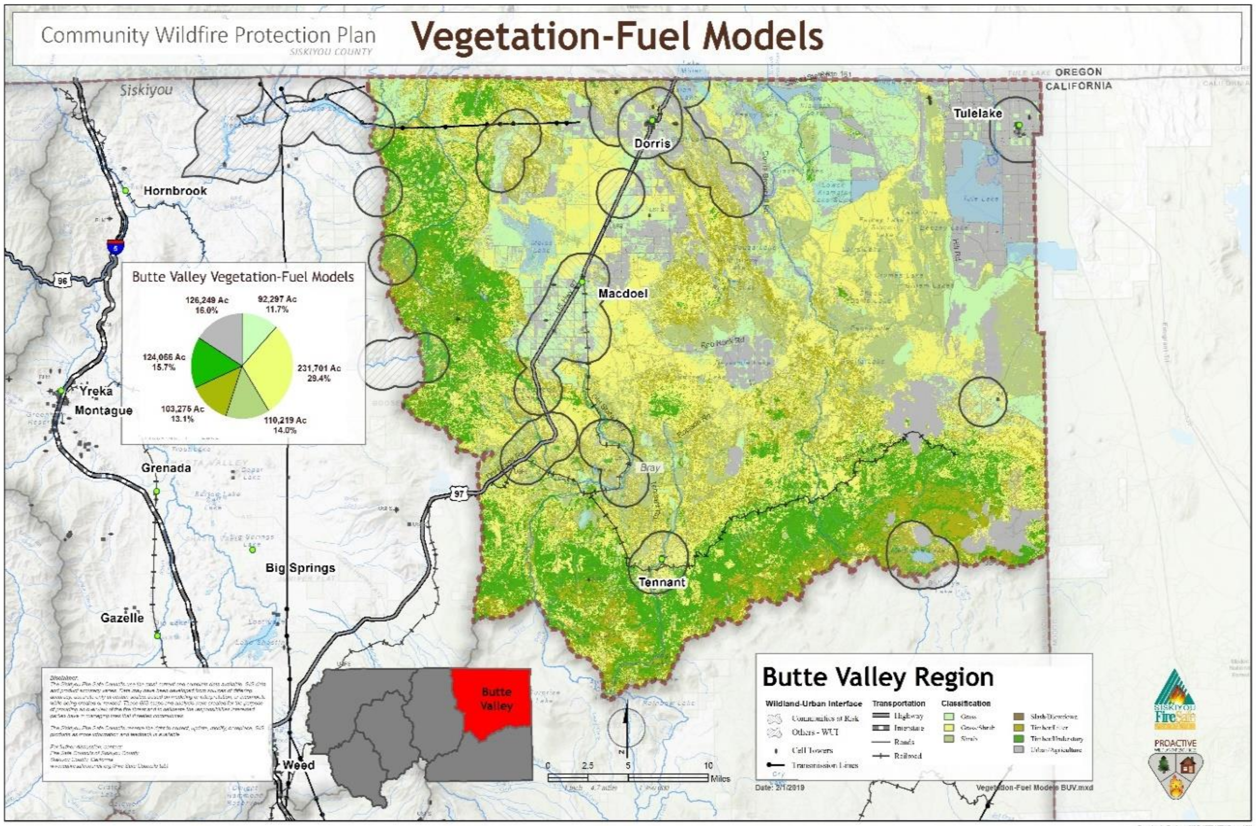
- The Butte Planning area is unique in all the PRs within the County as the predominant influence on fire spread and size is wind.

Fuels

IMPORTANT NOTE

Grass and shrub vegetation with lighter and faster burning fuels comprises approximately 55% of the Butte Valley area. Ignitions can quickly become fast moving infernos – as was experienced both 2014 Boles and 2018 Klamathon Fires, areas with similar fuel type.

Figure 2 - Vegetation as translated into major types of burnable vegetation or fuel model



Acres/% Acres of Primary Fuel Types - Butte Valley PR		
	Acres	% Acres
Grass	92,297	12%
Grass/Shrub	231,701	29%
Shrub	110,219	14%
Timber Litter	103,275	13%
Timber Understory	124,066	16%
Slash/Blowdown	-	0%
Non-burnable	126,249	16%
Total	**787,807**	**100%**

Weather

There are <u>three primary fire weather patterns</u> that can significantly affect fire behavior and natural ignitions in this northeastern area during the May-to-October fire season: (1) Pre-frontal Winds, (2) Lightning with Low Precipitation, and (3) Strong Subsidence/Low Relative Humidity patterns. *(Fire in California Ecosystems, Ch.13, p.220)*

- *Prefrontal wind events* are frequent in springtime and again in late summer and fall. They are of most consequence in the latter period, when both live and dead fuel moistures are low. This pattern usually occurs between 5 and 10 times a year, with one or two significant events during the fall season of most years. These conditions can lead to rapid fire spread and extreme fire behavior.

- *Lightning and low precipitation* pattern includes episodes of thunderstorms most common July to August but can occur from June through mid-September. The resulting cells have high bases and much of the precipitation associated with them evaporates before reaching the ground. 'Dry lightning' events often result in many fire ignitions over a relatively short time, a situation that can be rapidly compounded by the associated gusty erratic downdraft winds.
- *Strong Subsidence/Low Relative Humidity,* with enough duration, cause a significant increase in northeastern California fire potentials, even without much wind. The pattern occurs when a strong mid- and/or upper-level high pressure area is centered to the west of northeastern California for a period of at least several days. Daytime minimum RH usually drops to 4–12%, but nighttime recovery is very low, reaching only the 15–30% range. Dead fuel moistures drop, live fuels become more stressed, and fires ignite, spread, and spot more easily.

Topography

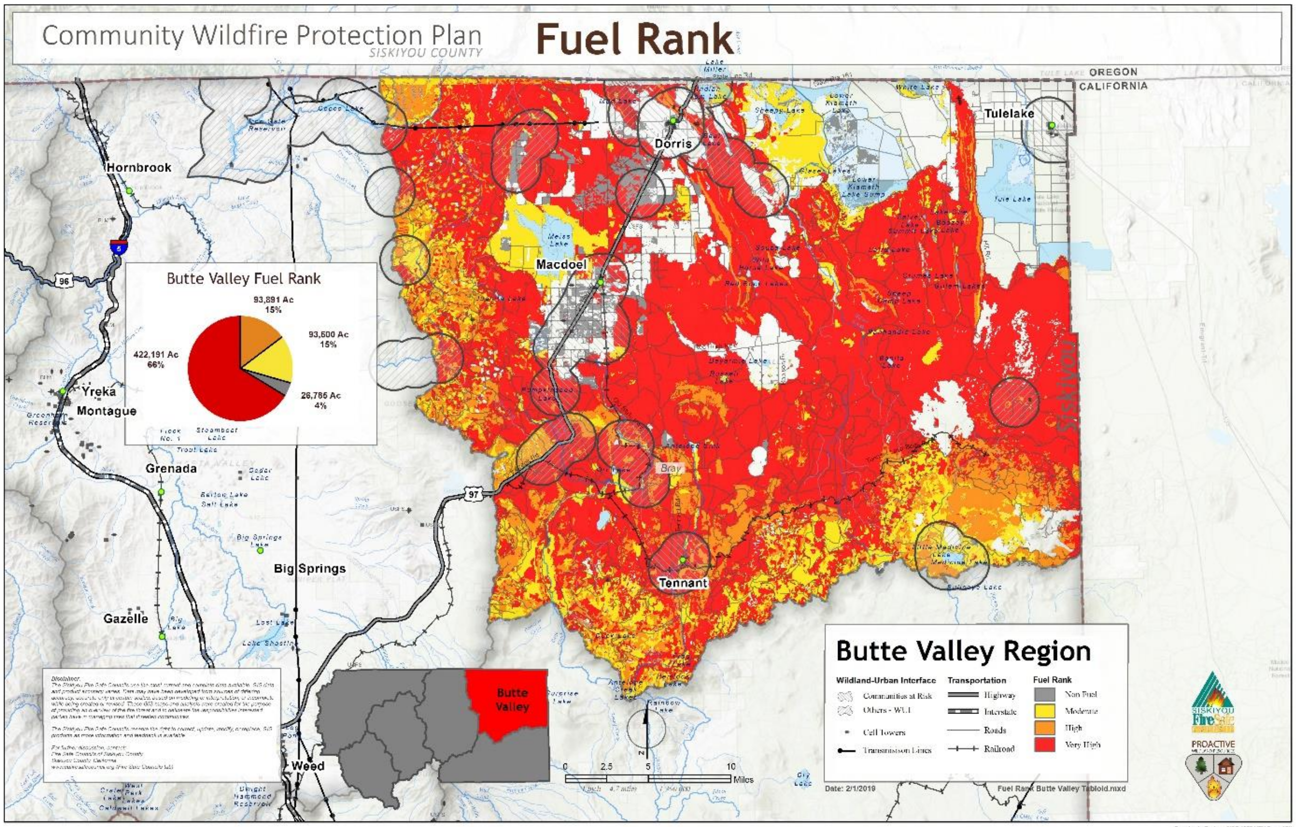
- Topographically, the area is noted for its vast grass/light shrubs valley areas bordered by unique volcanically formed butte features in the adjacent ridges surrounding the valleys.
- Elevation ranges from about 4,200 feet in the valley's floor to 8,500 at the top of Whaleback Mountain.

Expected Fire Behavior

Wildfires respond to wind and topography. The largest influence is wind. Wildfires can get large quickly primarily from downdrafts from lightning storms or strong prevailing winds. Typically, fires do not experience a long duration as found in the other Planning Regions primarily because of the lack of steep slopes and significantly heavier densities of fuels found in the Klamath or Salmon Planning Regions. Fuels are typically lighter and fires more easily suppressed especially in the lower and mid-slope areas of the region. The higher elevation true fir stands have heavier fuels and can be more problematic.

Figure 3 - Fuel Rank for Butte Valley PR

Note: Fuel Rank is based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, and temperature). This tool is used by CAL FIRE to prioritize pre-fire projects that reduce the potential for large, catastrophic wildfires. Fuel Rank does not factor in the likelihood of a fire event or fire frequency.



Fuel Rank Acres - Butte Valley PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Butte Valley	26,785	93,500	93,891	422,191	636,366

Percent Fuel Rank Acres - Butte Valley PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Butte Valley	4%	15%	15%	66%	100%

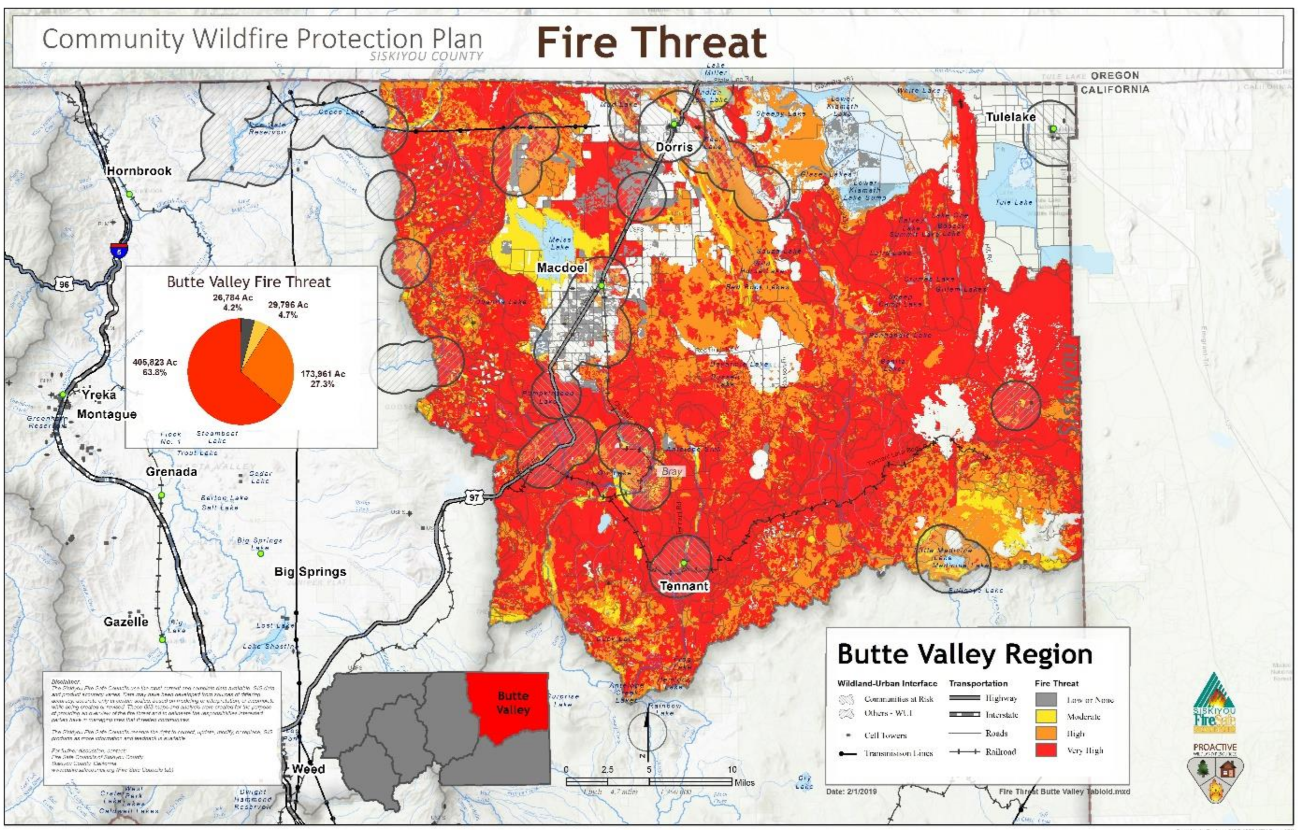
Communities at Risk: Fuel Rank Acres - Butte Valley PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total
Bray	4,951	28,527	7,180	11,615	**52,273**
Dorris	436	55	449	1,578	**2,518**
Macdoel	5,670	979	147	8,293	**15,088**
Tennant		156	1,278	5,241	**6,676**
Tulelake	16	41			**57**
Other WUI Total	4,261	7,979	7,798	33,438	**53,477**
Total All WUI	**15,334**	**37,737**	**16,852**	**60,166**	**130,089**

Communities at Risk: Percent Fuel Rank Acres - Butte Valley PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total
Bray	9%	55%	14%	22%	100%
Dorris	17%	2%	18%	63%	100%
Macdoel	38%	6%	1%	55%	100%
Tennant	0%	2%	19%	79%	100%
Tulelake	28%	72%	0%	0%	100%
Other WUI Total	8%	15%	15%	63%	100%
Total All WUI	12%	29%	13%	46%	100%

Wildland Fire Threat

Wildland Fire Threat is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes.

Figure 4 - Wildland Fire Threat for Butte Valley PR



Fire Threat Acres - Butte Valley PR					
	Low or None	Moderate	High	Very High	Total Result
Butte Valley	26,785	29,797	173,962	405,823	636,366

Percent Fire Threat Acres - Butte Valley PR					
	Low or None	Moderate	High	Very High	Total Result
Butte Valley	4%	5%	27%	64%	100%

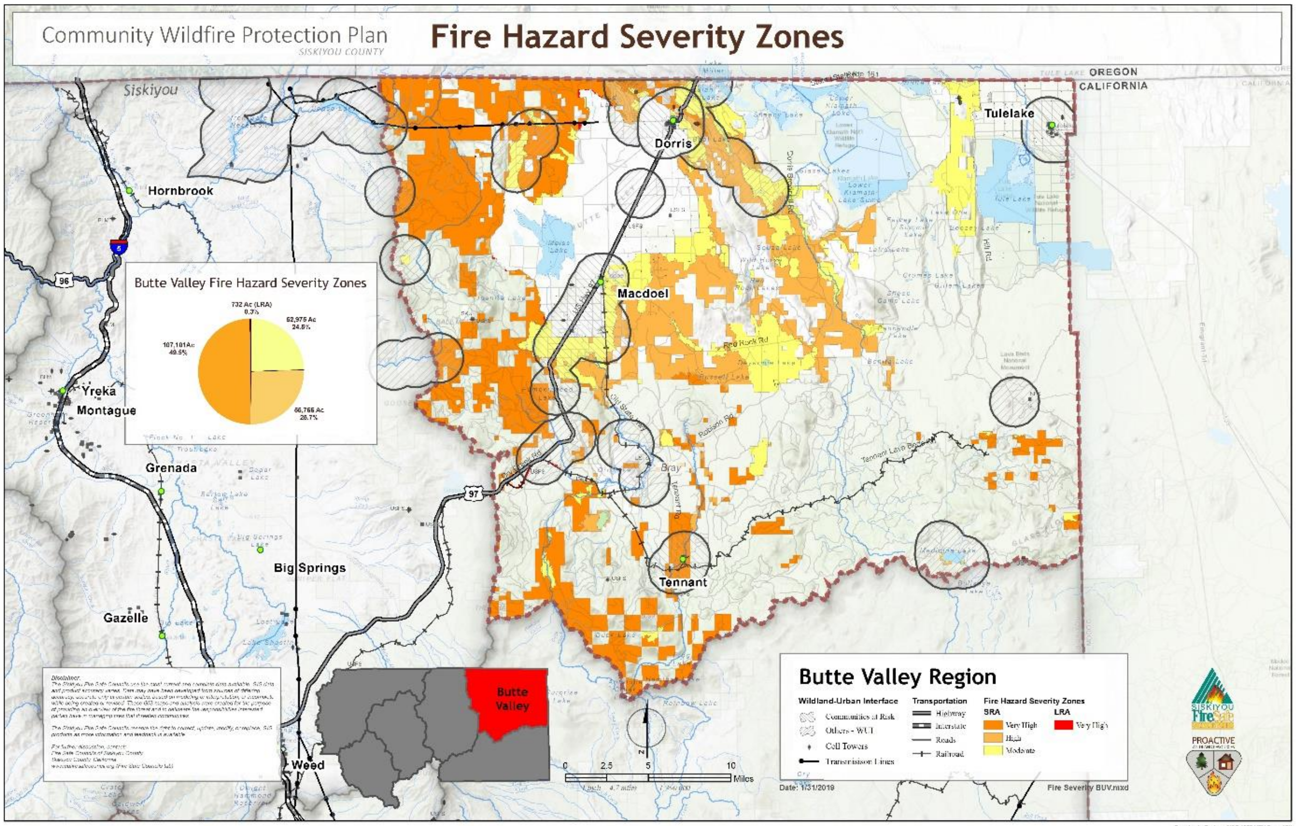
Community at Risk: Fire Threat Acres - Butte Valley PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Bray	4,951	28,774	12,203	6,345	52,273
Dorris	436	251	787	1,044	2,518
Macdoel	5,670	485	2,576	6,358	15,088
Tennant		89	165	6,422	6,676
Tulelake	16		41		57
Other WUI	4,261				4,261
Total All WUI	15,334	29,599	15,772	20,169	80,873

Community at Risk: Percent Fire Threat Acres - Butte Valley PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Bray	9%	55%	23%	12%	100%
Dorris	17%	10%	31%	41%	100%
Macdoel	38%	3%	17%	42%	100%
Tennant	0%	1%	2%	96%	100%
Tulelake	28%	0%	72%	0%	100%
Other WUI	100%	0%	0%	0%	100%
Total All WUI	19%	37%	20%	25%	100%

Wildland Fire Severity

Figure 5 - Fire Severity for Butte Valley Planning Region

Note: Fire Severity is a California State legislatively required fire behavior variable.

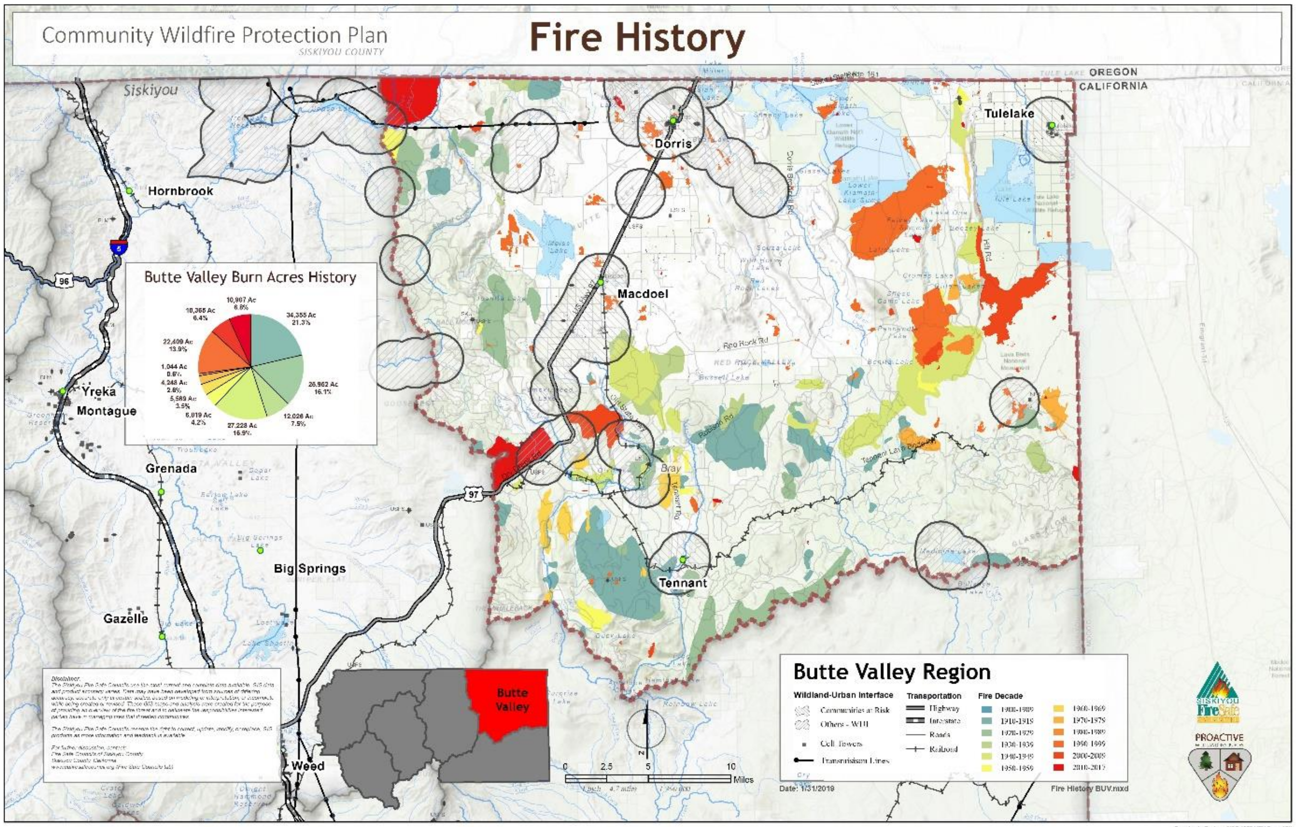


Severity Acres - Butte Valley PR				
Responsibility	Moderate	High	Very High-SRA / Very High-LRA	Total
State	52,975	55,766	107,101	215,842
Local			732	732

Percent Severity Acres - Butte Valley PR				
Responsibility	Moderate	High	Very High-SRA / Very High-LRA	Total
State	24%	26%	50%	100%
Local			100%	100%

Fire History

Figure 6 - Fire History Identified by decade (1900-2017) for Butte Valley Planning Region



Community Preparedness Aspects

Water sources in Butte Valley are critical in wildfire suppression actions. There are a few scattered well known (and mapped) year-round lakes; but there are also vast areas with no water when the intermittent stream corridors dry out, mid-late summer and into fall.

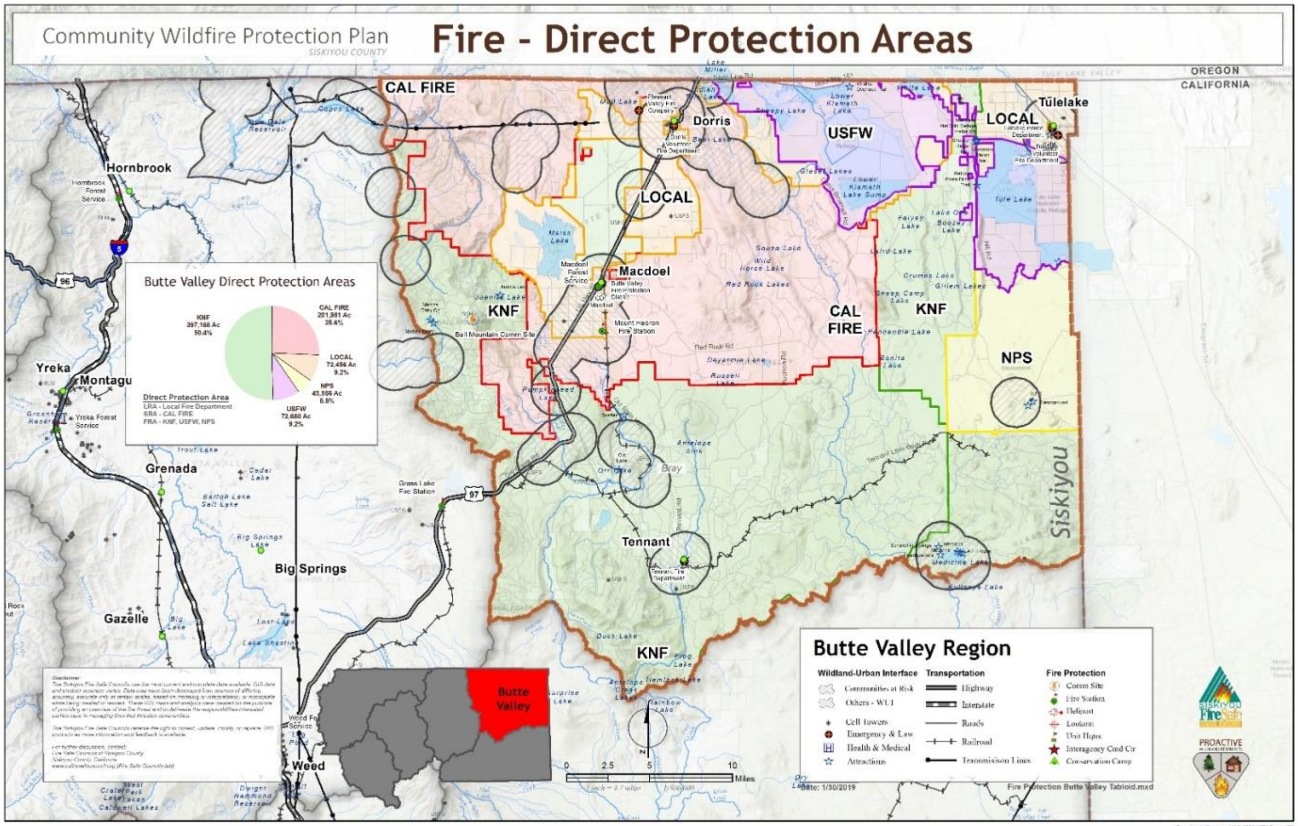
- It is important that fire suppression personnel and community members are fully aware of water sources; communicate with their local FSC's and fire departments about the locations; map them and be sure they are noted and kept current in their local level CWPPs.
- Communities not covered in local CWPP should be working directly with their area wildfire agency personnel to ensure all water sources are located and identified on a 'unit map' and updated regularly.

Descriptions and lists of activities and efforts by community citizens and groups to improve fire safety in their areas should be compiled for local Fire Safe Councils.

- Active Fire Safe Councils (FSCs) in this Planning Region
  - Butte Valley FSC
- For ongoing fuels reduction projects contact your local community FSC
- See Pre-Fire Projects – as listed in the CAL FIRE Siskiyou Unit Plan (Appendix E)

Wildfire Protection

Figure 7 - Fire Direct Protection Areas for Butte Valley Planning Region



- Wildland fire protection agencies/protection entities:
  - USFS Klamath NF: Goosenest Ranger District suppression resources include a Division Chief, 2 Battalion Chiefs (Suppression and Fuels), 2 engines (type 3), a Fire Prevention Officer, a Fuels technician, two 10 person fire crews, and multiple seasonal suppression resource employees.
  - CAL FIRE resources consist of a Battalion Chief, 3 engines (2 in Weed, 1 in Macdoel)
  - Community / volunteer fire departments: engines housed at each of the stations (Butte Valley FD, Dorris, Tulelake FD, Tennant FD, Pleasant Valley FD)
  - **NOTE:** Equipment & typical staffing/personal numbers will vary based on needs and funding *(refer to local CWPPs or call area representative wildfire protection agency for current/updated staffing info).*

- Primary concerns and challenges faced by protection forces:

#1 = Access-egress routes are amongst the highest priority safety elements in a wildfire emergency.

- Evacuation Route Mitigation Actions are a necessity for life safety of citizens and emergency personnel

  Evacuation route assessment should include, but is not limited to:

  - ✓ Roadbed width and adequate pullouts
  - ✓ Roadside vegetation clearance
  - ✓ Roadside power-pole and power line clearance
  - ✓ Signing of existing residence(s) on side roads
  - ✓ Clear marking of fire hydrant/water sources

IMPORTANT NOTE: Butte Valley PR leadership, citizens and interagency cooperators should expand on a list of challenges and mitigation actions in FSC level and/or local community level meetings. Larger scale maps can be reproduced to help identify primary evacuation routes for community awareness, education, and to incorporate priority fuels treatments into local CWPP Action plans.

Contact information for local fire protection services

State Resources

- **CAL FIRE Station Macdoel**:
  201 Meiss Lake Rd, Macdoel, CA 96058 | (530) 398-4331
  http://www.calfire.ca.gov/contacts/station?SID=749

Federal Resources

- **USFS Goosenest Ranger District Office:**
  37805 US-97, Macdoel, CA 96058 | (530) 398-4391
  https://www.fs.fed.us/organization/Goosenest%20Ranger%20District
  http://www.fs.usda.gov/klamath

Local Community & Volunteer Resources

- **Butte Valley Fire Protection District:**
  12320 Old State Hwy, Macdoel, CA 96058 | (530) 398-4332
  http://www.buttevalleyfire.org
- **Dorris Volunteer Fire Department:**
  307 S Main St, Dorris, CA 96023 | (530) 397-2121
- **Pleasant Valley Volunteer Fire Department:**
  2543 Durham Dr., Dorris, CA 96023 | (530) 397-3473
- **Tennant Fire Department:**
  13521 Tennant Rd, Macdoel, CA 96058 | (530) 398-4331 (MacDoel)

- **Tulelake Fire Department:**
  1 Ray Oehlerich Way, Tulelake, CA 96134 | (530) 667-2997

Evacuation

IMPORTANT EVACUATION INFORMATION:
Refer to Section 6.4 Evacuation for helpful pre-emergency tools, websites, and general procedures regarding area evacuations.

A map of primary roads identified for evacuation routes is an essential tool that should be developed at the local community level. The cartographic/GIS information for this road map information is provided on the FSCSC web site. Larger scale maps can be reproduced for use by community leadership and/or local FSCs. Local FSCs should make it a priority to identify main evacuation routes and prepare a local plan to reduce hazardous fuels along these routes so residents can evacuate safely and first responders/fire-fighting resources can safely access an area.

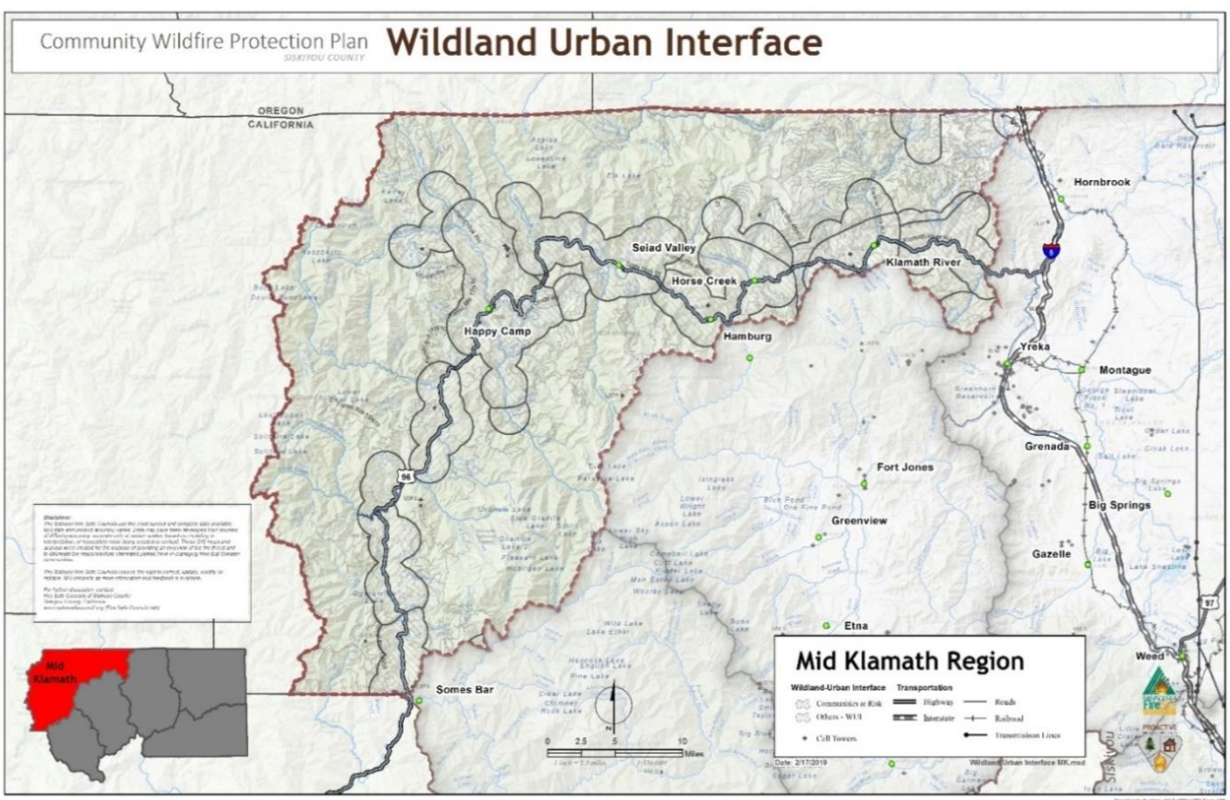
2. Mid-Klamath Planning Region

General Overview/Description

- The Mid-Klamath PR is the heart of Karuk Tribal Territory. They have lived along the Klamath River in small village sites since time immemorial.
- The region is heavily forested with significant timber production. The logging industry was an economic driver until the early to mid-1990's, but no timber mills remain within the PR.
- Prior to the timber industry, trapping and mining were draws to the area. Rumors of gold brought the first European settlers in the mid-1800's. A strong presence of mining claims remains along the Klamath River, Indian Creek and other water courses.
- The only major roadway is Highway 96, which parallels the Klamath River through the PR.
- The PR is topographically categorized by many water courses (rivers and streams) and the associated steep incised canyons prevalent throughout.
- There are six identified Communities at Risk (CAR – see Section 4): Klamath River, Horse Creek, Hamburg, Seaid Valley, Happy Camp, and Somes Bar.
- Most residents in the region are in the towns of Happy Camp, Seaid, Hamburg, Horse Creek, Klamath River and Scott Bar (also partly in Scott Valley PR). Additional notable populations extend along the Klamath River and almost all its major tributaries.
    - Approximate population in the PR is 2,888 (2010 Census, http://factfinder.census.gov, ZIP Codes for Happy Camp, Seaid, Klamath River and Scott Bar).

Figure 1 - General Overview of the Mid-Klamath Planning Region

Note: Federal and State of California listed Communities at Risk are annotated by name.



Values and Assets at Risk

- The Klamath River is a National designated Wild and Scenic River (www.rivers.gov). As such, there are innumerable river access points, vista points and areas of dispersed camping and recreation associated with it, and it provides innumerable economic opportunities.
- U.S. Highway 96 is the major travel corridor for transport of goods as well as commuters and travelers. It parallels the Klamath River throughout the entire PR, starting at the confluence of the Klamath and Shasta rivers at Highway 263 and stretching west and south to Willow Creek in Humboldt County.
- Happy Camp Airport.
- Additional assets of significant value that could be threatened with destruction during a wildfire were identified by community members in public workshops and included: structures, residences, electrical power grid lines, parks, lakes, recreation sites, unique habitat for rare, threatened or endangered species, forest resources; cultural/historical sites.

Wildfire Environment

For CWPP assessment purposes, the Mid-Klamath PR was split into two sub-regions along a divide where the river bends from a north-south orientation to an east-west orientation. Given the large expanse of the Mid-Klamath PR and the expected fire behavior diversity within, the region was sub-divided along the ridge separating Seiad Creek and Thompson Creeks and across the Klamath River along the divide west of Grider Creek. This division was incorporated to improve assessment work due to the large size and notably varied wildfire behavior and fire ecology across the PR. Several tables that follow will permit the reader to look at the differences between the two sub-regions with respect to fuels/vegetation, fuel rank (fire behavior) and fire threat.

The Mid-Klamath PR had been included with the damper Pacific Northwest fire regimes until the ground-breaking study by Taylor and Skinner (1998). The 1987 fire season was a game changer in the consideration of the role of wildfire. They found that fire had been a more frequent visitor to the greater Klamath Province than originally thought. Their research found that fire frequented the landscape approximately every 12 to 19 years. Effective fire suppression has excluded wildfire from most of the plant associations. High stocking levels (many more plants than found in a natural fire regime) now dominate the area. Wildfire has burned repeatedly since 1987.

Significant contributing factors to large fire spread include:

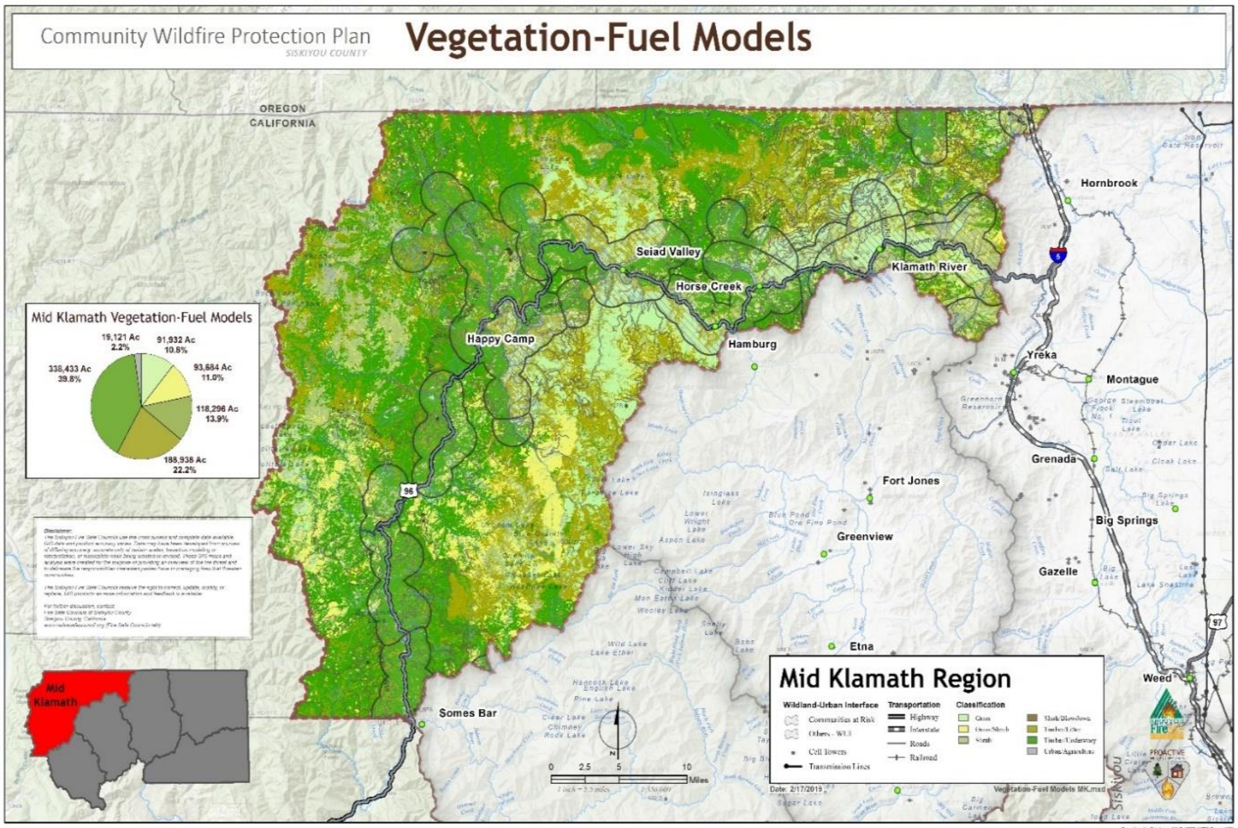
- Steep slopes associated with the Klamath River system.
- Fuel accumulation along with the steep slopes.
- Often very difficult access for suppression resources.

Fuels

IMPORTANT NOTE

Grass and shrub vegetation with lighter and faster burning fuels comprises approximately 47% of the Mid-Klamath-East area. 67% of Mid-Klamath-West is comprised of timber related fuel types which can create longer duration fires.

Figure 2 - Vegetation as translated into major fuel or vegetation types of burnable vegetation.



Acres/% Acres of Primary Fuel Types - Mid-Klamath PR						
	Mid-Klamath East		Mid-Klamath - West		Mid-Klamath Total	
	Acres	% Acres	Acres	% Acres	Acres	% Acres
Grass	61,000	21%	30,932	6%	91,932	11%
Grass/Shrub	34,694	12%	58,990	11%	93,684	11%
Shrub	40,403	14%	77,892	14%	118,295	14%
Timber Litter	67,072	23%	121,866	22%	188,938	22%
Timber Understory	86,833	29%	251,600	45%	338,433	40%
Slash/Blowdown	1	0%	4	0%	5	0%
Non-burnable	6,383	2%	12,738	2%	19,121	2%
Total	**296,386**	**100%**	**554,023**	**100%**	**850,408**	**100%**

Weather

Weather is marked by very hot summer days, being shielded in the valley behind the mountains from the cooling Pacific influence affecting nearby coastal locations. The winters are much cooler and snowier than in inland locations further south, albeit still very mild compared to areas to the east of the continent. The dry and hot summers make the surrounding forest prone to wildfires which recent history demonstrates that they can burn for months. The high winter rainfall however, keeps the area greener than its summer climate would suggest. Average lows remain cool year-round, relieving the intense daytime heat and keeping the average July temperature at around 73 °F (23 °C) in sharp contrast to the 95 °F (35 °C) average highs. (Wikipedia, 2019)

Critical fire weather in the Klamath Mountains is associated with any weather condition that creates sustained periods of high velocity winds with low humidity. Following are three important weather patterns: (1) Pacific High, Postfrontal (Postfrontal), (2) Pacific High, Prefrontal (Pre-frontal), and (3) Subtropical High Aloft (Subtropical High). (Fire in California Ecosystems, 2018)

- *Postfrontal* conditions occur when high pressure following the passage of a cold front causes strong winds from the north and northeast. Temperatures rise and humidity declines with these winds.
- *Prefrontal* conditions occur when strong, southwesterly or westerly winds are generated by the dry, southern tail of a rapidly moving cold front. Strong winds are the key here because temperatures usually drop and relative humidity rises. These strong Prefrontal winds are able to spread fires rapidly.
- *Subtropical High* conditions occur when the region is under the influence of high pressure that causes temperatures to rise and humidity to drop. In this bioregion, these conditions lead to fires controlled mostly by local topography. Subtropical High conditions promote the development of strong temperature inversions that inhibit smoke from venting out of the canyons and valley bottoms leaving only the ridge tops in full sun. Fires burning above the inversion layer and immediately after dissipation of the inversion, especially when accompanied by strong winds, can produce large areas of high severity (Weatherspoon and Skinner 1995).

Lightning is common in the Klamath Mountains. Lightning-caused fires have accounted for most area burned in recent decades (for example, 1977, 1987, 1999, 2002, 2006, 2008, 2012, and 2014). Large number of simultaneous ignitions combined with poor access for fire-suppression forces, steep topography, and extensive strong canyon inversions (see above) generate widespread lightning fires that often burn for weeks to months over large areas (e.g., Estes et al. 2017). Storms producing lightning-caused fires are associated with higher instability and drier air than storms that produce the most lightning strikes. In each of the years 1987, 1999, 2008, and 2012, a single storm episode was responsible for nearly all of the area burned by lightning-caused fires. The contribution of lightning-caused fires to total area burned has increased from 42% to 87% over the last century while the annual area and sizes of fires have significantly increased (Miller et al. 2012a).

Topography

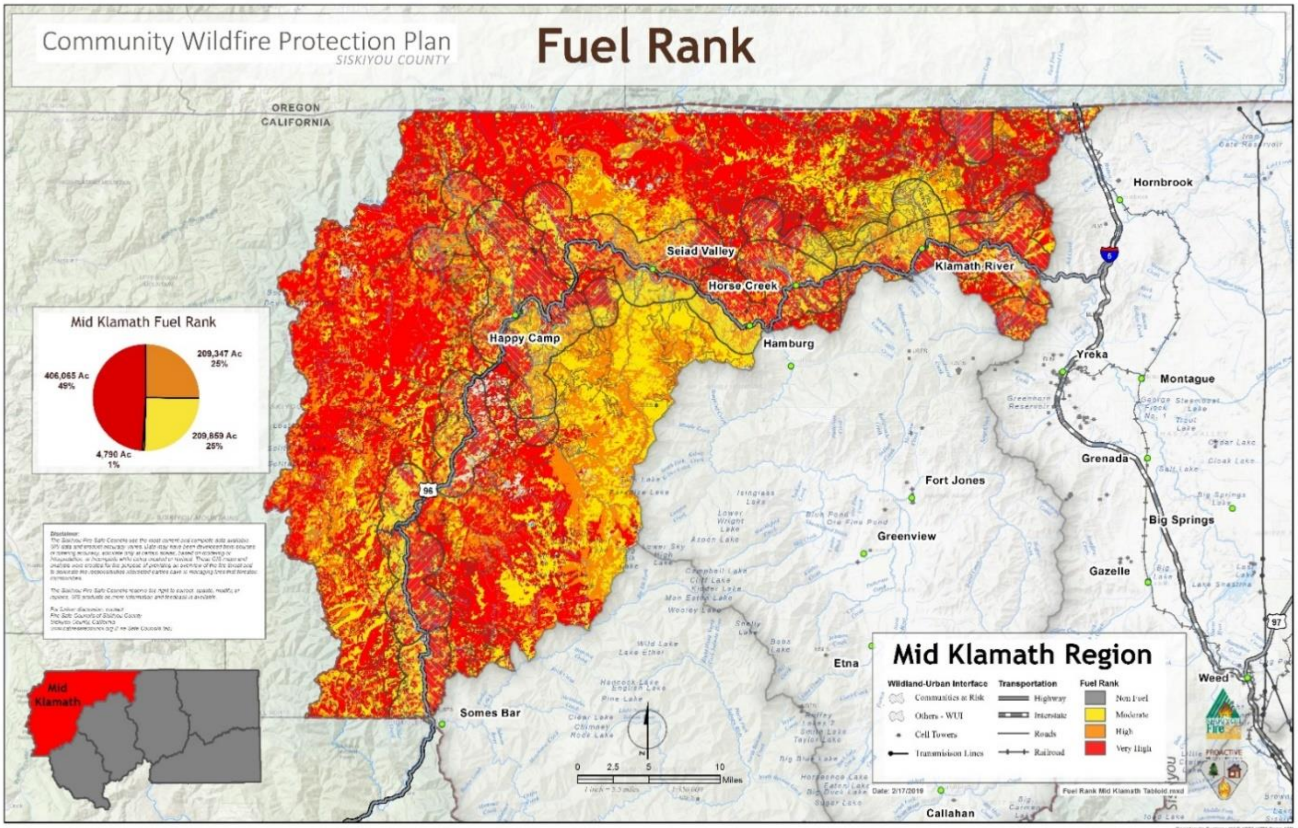
- The topography of the Mid-Klamath Region is defined by its major rivers and streams. The corresponding slopes that run into the waterways are steep and quite rugged. The steep slopes provide for a constant effect on fire behavior as the slopes significantly influence fire spread (fires spread more rapidly on steep slopes).
- Elevation ranges from about 440 feet at the confluence of the Salmon and Klamath Rivers near Somes Bar to the top of Preston Peak west of Happy Camp which tops out at 7,309 feet.
- The north-south configuration of the Klamath River in the Mid-Klamath-West funnels the daily diurnal winds growing strongest by early afternoon. The eastern portion of the Mid-Klamath or the Mid-Klamath East the Klamath River takes a major change to an west-east direction/orientation. Canyon winds follow the river changing direction and become strongest by mid-afternoon during the peak of summertime heating.
- The steep incised canyons set up dominant inversions during major fire events. The deeply incised canyons block the general winds, hence reducing the likelihood of the winds scouring the some away.

Expected Fire Behavior

The eastern up-river portion is slightly drier as represented by more of a pine and brush type fuel. Fuels will be typically lighter (grass to shrub, more open canopy forests). The canyon (river) winds, which are the dominant wind flow, exhibit an east-west orientation for. The western portion of the Mid-Klamath finds the river running in a north-south orientation. The downriver or western fuels are dominated by a mixed conifer, more closed stands of vegetation, dominated by Douglas-fir vegetation types. These noticeably heavier fuels (on top of steeper topography) provide a more difficult fire environment for firefighters to be successful. These heavier fuels also tend to smolder or burn longer generating more smoke over longer periods of time; exacerbated by the inversions that hold smoke in valleys over long periods of time.

Figure 3 - Fuel Rank Mid-Klamath PR

Note: Fuel Rank is based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, and temperature). This tool is used by CAL FIRE to prioritize pre-fire projects that reduce the potential for large, catastrophic wildfires. Fuel Rank does not factor in the likelihood of a fire event or fire frequency.



Fuel Rank Acres - Mid-Klamath PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Mid-Klamath East	1,521	88,596	66,495	132,283	288,895
Mid-Klamath-West	3,269	121,263	142,852	273,783	541,167
Total Result	**4,790**	**209,859**	**209,347**	**406,065**	**830,062**

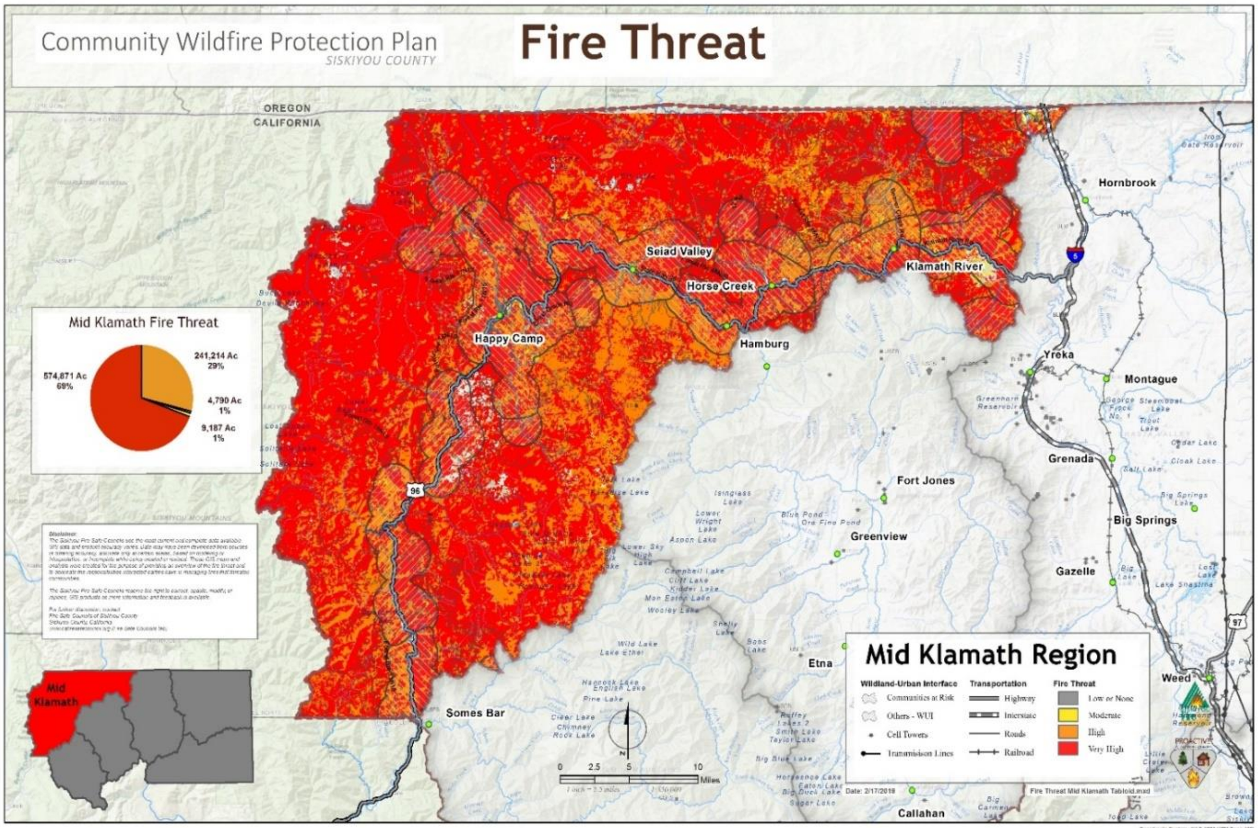
Percent Fuel Rank Acres - Mid-Klamath PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Mid-Klamath East	1%	31%	23%	46%	100%
Mid-Klamath-West	1%	22%	26%	51%	100%
Total Result	**1%**	**25%**	**25%**	**49%**	**100%**

Communities at Risk: Fuel Rank Acres - Mid-Klamath PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total
Colestine	12	625	809	5,837	**7,283**
Hamburg	536	9,583	7,087	12,800	**30,006**
Happy Camp	499	13,658	12,093	20,008	**46,258**
Horse Creek	209	4,672	4,297	3,998	**13,176**
Klamath River	150	5,026	4,255	9,530	**18,961**
Seiad Valley	474	12,912	10,425	15,035	**38,846**
Somes Bar	16	3,865	2,171	5,636	**11,888**
Yreka Humbug		889	1,476	3,213	**5,578**
Other WUI Total	66,295	184,509	70,828	311,568	**633,200**
Total All WUI	**68,391**	**235,739**	**113,442**	**387,624**	**805,197**

Communities at Risk: Percent Fuel Rank Acres - Mid-Klamath PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total
Colestine	0%	9%	11%	80%	**100%**
Hamburg	2%	32%	24%	43%	**100%**
Happy Camp	1%	30%	26%	43%	**100%**
Horse Creek	2%	35%	33%	30%	**100%**
Klamath River	1%	27%	22%	50%	**100%**
Seiad Valley	1%	33%	27%	39%	**100%**
Somes Bar	2%	33%	18%	47%	**100%**
Yreka Humbug	0%	16%	26%	58%	**100%**
Other WUI Total	10%	29%	11%	49%	**100%**
Total All WUI	**8%**	**29%**	**14%**	**48%**	**100%**

Figure 4 - Wildland Fire Threat for Mid-Klamath Region

Note: Wildland Fire Threat is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes.



Fire Threat Acres - Mid-Klamath PR					
	Low or None	Moderate	High	Very High	Total Result
Mid-Klamath East	1,521	6,541	99,412	181,421	**288,895**
Mid-Klamath West	3,269	2,646	141,802	393,450	**541,167**
Total	**4,790**	**9,187**	**241,214**	**574,871**	**830,062**

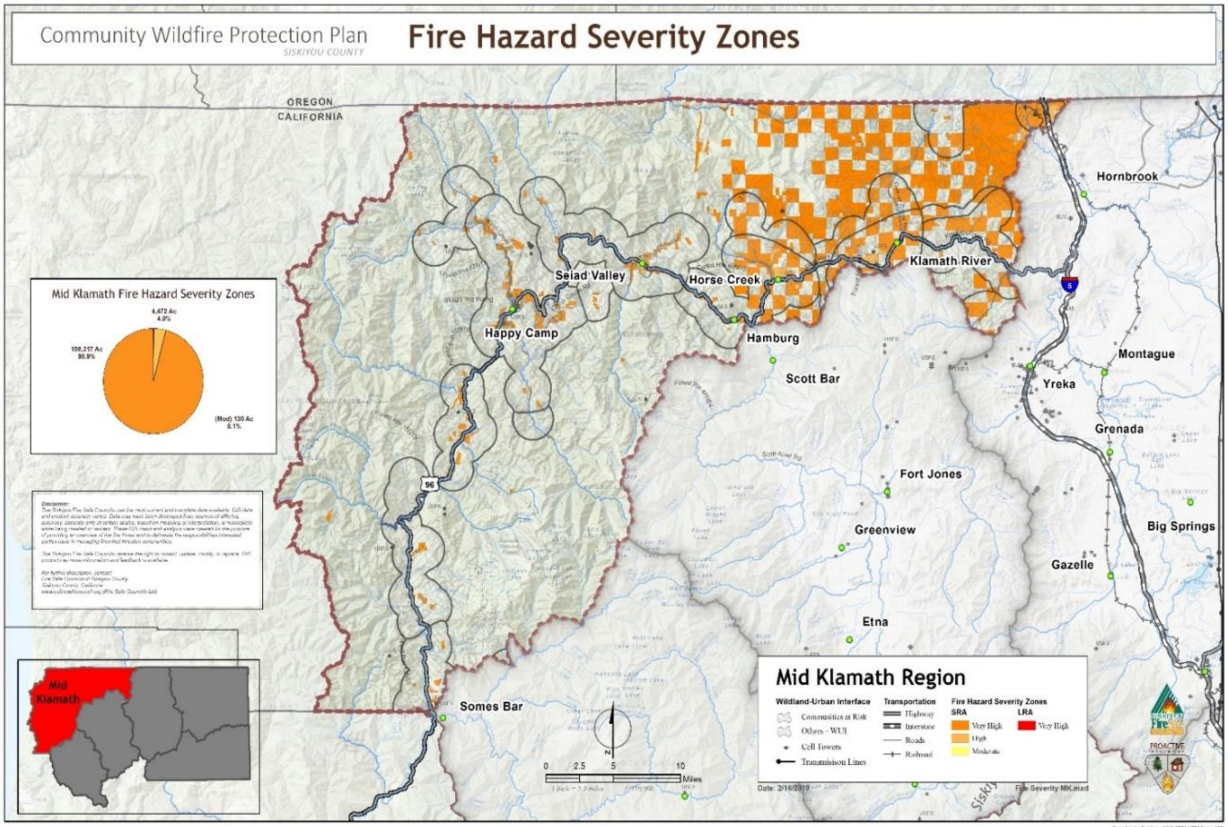
Percent Fire Threat Acres - Mid-Klamath PR					
	Low or None	Moderate	High	Very High	Total Result
Mid_Klamath East	1%	2%	34%	63%	**100%**
Mid-Klamath West	1%	0%	26%	73%	**100%**
Total	**1%**	**1%**	**29%**	**69%**	**100%**

Community at Risk: Fire Threat Acres - Mid-Klamath PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Colestine	12	4	631	6,636	**7,283**
Hamburg	536	284	11,135	18,051	**30,006**
Happy Camp	499	806	16,736	28,217	**46,258**
Horse Creek	209	802	5,817	6,348	**13,176**
Klamath River	150	1,150	6,404	11,257	**18,961**
Seiad Valley	474	335	15,113	22,924	**38,846**
Somes Bar	216	70	4,890	6,712	**11,888**
Yreka Humbug		15	1,255	4,308	**5,578**
Other WUI	66,295	202,489	313,938	50,479	**633,200**
Total All WUI	**68,391**	**205,956**	**375,919**	**154,931**	**805,197**

Community at Risk: Percent Fire Threat Acres - Mid-Klamath PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Colestine	0%	0%	9%	91%	100%
Hamburg	2%	1%	37%	60%	100%
Happy Camp	1%	2%	36%	61%	100%
Horse Creek	2%	6%	44%	48%	100%
Klamath River	1%	6%	34%	59%	100%
Seiad Valley	1%	1%	39%	59%	100%
Somes Bar	2%	1%	41%	56%	100%
Yreka Humbug	0%	0%	23%	77%	100%
Other WUI	10%	32%	50%	8%	100%
Total All WUI	**8%**	**26%**	**47%**	**19%**	**100%**

Wildland Fire Severity

Figure 5 - Fire Severity is a California State legislatively required fire behavior variable



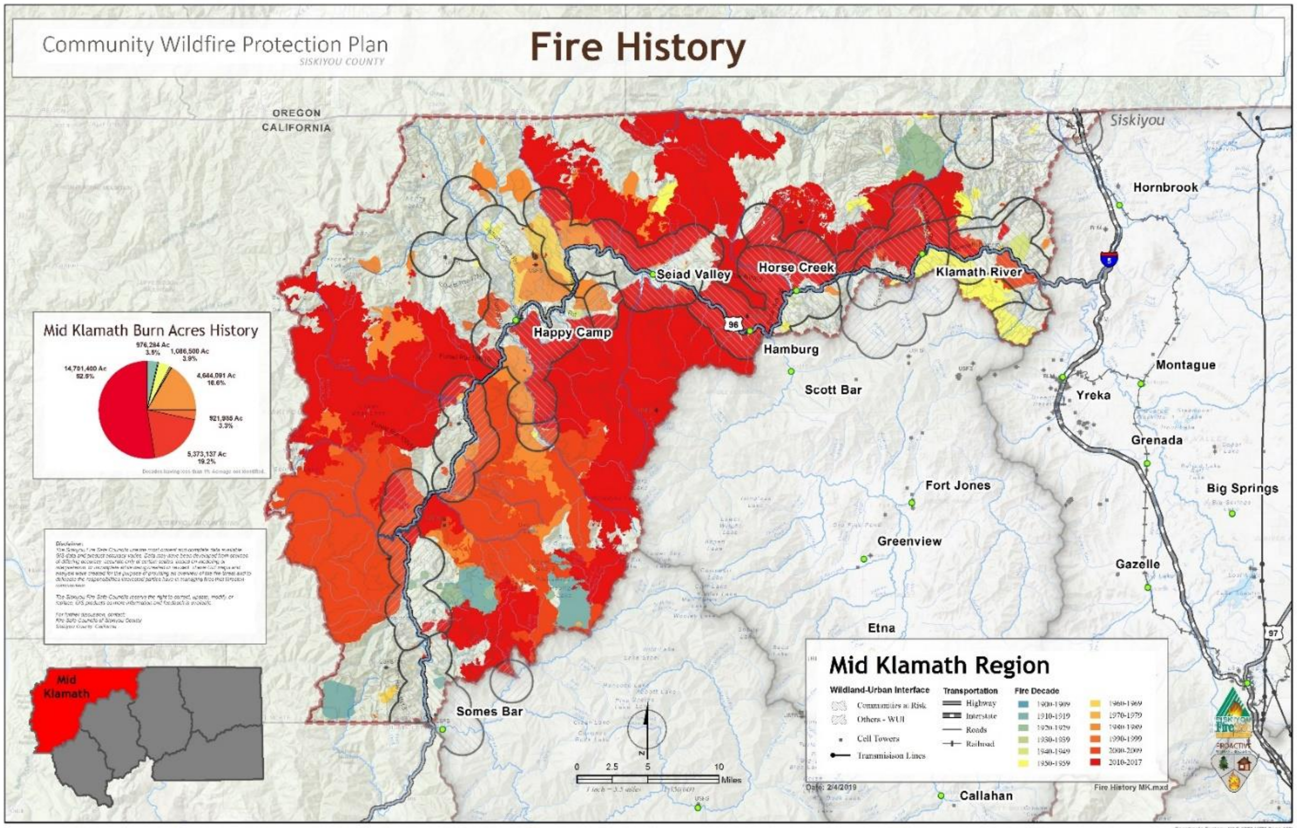
The trailing two tables display the fire severity classifications as required by State law and determined by CAL FIRE. The State of California is responsible for wildland suppression activities on privately owned parcels within State Responsibility Areas and local jurisdictions are responsible within the Local Responsibility Area.

Severity Acres - Mid-Klamath PR				
Responsibility	Moderate	High	Very High-SRA Very High-LRA	Total
State	130	4,472	108,317	112,918
Local			41	41

Severity Acres by % Acres - Mid-Klamath PR				
Responsibility	Moderate	High	Very High-SRA Very High-LRA	Total
State	0%	4%	96%	100%
Local			100%	100%

Fire History

Figure 6 - Fire History – Identified by decade (1900-2017); Mid-Klamath PR



Community Preparedness Aspects

Water sources in the Mid-Klamath area are critical in wildfire suppression actions. There are well known (and mapped) year-round lakes and perennial water courses.

- It is important that fire suppression personnel and community members are fully aware of water sources; communicate with their local FSC's and fire departments about the locations; map them and be sure they are noted and kept current in local level CWPPs.
- Communities not covered in local CWPP should be working directly with their area wildfire agency personnel to ensure all water sources are located and identified on a 'unit map' and updated regularly.

Descriptions and lists of activities and efforts by community citizens and groups to improve fire safety in their areas should be compiled by local Fire Safe Councils.

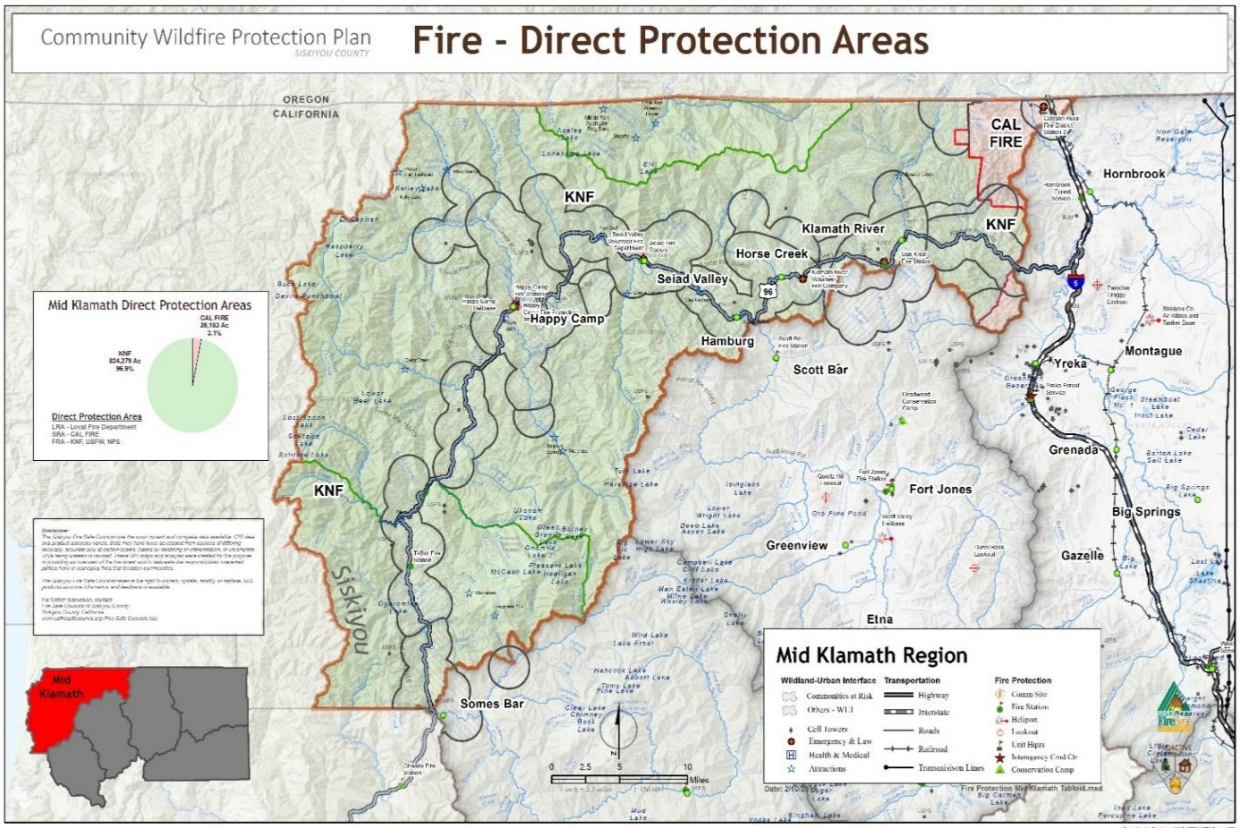
- Active Fire Safe Councils (FSCs)
  - Happy Camp FSC
  - Klamath River FSC
  - Orleans/Somes Bar FSC
  - Scott Bar FSC
  - Seiad Valley FSC

- Pre-Fire Projects – as listed in CAL FIRE Siskiyou Unit (see *Appendix E*)

Wildfire Protection

The wildland fire suppression in the Mid-Klamath Region is almost entirely the responsibility of Federal resources, except for a small portion in the extreme northeast area of the Region. Though there are private lands that by law the CAL FIRE must protect, the CFMA includes these private lands in the trade-off for efficiency purposes.

Figure 7 - Fire Direct Protection Areas for Mid-Klamath PR



- Wildland fire protection agencies/protection entities:
  - USFS Klamath NF: Happy Camp Battalion: suppression resources include a Division Chief, 2 Battalion Chiefs (Suppression and Fuels), 2 engines (type 3), a Fire Prevention Officer, a Fuels technician, a 20-person T2IA fire crews, a T3 helicopter at the Happy Camp Helibase, and multiple seasonal suppression resource employees.
  - Community / volunteer fire departments: engines housed at each of the stations (Orleans/Somes Bar, Happy Camp, Seaid Valley, Klamath River Volunteer Fire Departments.
  - **NOTE:** Equipment & typical staffing/personal numbers will vary based on needs and funding *(refer to local CWPPs or call area representative wildfire protection agency for current/updated staffing info)*

- Primary concerns and challenges faced by protection forces:

#1 = Access-egress routes are amongst the highest priority safety elements in a wildfire emergency.

- Evacuation Route Mitigation Actions are a necessity for life safety of citizens and emergency personnel

  Evacuation route assessment should include, but is not limited to:

  - ✓ Roadbed width and adequate pullouts
  - ✓ Roadside vegetation clearance
  - ✓ Roadside power-pole and power line clearance
  - ✓ Signing of existing residence(s) on side roads
  - ✓ Clear marking of fire hydrant/water sources

IMPORTANT NOTE: Mid-Klamath PR leadership, citizens and interagency cooperators should expand on a list of challenges and mitigation actions in FSC level and/or local community level meetings. Larger scale maps can be reproduced to help identify primary evacuation routes for community awareness, education, and to incorporate priority fuels treatments into local CWPP Action plans.

Contact information for local fire protection services:

State Resources

- **CAL FIRE Station**:
  CAL FIRE Siskiyou Unit – Hornbrook, 14638 Bradley Henley Rd., Hornbrook, CA 96044 | (530) 475-3582

Federal Resources

- **USFS Happy Camp Ranger District Office:**
  63822 ST HWY 96, Happy Camp, CA 96039 | (530) 493-2243
  http://www.fs.usda.gov/klamath
- **USFS Happy Camp Ranger District, Oak Knoll Work Center:**
  PO Box 10, Klamath River, CA 96050| (530) 465-1505
  http://www.fs.usda.gov/klamath

Local & Volunteer Resources

- **Happy Camp Fire Protection District:**
  26 Fourth Ave., Happy Camp, CA 96039 | (530) 493-2643
  http://www.happycampambulance.com/
- **Klamath River Volunteer Fire Company:**
  30330 Walker Rd, Klamath River, CA 96050-9033| (530) 496-3546
  https://www.klamathriverfire.org/

- **Orleans Volunteer Fire Department:**
  38162 Highway 96, (PO Box 312), Orleans, California 95556 | (530) 627-3344
  https://www.orleansvfd.org/
- **Seaid Volunteer Fire Department:**
  44601 Highway 96, Seiad Valley CA 96086 | 530-496-3164

Evacuation

IMPORTANT EVACUATION INFORMATION:
Refer to Section 6.4 Evacuation for helpful pre-emergency tools, websites, and general procedures regarding area evacuations.

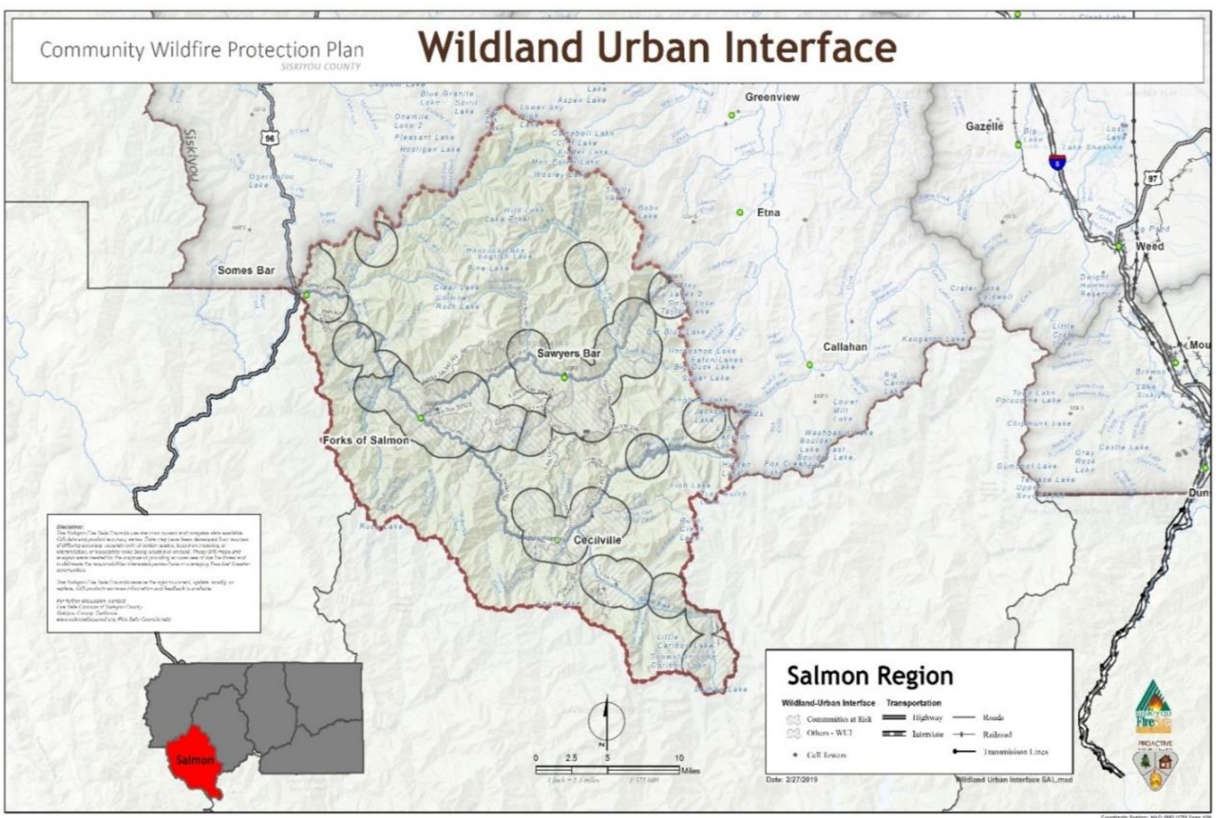
A map of primary roads identified for evacuation routes is an essential tool that should be developed at the local community level. The cartographic/GIS information for this road map information is provided on the FSCSC web site. Larger scale maps can be reproduced for use by community leadership and/or local FSCs. Local FSCs should make it a priority to identify main evacuation routes and prepare a local plan to reduce hazardous fuels along these routes so residents can evacuate safely and first responders/fire-fighting resources can safely access an area.

General Overview/Description

- The Salmon River is known for its crystal-clear waters that attract whitewater river rafting, fishing, and other river-centric activities.
- 98.7% of the watershed is public lands, with 45% within the following designated wilderness areas: Marble Mountain, Trinity Alps, and Russian.
- The region is heavily forested with significant timber production. Logging activity began in the early 1900s, peaked in the late 1980's, and continues to the present. Rumors of gold brought the first European settlers in the mid-1800's. Today there is still a strong presence of mining claims.
- The Region is topographically categorized by the many water courses (rivers and streams) and the associated steep incised canyons prevalent throughout.
- There are four identified Communities at Risk (CAR – see Section 4): Forks of Salmon, Sawyers Bar, Cecilville and portions of Somes Bar.
- Most residents in the region live in the aforementioned communities, with additional populations primarily along the Salmon River and most of her major tributaries.
    - Approximate population in the PR is 158 (2010 Census, http://factfinder.census.gov, Zip Code for Forks of Salmon).

Figure 1 - General Overview of the Salmon PR

Note: Federal and State of California listed Communities at Risk are annotated by name.



Values and Assets at Risk

- The Salmon River is a famously favorite river for anglers and river recreationist. As such there are innumerable river access points, vista points and areas of dispersed camping and recreation associated with the Salmon River.
- The Salmon River Road is the major travel corridor for transport of goods as well as commuters and travelers. The road parallels the Salmon River to Forks of Salmon and then forks and follows each fork of the Salmon River: the south fork going through Cecilville and spilling out into Callahan; and the north fork going through Sawyers Bar and terminating in Etna.
- Assets of significant value that could be threatened with destruction during a wildfire were identified by community members in public workshops and included: structures, residences, electrical power grid lines, parks, lakes, recreation sites, unique habitat for rare, threatened or endangered species, forest resources and cultural/historical sites.

Wildfire Environment

The Salmon PR, much like the Klamath River country had been included in the damper Pacific Northwest fire regimes until the ground-breaking study by Taylor and Skinner (1998). The 1987 fire season was a game changer in the consideration of the role of wildfire. They found that fire had been a more frequent visitor to the greater Klamath Province than originally thought. Their research found that fire frequented the landscape anywhere where from every 12 to 19 years. Effective fire suppression has excluded wildfire from most all of the plant associations. High stocking levels (many more plants than would be found in a natural fire regime) now dominate the area. Wildfire has burned repeatedly since 1987.

Significant contributing factor to large fire spread is:

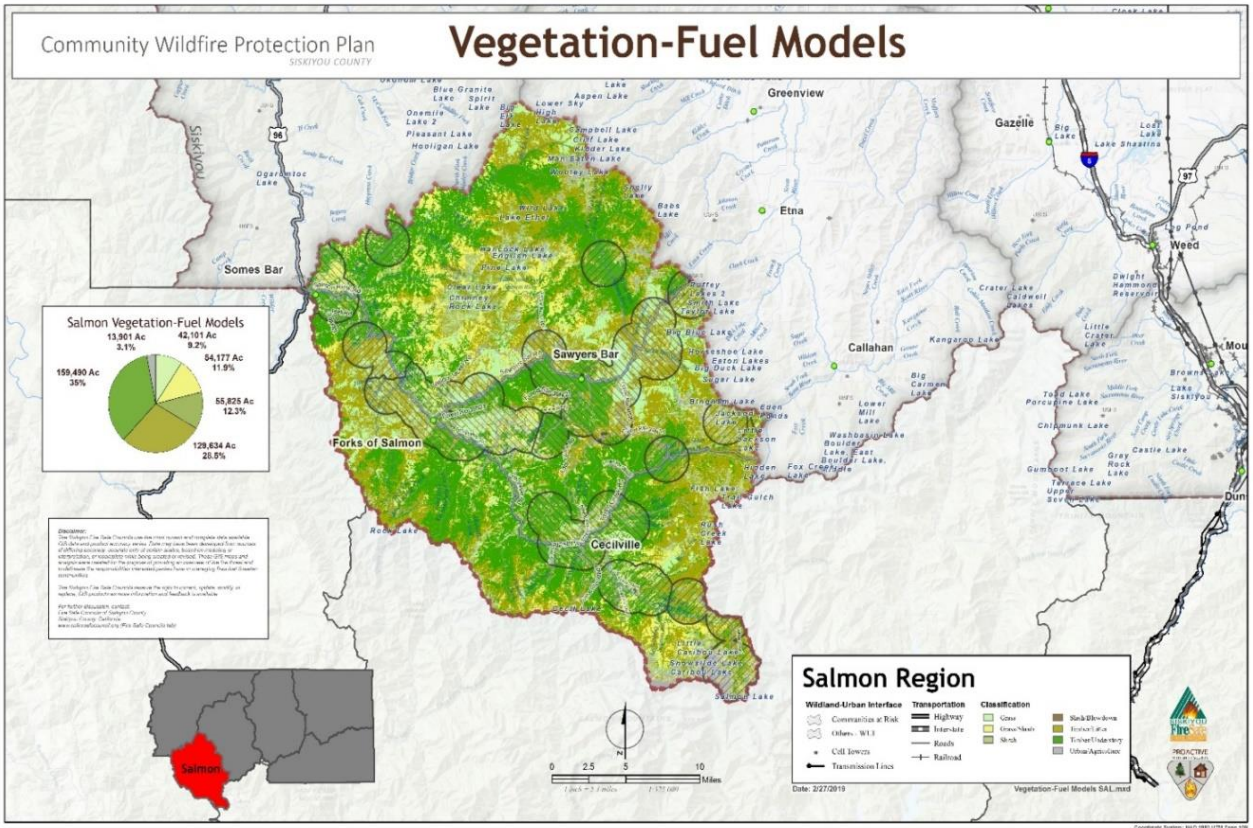
- Steep slopes associated with the Klamath River system.
- Fuel accumulation along with the steep slopes.
- Very difficult access for suppression resources

Fuels

IMPORTANT NOTE

Timber understory (Douglas-fir types) is the dominant fuel type. With wildfire becoming a more frequent visitor on the landscape, grass, grass/shrub and shrub are becoming more prevalent across the PR.

Figure 2 - Vegetation as translated into major fuel or vegetation types of burnable vegetation.



Acres/% Acres of Primary Fuel Types – Salmon PR		
	Acres	% Acres
Grass	42,101	11%
Grass/Shrub	54,177	11%
Shrub	55,825	14%
Timber Litter	129,634	22%
Timber Understory	159,490	40%
Slash/Blowdown	41	0%
Non-burnable	13,901	2%
Total	**455,169**	**100%**

Weather

Weather is marked by very hot summer days, being shielded in the Salmon River drainage behind the mountains from the cooling Pacific influence affecting nearby coastal locations. The winters are much cooler and rainier than in inland locations further south, albeit still very mild compared to areas to the east of the continent. The dry and hot summers make the surrounding forest prone to wildfires which recent history demonstrates that they can burn for months. The high winter rainfall however, keeps the area greener than its summer climate would suggest. Average lows remain cool year-round, relieving the intense daytime heat and keeping the average July temperature at around 73 °F (23 °C) in sharp contrast to the 95 °F (35 °C) average highs (Wikipedia, 2019).

Three significant types of fire weather conditions that occur during fire season, important in the southern Klamath range: (1) Pacific High (Postfrontal) (2) Pacific High (Prefrontal), and (3) Subtropical High Aloft (Subtropical High). (Fire in CA Ecosystems, 2018)

- *Postfrontal* conditions occur when high pressure follows the passage of a cold front and causes strong foehn winds from the north and northeast. are frequent in springtime and again in late summer and fall.
- *Prefrontal* pattern includes episodes of thunderstorms most common July to August but can occur from June through mid-September. The resulting cells have high bases, much of the precipitation associated with them evaporates before reaching the ground. 'Dry lightning' events often result in many fire ignitions over a relatively short time, a situation that can be rapidly compounded by the associated gusty erratic downdraft winds.
- *Subtropical High* conditions occur when the region is under the influence of high pressure that causes temperatures to rise and humidity to drop. In this bioregion, these conditions lead to fires controlled mostly by local topography. Subtropical High conditions promote the development of strong temperature inversions that inhibit smoke from venting out of the canyons and valley bottoms leaving only the ridgetops in full sun. Fires burning above the inversion layer and immediately after dissipation of the inversion, especially when accompanied by strong winds, can produce large areas of high severity (Weatherspoon and Skinner 1995).

Lightning is common in the Klamath Mountains. Lightning-caused fires have accounted for most area burned in recent decades (for example, 1977, 1987, 1999, 2002, 2006, 2008, 2012, and 2014). Large number of simultaneous ignitions combined with poor access for fire-suppression forces, steep topography, and extensive strong canyon inversions (see above) generate widespread lightning fires that often burn for weeks to months over large areas (e.g., Estes et al. 2017). Storms producing lightning-caused fires are associated with higher instability and drier air than storms that produce the most lightning strikes. In each of 1987, 1999, 2008, and 2012 a single storm episode was responsible for nearly all of the area burned by lightning-caused fires. The contribution of lightning-caused fires to total area burned has increased from 42% to 87% over the last century while the annual area and sizes of fires have significantly increased (Miller et al. 2012a).

Topography

- The topography of the Salmon Region is defined by its major rivers and streams. The corresponding slopes that run into the waterways are steep and quite rugged. The steep slopes provide for a constant affect on fire behavior as the slopes significantly influence fire spread (fires spread more rapidly on steep slopes).

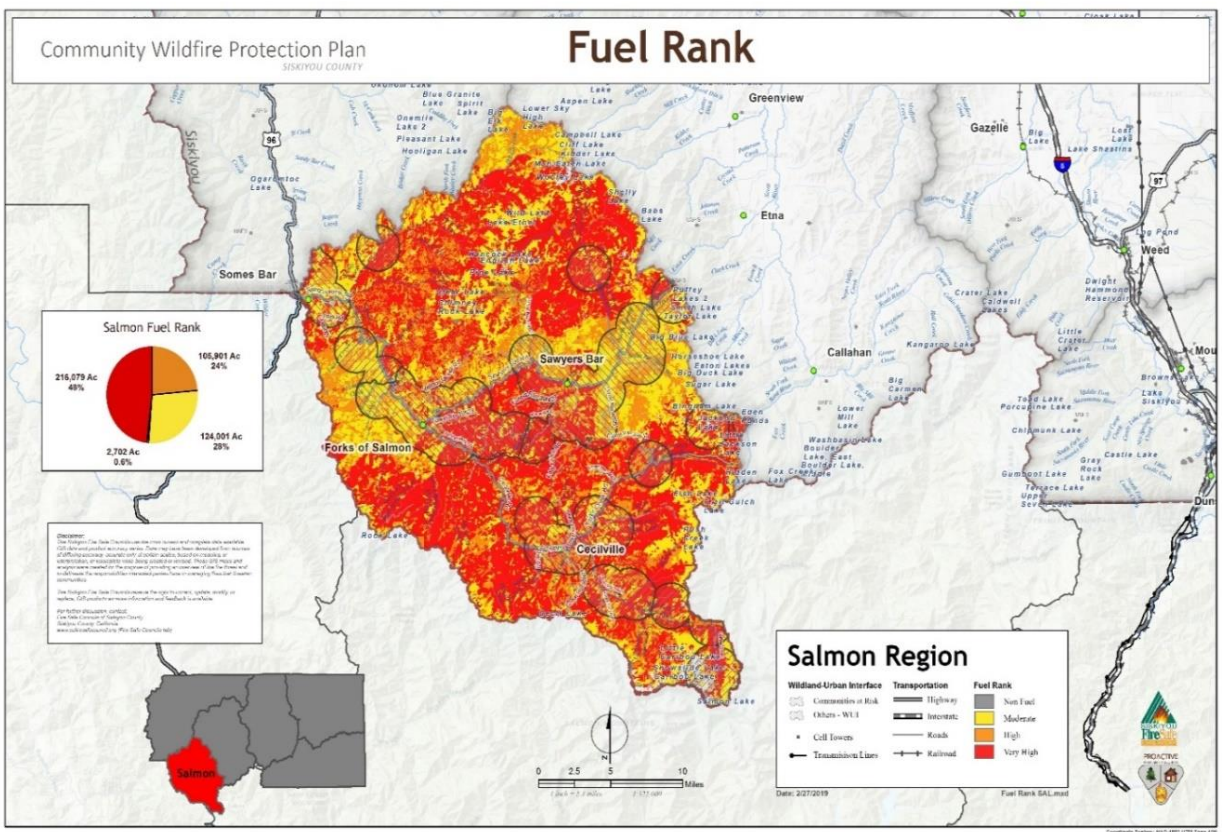
- Elevation ranges from about 440 feet at the confluence of the Salmon and Klamath Rivers near Somes Bar to the top of Caesar Peak at 8,920 feet in the southeast corner of the PR in the Trinity Wilderness.
- The Salmon River runs east-west from Forks of Salmon down to Somes Bar. At Forks, the river branches into two main stems: North Fork and South Fork.
- The steep incised canyons set up dominant inversions during major fire events. The deeply incised canyons block the general winds, hence reducing the likelihood of the winds scouring the same away.

Expected Fire Behavior

Lightning is the primary progenitor of fires. It is difficult to provide initial action on all of the fire starts when a major lighting event occurs. Fires can become well established and a robust history of large fires has occurred. See trailing Fire History map. Fire can run rapidly during the incipient stages but once established, the large fuels coupled with the steep topography provide intense fire intensities making suppression actions difficult. As fires get larger, intense smoke inversions develop adding to the difficulty of suppressing wildfires. Fire spread slows down under inversions but the heavy fuels on steep slopes make fuel break construction difficult.

Figure 3 - Fuel Rank for Salmon PR

Note: Fuel Rank is based on expected fuels under fire behavior for unique combinations of topography and vegetative a given severe weather condition (wind speed, humidity, and temperature). This tool is used by CAL FIRE to prioritize pre-fire projects that reduce the potential for large, catastrophic wildfires. Fuel Rank does not factor in the likelihood of a fire event or fire frequency.



Fuel Rank Acres - Salmon PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Total Result	2,702	124,001	105,901	216,079	448,683

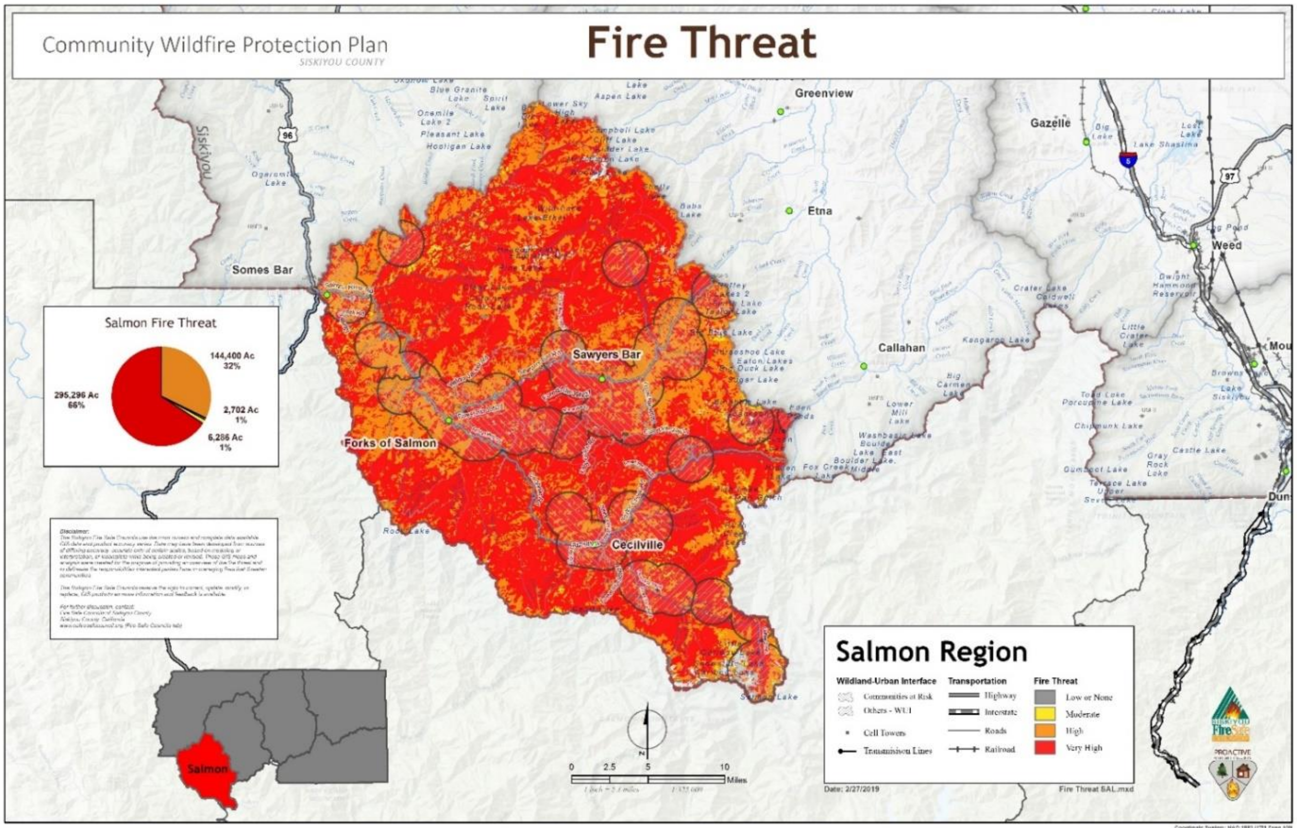
Percent Fuel Rank Acres - Salmon PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Total Result	1%	28%	24%	47%	100%

Communities at Risk: Fuel Rank Acres - Salmon PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total Result
Cecilville	15	3,503	4,854	10,152	**18,524**
Forks of	363	9,246	5,537	13,132	**28,277**
Sawyers Bar	1	13,558	12,919	10,501	**36,979**
Somes Bar	1,584	31,182	7,260	6,650	**46,676**
Other WUI	571	12,908	11,312	23,939	**48,729**
Total All WUI	**2,534**	**70,396**	**41,881**	**64,373**	**179,185**

Communities at Risk: Percent Fuel Rank Acres - Salmon PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	
Cecilville	0%	19%	26%	55%	**100%**
Forks of Salmon	1%	33%	20%	46%	**100%**
Sawyers Bar	0%	37%	35%	28%	**100%**
Somes Bar	3%	67%	16%	14%	**100%**
Other WUI Total	1%	26%	23%	50%	**100%**
Total All WUI	**1%**	**40%**	**23%**	**36%**	**100%**

Figure 4 - Wildland Fire Threat for Salmon PR

Note: Fire Threat is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes.



Fire Threat Acres - Salmon PR					
	Low or None	Moderate	High	Very High	Total Result
Salmon	2,702	6,286	144,400	295,296	448,684

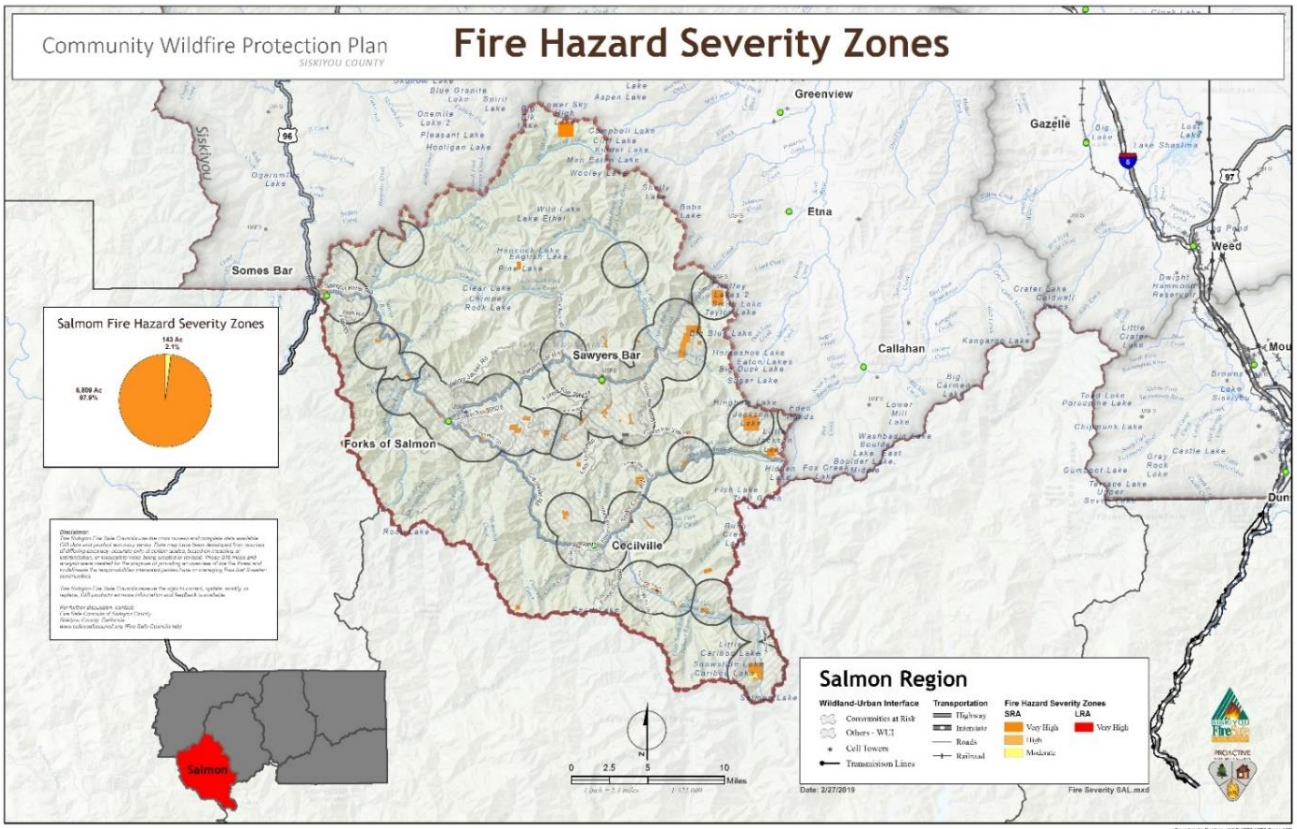
Percent Fire Threat Acres - Salmon PR					
	Low or None	Moderate	High	Very High	Total Result
Salmon	1%	1%	32%	66%	100%

Communities at Risk: Fire Threat Acres - Salmon PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Cecilville	15	50	4,901	13,557	**18,524**
Forks of Salmon	363	63	11,432	16,419	**28,277**
Sawyers Bar	1	46	15,724	21,208	**36,979**
Somes Bar	1,584	28,012	14,524	2,556	**46,676**
Total Non-WUI	571	1,160	15,234	31,765	**48,729**
Total All WUI	**2,534**	**29,332**	**61,815**	**85,504**	**179,185**

Communities at Risk: Percent Fire Threat Acres - Salmon PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Cecilville	0%	0%	26%	73%	**100%**
Forks of Salmon	1%	0%	40%	58%	**100%**
Sawyers Bar	0%	0%	43%	57%	**100%**
Somes Bar	3%	60%	31%	5%	**100%**
Total Non-WUI	1%	2%	31%	65%	100%
Total All WUI	1%	16%	34%	48%	100%

Wildland Fire Severity

Figure 5 – Fire Severity for Salmon PR
Note: Fire Severity is a California State legislatively required fire behavior variable.



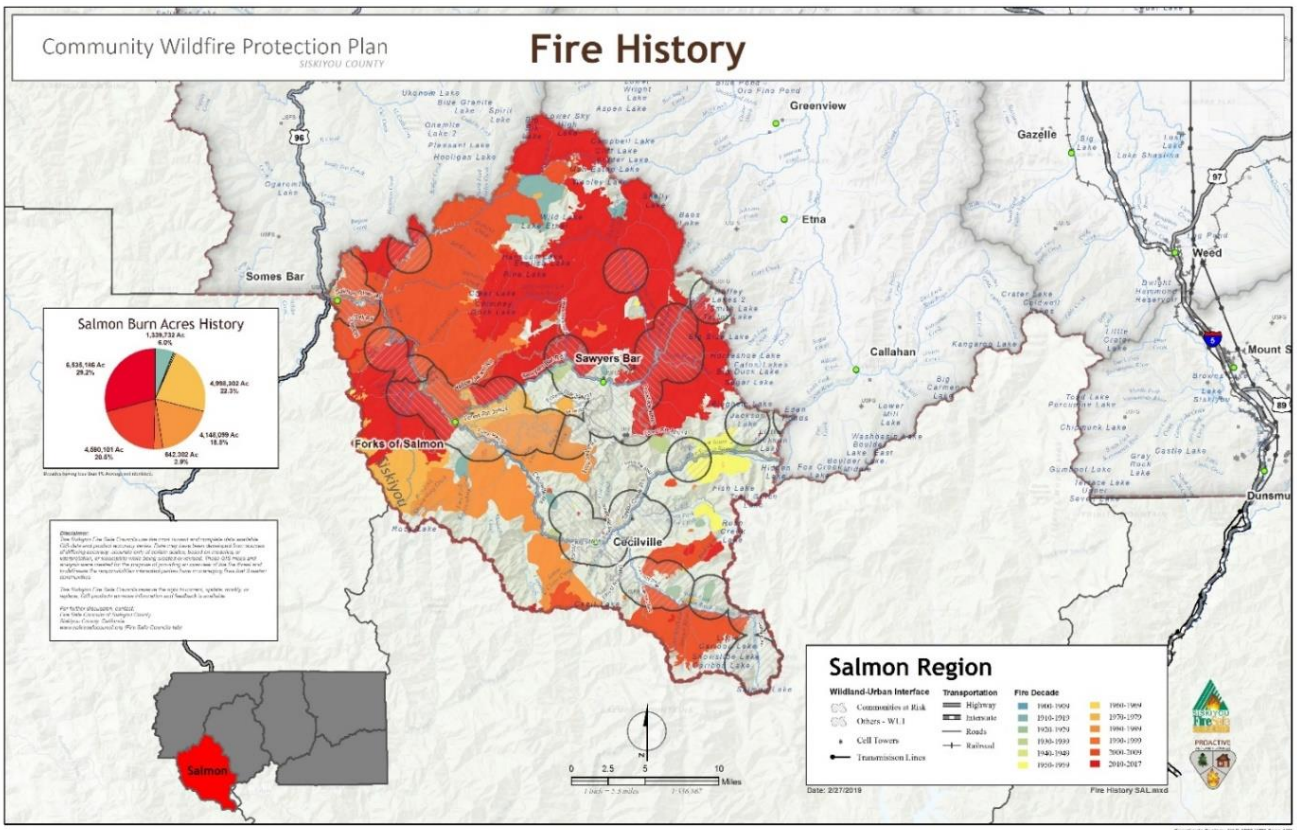
The trailing two tables display the fire severity classifications as required by State law and determined by CAL FIRE. The State of California is responsible for wildland suppression activities on privately owned parcels within State Responsibility Areas and local jurisdictions are responsible within the Local Responsibility Area. There are no acres of private land that are protected by a local Fire Department.

Severity Acres - Salmon PR				
Responsibility	Moderate	High	Very High-SRA Very High-LRA	Total
State	143		6,809	6,953

Severity Acres by % Acres - Salmon PR				
Responsibility	Moderate	High	Very High-SRA Very High-LRA	Total
Local	2%		98%	100%

Fire History

Figure 6 - Fire History Identified by decade (1900-2017) for Salmon PR



Community Preparedness Aspects

Water sources in the Salmon area are critical in wildfire suppression actions. There are well known (and mapped) year-round lakes and perennial water courses.

- It is important that fire suppression personnel and community members are fully aware of water sources; communicate with their local FSC's and fire departments about the locations; map them and be sure they are noted and kept current in their local level CWPPs.

- Communities not covered in local CWPP should be working directly with their area wildfire agency personnel to ensure all water sources are located and identified on a 'unit map' and updated regularly.

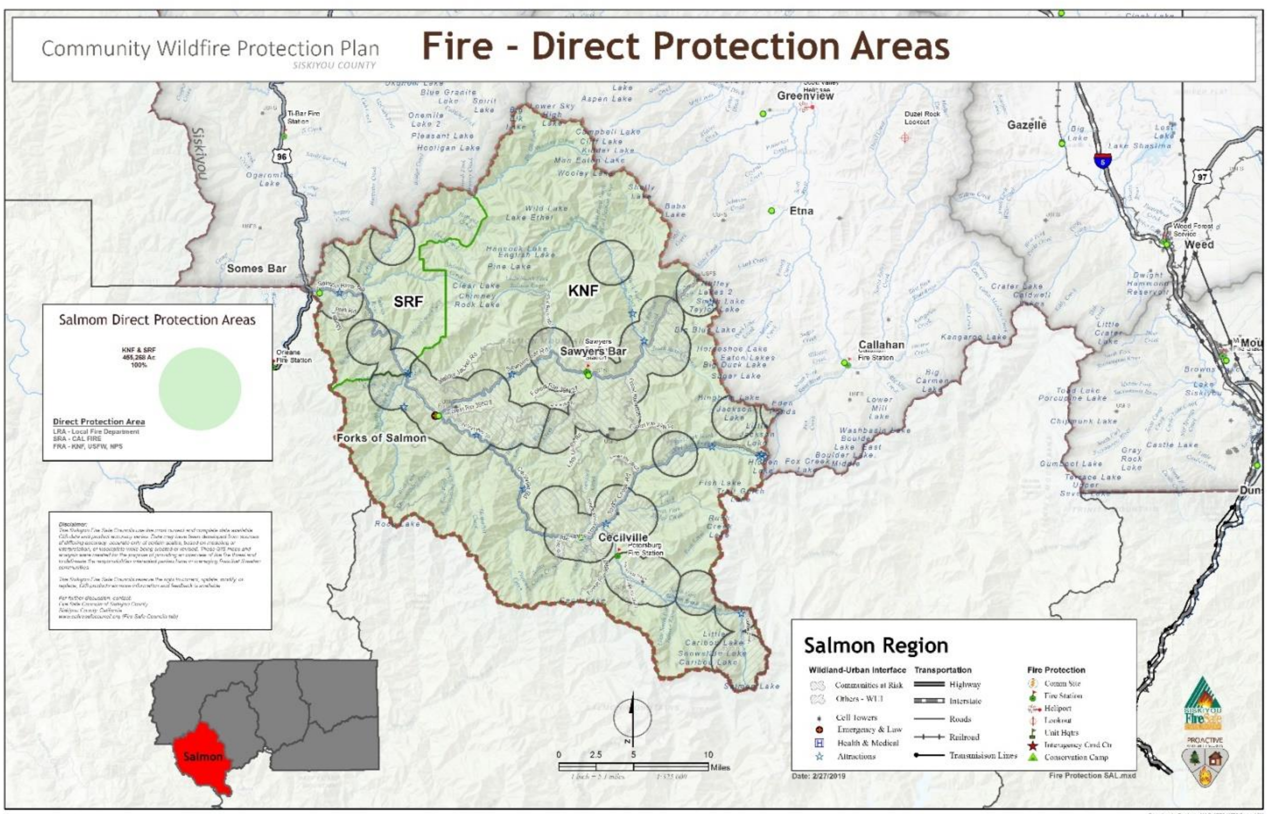
Descriptions and lists of activities and efforts by community citizens and groups to improve fire safety in their areas should be compiled by the local Fire Safe Councils.

- Active Fire Safe Councils (FSCs)
  - Orleans/Somes Bar FSC
  - Salmon River FSC
- See Pre-Fire Projects – as listed in CAL FIRE Siskiyou Unit (see *Appendix E*)

Wildfire Protection

The wildland fire suppression in the Salmon Region is almost entirely the responsibility of Federal resources, except for a small portion in the extreme northeast area of the Region. Though there are private lands that by law the CAL FIRE must protect, the CFMA includes these private lands in the trade-off for efficiency purposes.

Figure 7 - Fire Direct Protection Areas for Salmon PR



- Wildland fire protection agencies/protection entities:
  - USFS Klamath NF: Salmon River Battalion: suppression resources include a Division Chief, 2 Battalion Chiefs (Suppression and Fuels), 2 engines (type 3), a Fire Prevention Officer, a Fuels technician, a 20-person T1 fire crews, and multiple seasonal suppression resource employees.
  - Community / volunteer fire departments: engines housed at each of the stations (Orleans/Somes and the Salmon River Hose Company.
  - **NOTE:** Equipment & typical staffing/personal numbers will vary based on needs and funding *(refer to local CWPPs or call area representative wildfire protection agency for current/updated staffing information).*

- Primary concerns and challenges faced by protection forces:

#1 = Access-egress routes are amongst the highest priority safety elements in a wildfire emergency.

- Evacuation Route Mitigation Actions are a necessity for life safety of citizens and emergency personnel

  Evacuation route assessment should include, but is not limited to:

  - ✓ Roadbed width and adequate pullouts
  - ✓ Roadside vegetation clearance
  - ✓ Roadside power-pole and power line clearance
  - ✓ Signing of existing residence(s) on side roads
  - ✓ Clear marking of fire hydrant/water sources

IMPORTANT NOTE: Salmon PR leadership, citizens and interagency cooperators should expand on a list of challenges and mitigation actions in FSC level and/or local community level meetings. Larger scale maps can be reproduced to help identify primary evacuation routes for community awareness, education, and to incorporate priority fuels treatments into local CWPP Action plans.

Contact information for local fire protection services:

State Resources

- **CAL FIRE Station**:

  None proximate to the Salmon PR

Federal Resources

- **USFS Sawyers Bar Work Center:**

  462 Cemetery Ally, Sawyers Bar, CA 96027 | (530) 462-4683
  http://www.fs.usda.gov/klamath
- **USFS Petersburg Work Center:**

  Cecilville, CA 96031| (530) 465-1505
  http://www.fs.usda.gov/klamath

Local Community & Volunteer Resources

- **Salmon River Hose Company:**
  15600 Salmon River Rd, Forks Of Salmon, CA 96031 | (530) 493-2643
  http://www.happycampambulance.com/

- **Orleans Volunteer Fire Department:**
  38162 Highway 96, (PO Box 312), Orleans, California 95556 | (530) 627-3344
  https://www.orleansvfd.org/

Evacuation

IMPORTANT EVACUATION INFORMATION:
Refer to Section 6.4 Evacuation for helpful pre-emergency tools, websites, and general procedures regarding area evacuations.

A map of primary roads identified for evacuation routes is an essential tool that should be developed at the local community level. The cartographic/GIS information for this road map information is provided on the FSCSC web site. Larger scale maps can be reproduced for use by community leadership and/or local FSCs. Local FSCs should make it a priority to identify main evacuation routes and prepare a local plan to reduce hazardous fuels along these routes so residents can evacuate safely and first responders/fire-fighting resources can safely access an area.

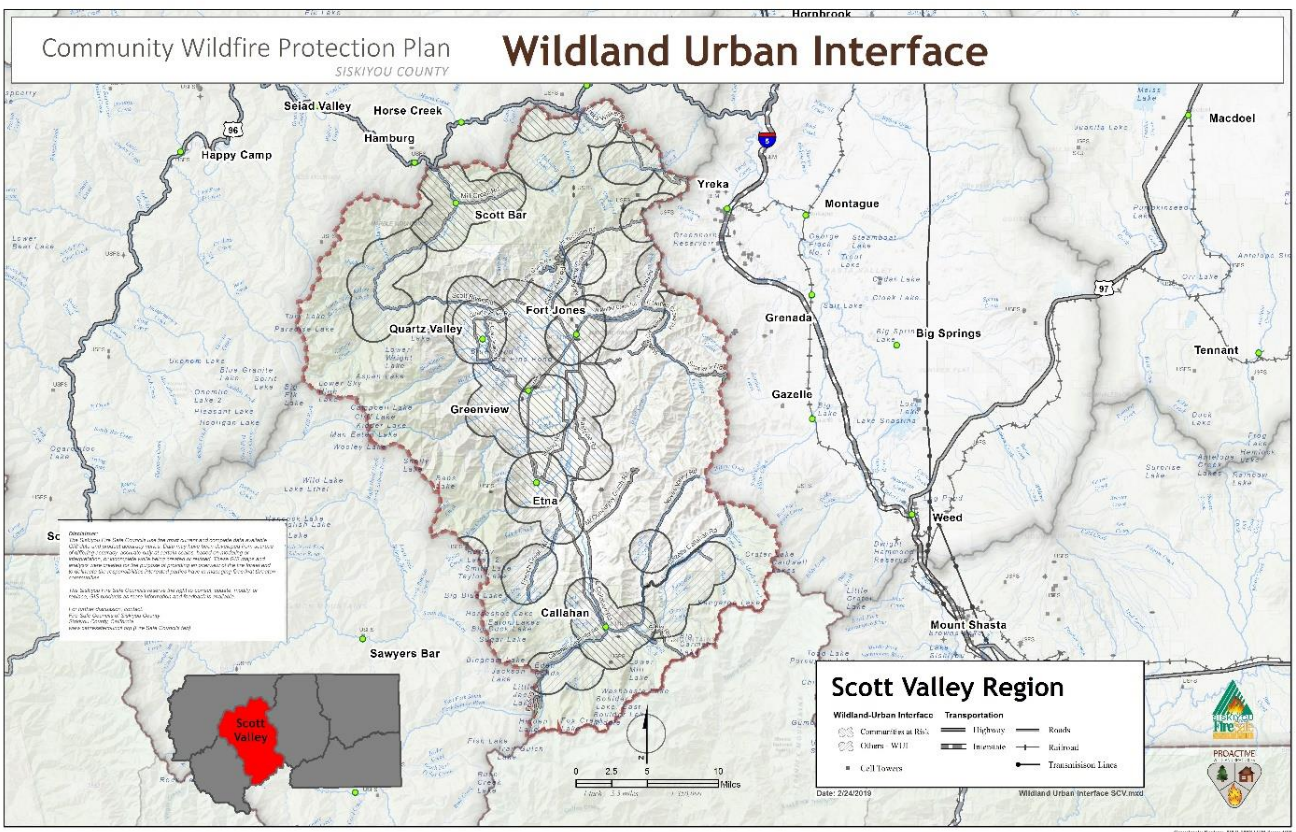
4. Scott Valley Planning Region

General Overview/Description

- The Scott Valley PR is a conglomeration of significant agricultural lands and forested lands that were heavily cut in the late 1800's. Much of the mixed conifer associations managed today are second or third growth forests.
- Dissected by Highway 3, a north-south route, and the Scott River.
- Logging and mining began in the 1800s and continues to the present time.
- The central portion of the PR is primarily grasslands and agriculture.
- There are seven identified Communities at Risk (CAR – see Section 4): Callahan, Etna, Fort Jones, Greenview, Lower Scott River, Quartz Valley Indian Reservation, Scott Bar.
- The largest communities in the region are Fort Jones, Etna, and Greenview, but the majority of residents live outside of these communities.
- Additional WUI communities include Mugginsville, Cheeseville, and Hooperville.
- Approximate population in the PR is 5,259 (2010 Census, http://factfinder.census.gov).

Figure 1 - General Overview of the Scott Valley PR

Note: Federal and State of California listed Communities at Risk are annotated by name. WUIs not associated with a CAR are denoted with a crosshatch from upper right to lower left.



Values and Assets at Risk

- The Scott River.
- Highway 3, which is a significant road connecting Yreka to Weaverville in Shasta County.
- CAL FIRE's Deadwood Conservation Camp, which houses and trains inmate crews for fighting fires and conducting other work for public benefit.
- Scott Valley airport.
- Cal-Forest Nurseries, which provide seedlings to timberland owners throughout northern California.
- Additional assets of significant value that could be threatened with destruction during a wildfire were identified by community members in public workshops and included: structures, residences, electrical power grid lines, parks, lakes, recreation sites, unique habitat for rare, threatened or endangered species, forest resources and cultural/historical sites.

Wildfire Environment

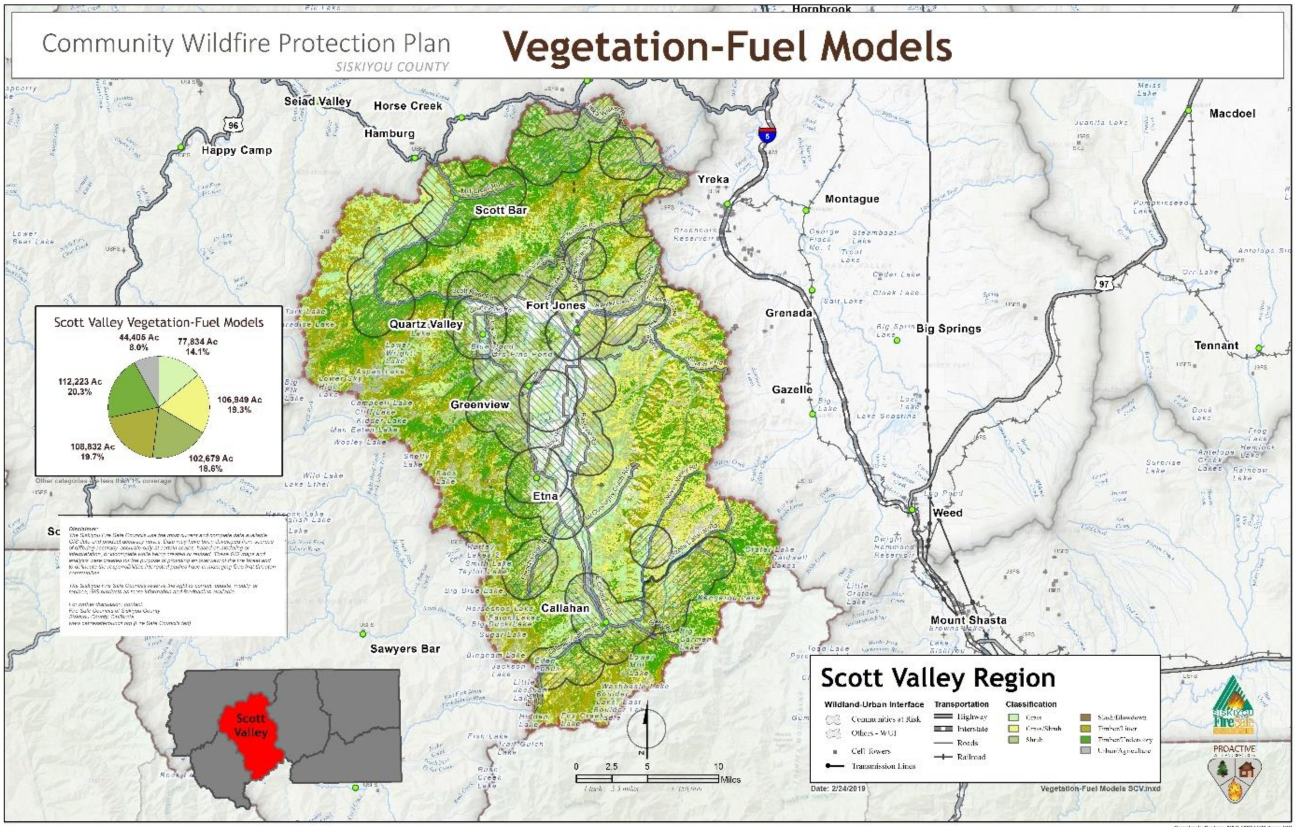
Effective fire suppression has excluded wildfire from most of the plant associations found within the Scott Valley PR (USDA 1996). High stocking levels (many more plants than would be found in a natural fire regime) now dominate portions of the area and, when conditions are right, can create dramatic fire effects. Fortunately for the region, the last large fires were in the 1950s (Kidder fire – 12 thousand acres and Haystack fire – 59 thousand acres) with recent fires being much smaller in size. However, the threat to the region remains high to very high that a significant and severe wildfire will be ignited within the region.

Fuels

IMPORTANT NOTE

Grass and shrub vegetation, with lighter and faster burning fuels, comprise approximately 20% of the Scott Valley area. Ignitions can quickly become fast moving infernos.

Figure 2 - Vegetation as translated into major fuel or vegetation types of burnable vegetation



Acres/% Acres of Primary Fuel Types – Scott Valley PR		
	Acres	% Acres
Grass	77,834	14%
Grass/Shrub	106,949	19%
Shrub	102,679	19%
Timber Litter	108,832	20%
Timber Understory	112,223	20%
Slash/Blowdown	-	0%
Non-burnable	44,405	8%
Total	**552,923**	**100%**

Weather

There are three primary fire weather patterns that can significantly affect fire behavior and natural ignitions in this northeastern area during the May-to-October fire season: (1) Pre-frontal Winds, (2) Lightning with Low Precipitation, and (3) Strong Subsidence/Low Relative Humidity patterns (Fire in California Ecosystems, Ch.13, p.220).

- *Prefrontal wind events* are frequent in springtime and again in late summer and fall. They are of most consequence in the latter period, when both live and dead fuel moistures are low. This pattern usually occurs between 5 and 10 times a year, with one or two significant events during the fall season of most years. These conditions can lead to rapid fire spread and extreme fire behavior.

- *Lightning and low precipitation* pattern includes episodes of thunderstorms most common from July to August but can occur from June through mid-September. The resulting cells have high bases, much of the precipitation associated with them evaporates before reaching the ground. "Dry lightning" events often result in many fire ignitions over a relatively short time, a situation that can be rapidly compounded by the associated gusty erratic downdraft winds.
- *Strong Subsidence/Low Relative Humidity* with enough duration causes a significant increase in northeastern California fire potentials, even without much wind. The pattern occurs when a strong mid- and/or upper level high-pressure area is centered to the west of northeastern California for a period of at least several days. Daytime minimum RH usually drops to 4–12%, but nighttime recovery is very low, reaching only the 15–30% range. Dead fuel moistures drop, live fuels become more stressed, and fires ignite, spread, and spot more easily.

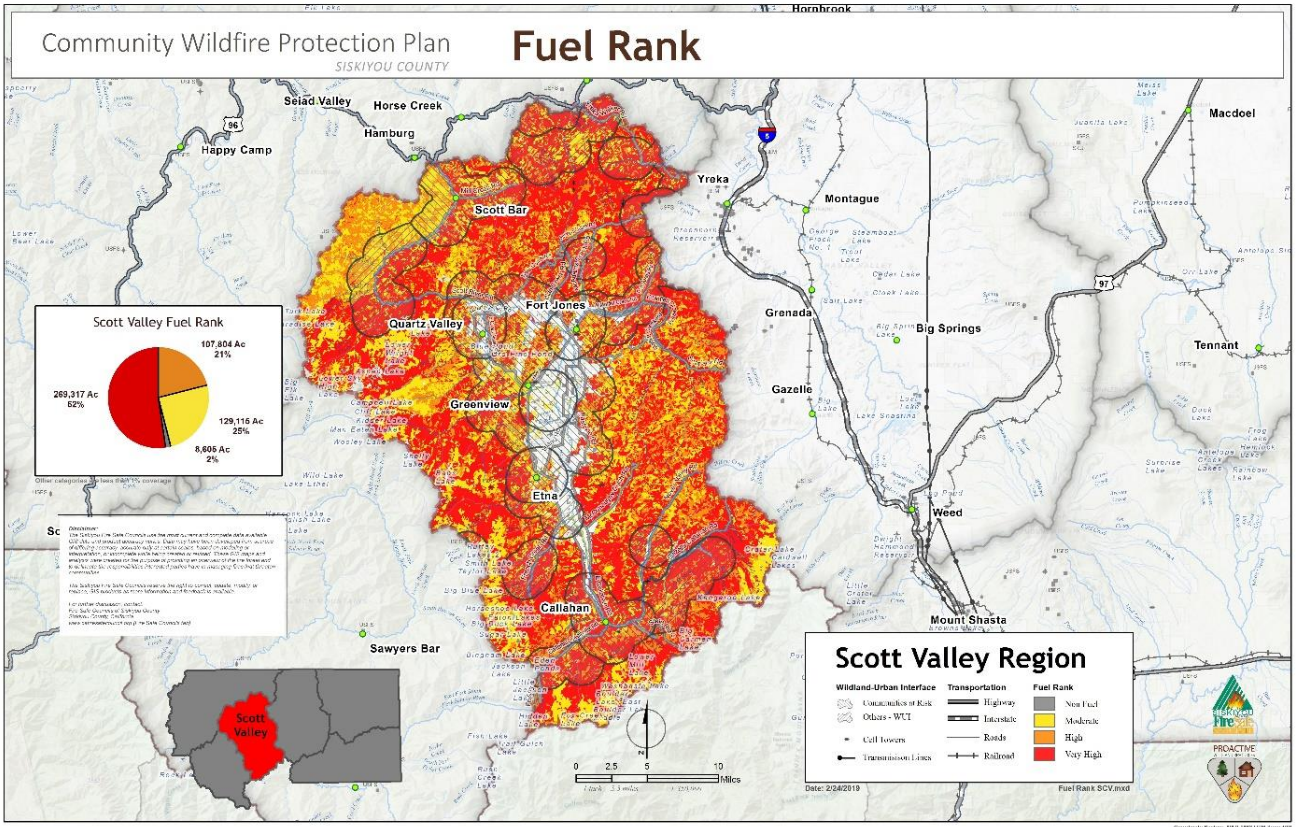
Topography

- Topographically, the area is noted for its vast forested mountains derived both from volcanic and tectonic activities bordering the valleys with grass/light shrub habitats.
- Elevations range from about 1,560 feet along the Klamath River to 8,551 at the top of China Mountain.

Expected Fire Behavior

Figure 3 - Fuel Rank for Scott Valley PR

Note: Fuel Rank is based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, and temperature). This tool is used by CAL FIRE to prioritize pre-fire projects that reduce the potential for large, catastrophic wildfires. Fuel Rank does not factor in the likelihood of a fire event or fire frequency.



Fuel Rank Acres - Scott Valley PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Scott Valley	8,605	129,115	107,804	269,317	514,841

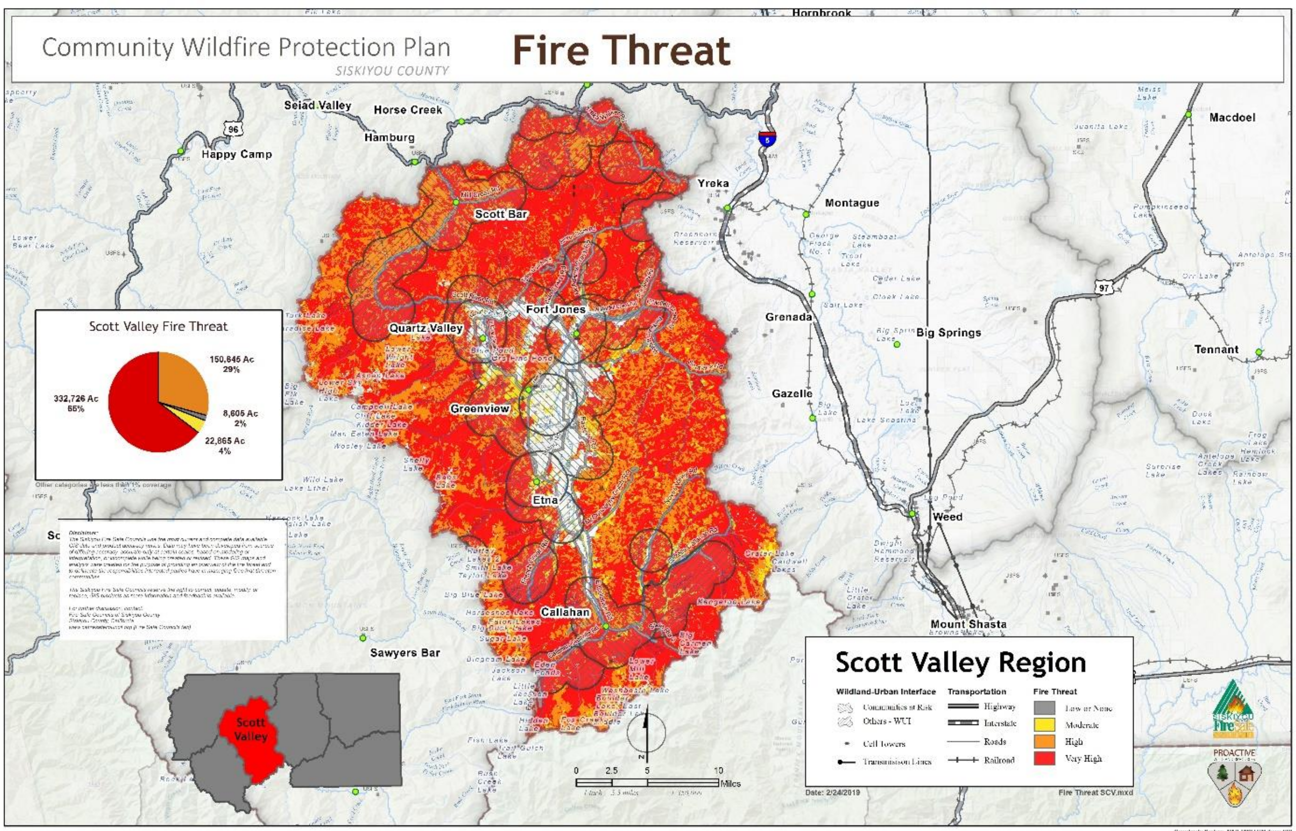
Percent Fuel Rank Acres - Scott Valley PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Scott Valley	2%	25%	21%	52%	100%

Communities at Risk: Fuel Rank Acres - Scott Valley PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total
Callahan	282	2,260	2,548	10,826	**15,917**
Etna	233	1,731	1,309	2,719	**5,991**
Fort Jones	1,974	29,901	7,098	6,698	**45,671**
Greenview	811	1,345	143	580	**2,879**
Horse Creek		610	754	2,823	**4,187**
Lower Scott River	181	5,161	4,682	8,328	**18,353**
Quartz Valley Indian Reservation	278	2,170	1,902	2,589	**6,938**
Scott Bar	114	6,856	4,488	7,324	**18,781**
Other WUI Total	3,206	24,933	24,178	68,940	**121,256**
Total All WUI	**7,078**	**74,966**	**47,102**	**110,827**	**239,973**

Communities at Risk: Percent Fuel Rank Acres - Scott Valley PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total
Callahan	2%	14%	16%	68%	**100%**
Etna	4%	29%	22%	45%	**100%**
Fort Jones	4%	65%	16%	15%	**100%**
Greenview	28%	47%	5%	20%	**100%**
Horse Creek	0%	15%	18%	67%	**100%**
Lower Scott River	1%	28%	26%	45%	**100%**
Quartz Valley Indian Reservation	4%	31%	27%	37%	**100%**
Scott Bar	1%	37%	24%	39%	**100%**
Other WUI Total	3%	21%	20%	57%	**100%**
Total All WUI	**3%**	**31%**	**20%**	**46%**	**100%**

Figure 4 - Wildland Fire Threat for Scott Valley PR

Note: Fire Threat is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes.



Fire Threat Acres - Scott Valley PR					
	Low or None	Moderate	High	Very High	Total Result
Scott Valley	8,605	22,865	150,645	332,726	514,841

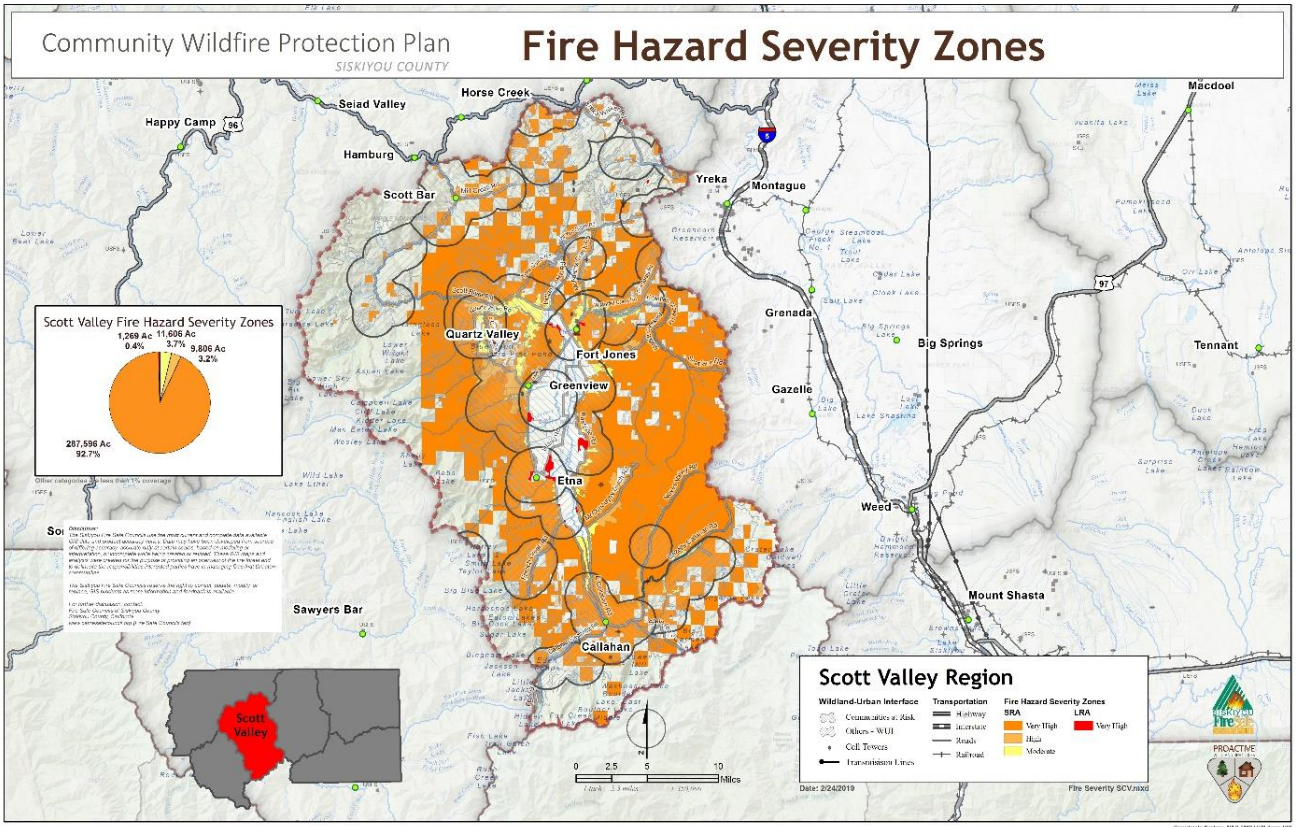
Percent Fire Threat Acres - Scott Valley PR					
	Low or None	Moderate	High	Very High	Total Result
Scott Valley	2%	4%	29%	65%	100%

Communities at Risk: Fire Threat Acres - Scott Valley PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Callahan	282	529	3,709	11,396	**15,917**
Etna	233	817	1,238	3,704	**5,991**
Fort Jones	1,974	28,211	12,419	3,067	**45,671**
Greenview	811	1,251	363	453	**2,879**
Horse Creek		100	942	3,144	**4,187**
Lower Scott River	181	70	6,594	11,508	**18,353**
Quartz Valley Indian Reservation	278	518	1,951	4,192	**6,938**
Scott Bar	114	166	7,591	10,911	**18,781**
Other WUI	3,206	6,958	27,915	83,178	**121,256**
Total All WUI	**7,078**	**38,620**	**62,722**	**131,553**	**239,973**

Communities at Risk: Percent Fire Threat Acres - Scott Valley PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Callahan	2%	3%	23%	72%	**100%**
Etna	4%	14%	21%	62%	**100%**
Fort Jones	4%	62%	27%	7%	**100%**
Greenview	28%	43%	13%	16%	**100%**
Horse Creek	0%	2%	23%	75%	**100%**
Lower Scott River	1%	0%	36%	63%	**100%**
Quartz Valley Indian Reservation	4%	7%	28%	60%	**100%**
Scott Bar	1%	1%	40%	58%	**100%**
Other WUI	3%	6%	23%	69%	**100%**
Total All WUI	**3%**	**16%**	**26%**	**55%**	**100%**

Wildland Fire Severity

Figure 5 - Fire Severity is a legislatively required fire behavior variable

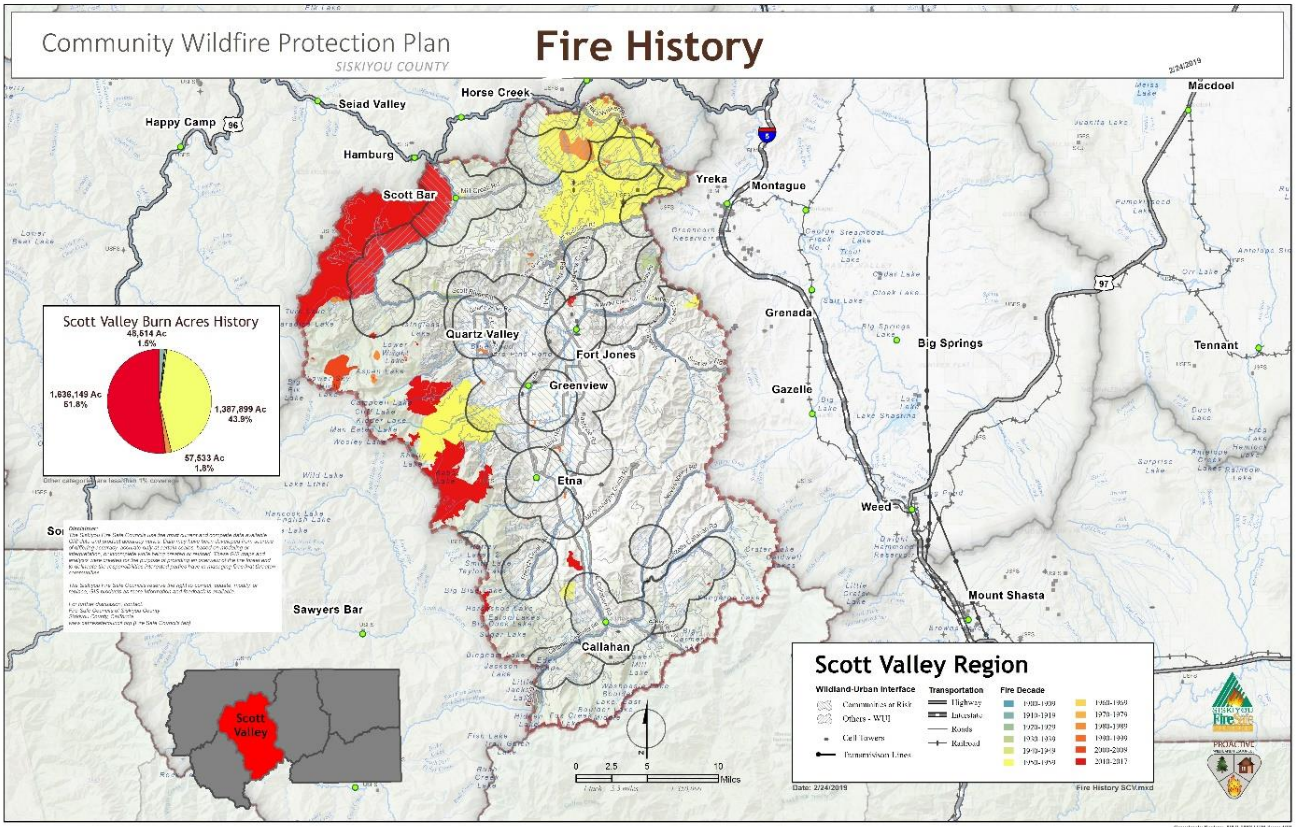


Fire Hazard Severity Acres - Scott Valley PR				
Responsibility	Moderate	High	Very High-SRA Very High-LRA	Total
State	11,606	9,806	287,596	309,008
Local			1,269	1,269

Severity Acres by % Acres - Scott Valley PR				
Responsibility	Moderate	High	Very High-SRA Very High-LRA	Total
State	4%	3%	93%	100%
Local			100%	100%

Fire History

Figure 6 - Fire History identified by decade (1900-2017); Scott Valley PR



Community Preparedness Aspects

Water sources in Scott Valley are critical in wildfire suppression actions. There are a number of scattered, well known (and mapped) year-round lakes; but there are also areas with little or no water when the intermittent stream corridors dry out, mid-late summer and into fall.

- It is important that fire suppression personnel and community members are fully aware of water sources; communicate with their local FSC's and fire departments about the locations; map them and be sure they are noted and kept current in their local level CWPPs.
- Communities not covered in local CWPP should be working directly with their area wildfire agency personnel to ensure all water sources are located and identified on a 'unit map' and updated regularly.

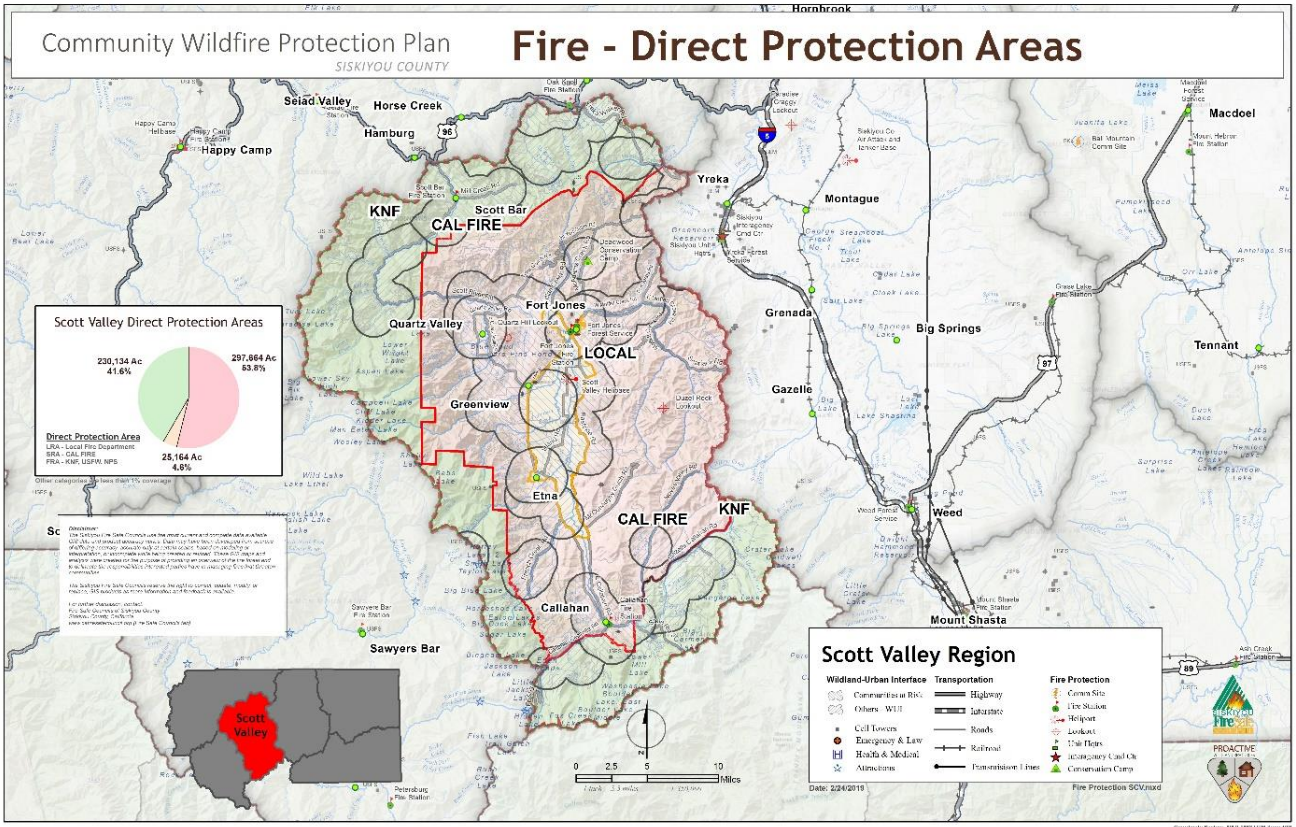
Descriptions and lists of activities and efforts by community citizens and groups to improve fire safety in their areas should be compiled by the local Fire Safe Councils.

- Active Fire Safe Councils (FSCs)
  - French Creek FSC
  - Lower Scott River FSC
  - Quartz Valley FSC
  - Rattlesnake Creek FSC
  - Scott Bar FSC
  - Scott Valley FSC

- For ongoing fuels reduction projects contact your local community FSC representative
- See Pre-Fire Projects – as listed in CAL FIRE Siskiyou Unit (see *Appendix E*)

Wildfire Protection

Figure 7 - Fire Direct Protection Areas; Scott Valley PR



- Fire protection agencies/protection entities:
  - CAL FIRE resources consist of a Battalion Chief, 2 engines in Fort Jones, and 4 crews at the Deadwood Conservation Camp.
  - ▪ USFS Klamath NF: Scott River Battalion: suppression resources include a Division Chief, 2 Battalion Chiefs (Suppression and Fuels), 2 engines (type 3), a Fire Prevention Officer, a Fuels technician, Two 10-person fire crews, T2 helicopter Scott Valley Helibase and multiple seasonal suppression resource employees
  - Community / volunteer fire departments: engines housed at each of the stations [Etna FD, Fort Jones Volunteer FD, and Scott Valley FPD (12 pieces of equipment in seven stations)]

    NOTE: Equipment & typical staffing/personal numbers will vary based on needs and funding *(refer to local CWPPs or call area representative wildfire protection agency for current/updated staffing info)*

- Primary concerns and challenges faced by protection forces:

#1 = Access-egress routes are amongst the highest priority safety elements in a wildfire emergency.

- Evacuation Route Mitigation Actions are a necessity for life safety of citizens and emergency personnel

  Evacuation route assessment should include, but is not limited to:

  - ✓ Roadbed width and adequate pullouts
  - ✓ Roadside vegetation clearance
  - ✓ Roadside power-pole and power line clearance
  - ✓ Signing of existing residence(s) on side roads
  - ✓ Clear marking of fire hydrant/water sources

IMPORTANT NOTE: Scott Valley PR leadership, citizens and interagency cooperators should expand on a list of challenges and mitigation actions in FSC level and/or local community level meetings. Larger scale maps can be reproduced to help identify primary evacuation routes for community awareness, education, and to incorporate priority fuels treatments into local CWPP Action plans.

Contact information for local fire protection services:

- **CAL FIRE Station Fort Jones (seasonal)**:
  12137 Main Street, Fort Jones, CA 96032 | (530) 468-2696
  http://www.calfire.ca.gov/contacts/station?SID=746
- **Deadwood Conservation Camp**:
  17140 McAdams Creek Rd, Fort Jones, CA 96032 | (530) 468-2235
  http://www.calfire.ca.gov/contacts/station?SID=745
- **Etna Fire Department:**
  400 Main St, Etna, CA 96027 | (530) 467-3295
- **Fort Jones Volunteer Fire Department:**
  31 Main St, Fort Jones, CA 96032 | (530) 468-2261
- **Scott Valley Fire Protection District:**
  317 Maple St, Greenview, CA 96037 | (530) 468-2170
  Stations in Callahan, French Creek, Greenview, Moffett Creek, Scott River Rd., Eastside Rd., and Masterson Rd.

Evacuation

IMPORTANT EVACUATION INFORMATION:

Refer to Section 6.4 Evacuation for helpful pre-emergency tools, websites, and general procedures regarding area evacuations.

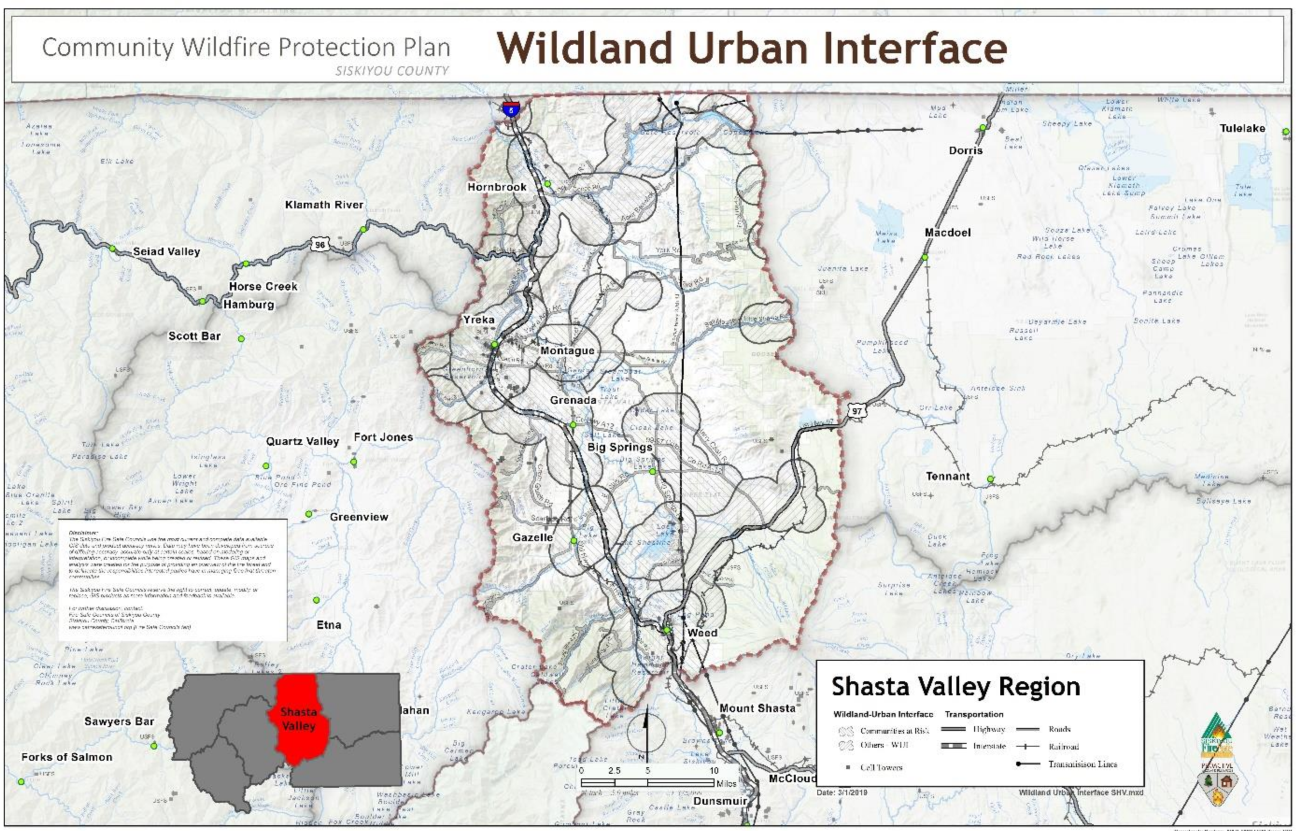
A map of primary roads identified for evacuation routes is an essential tool that should be developed at the local community level. The cartographic/GIS information for this road map information is provided on the FSCSC web site. Larger scale maps can be reproduced for use by community leadership and/or local FSCs. Local FSCs should make it a priority to identify main evacuation routes and prepare a local plan to reduce hazardous fuels along these routes so residents can evacuate safely and first responders/fire-fighting resources can safely access an area.

General Overview/Description

- The Shasta Valley PR is a conglomeration of significant agricultural lands and forested lands that were heavily cut in the late 1800's. Much of the mixed conifer associations managed today are second or third growth forests.
- Dissected by Interstate 5, a major north-south route, Highway 97, Highway 96, and two sections of Union Pacific railroad line.
- The central portion of the PR is primarily grasslands and agriculture.
- There are seven identified Communities at Risk (CAR – see Section 4): Big Springs, Gazelle, Grenada, Hornbrook, Montague, Weed, and Yreka.
- Most of the residents in the region are in the cities of Yreka, Weed, and Montague.
- Additional WUI communities include, Copco, Edgewood, Hawkinsville, Hilt, Mount Shasta Flat, Klamathon, Lake Shastina and Hammond Ranch.
- Approximate population in the PR is 23,511 (2010 Census, http://factfinder.census.gov).

Figure 1 - General Overview of the Shasta Valley PR

Note: Federal and State of California listed Communities at Risk are annotated by name. WUIs not associated with a CAR are denoted with a number.



Values and Assets at Risk

- Copco Lake, Iron Gate Reservoir, Lake Shastina, Klamath River, Shasta River
- Interstate 5, which is a major west coast travel corridor for transport of goods as well as commuters and travelers
- U.S. Highway 97, which is a major travel corridor for transport of goods as well as commuters and travelers.
- State Highway 96, which is a transportation corridor that follows the Klamath River.
- Union Pacific Railway – this is part of the major north/south rail transportation system.
- Fall Creek Water Supply
- Copco Dam Power Generation
- Roseburg Forest Products Biomass Generation
- Weed airport, Siskiyou County airport, Montague-Yreka airport.
    - Additional assets of significant value that could be threatened with destruction during a wildfire were identified by community members in public workshops and included: structures, residences, electrical power grid lines, parks, lakes, recreation sites, unique habitat for rare, threatened or endangered species, forest resources and cultural/historical sites.

Wildfire Environment

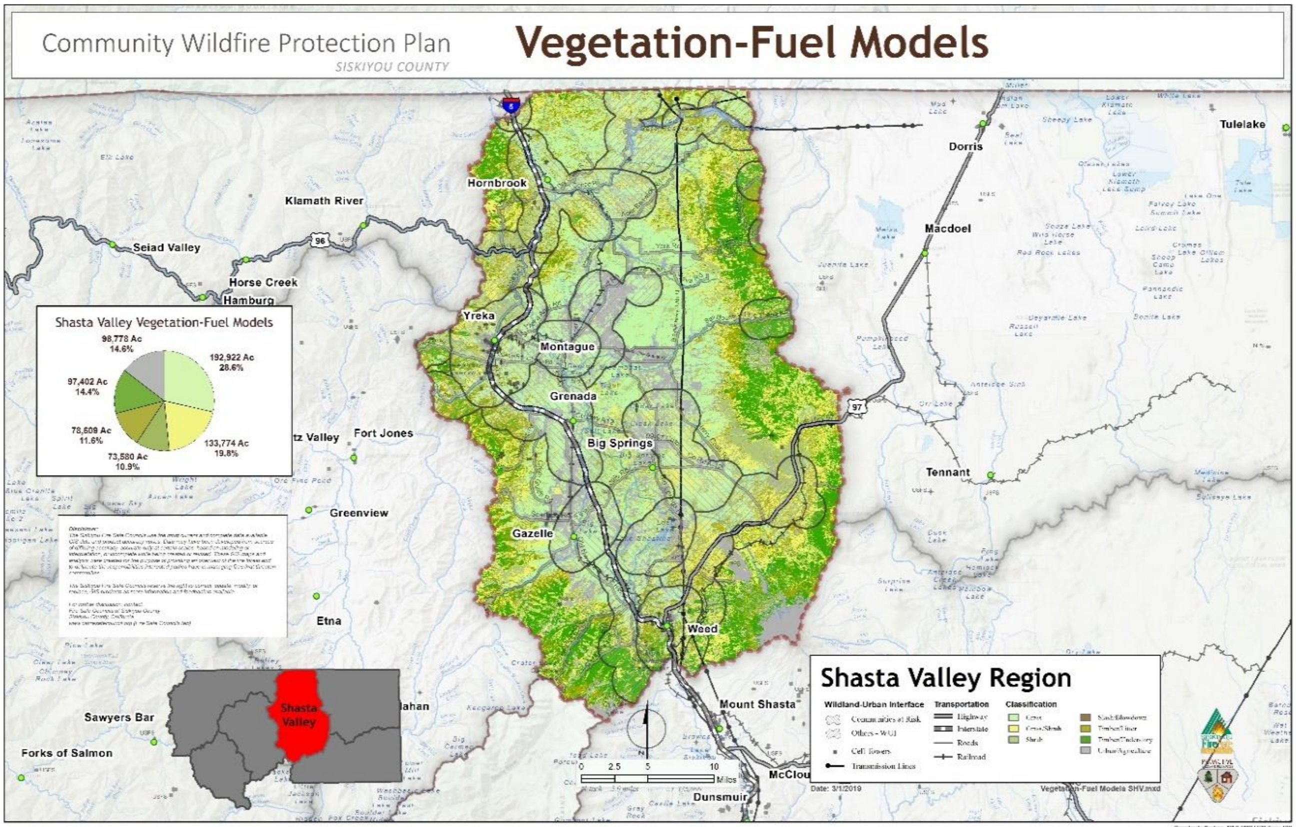
Effective fire suppression has excluded wildfire from many of the plant associations found within the Shasta Valley PR (USDA 1996), resulting in densely vegetated areas dominating much of the area. When fuels and weather are dry, any ignition in windy conditions can immediately create extreme wildfire conditions with rapid rates-of-spread and high intensities. Destructive results in recent years include the Weed area Boles Fire in September 2014 and the Hornbrook area Klamathon Fire in July 2018; both ignitions in WUI during high wind conditions that quickly moved into populated community areas. Both fires caused closures of Interstate 5. The previous decade, the Hotlum Fire in 2006 (a February prescribed fire escape during the mop-up stage) was fanned by extreme pre-frontal winds causing extreme fire behavior. The Hoy Fire in July 2006 also displayed severe fire behavior and threatened homes in the Big Springs/Lake Shastina area. These fires both caused closures of State Highway 97 for brief periods of time.

Fuels

IMPORTANT NOTE

Grass and shrub vegetation dominate this PR covering approximately 60 % of the Shasta Valley area. Ignitions in these light, flashy fuels can quickly become fast moving wildfires – as experienced in both the 2014 Boles and the 2018 Klamathon Fires, areas with similar fuel types.

Figure 2 - Vegetation as translated into major types of burnable vegetation or fuel models



Acres/% Acres of Primary Fuel Types – Shasta Valley PR		
	Acres	% Acres
Grass	192,922	29%
Grass/Shrub	133,774	20%
Shrub	73,580	11%
Timber Litter	78,609	12%
Timber Understory	97,402	14%
Slash/Blowdown	-	0%
Non-burnable	98,778	15%
Total	**675,065**	**100%**

Weather

Three significant types of fire weather conditions that occur during fire season, important in this area of the southern Cascades are: (1) Pacific High (Postfrontal) (2) Pacific High (Prefrontal), and (3) Subtropical High Aloft (Subtropical High) (Fire in CA Ecosystems, 2018).

- *Postfrontal* conditions occur when high pressure follows the passage of a cold front and causes strong foehn winds from the north and northeast. are frequent in springtime and again in late summer and fall.

- *Prefrontal* pattern includes episodes of thunderstorms most common July to August but can occur from June through mid-September. The resulting cells have high bases, much of the precipitation associated with them evaporates before reaching the ground. 'Dry lightning' events often result in many fire ignitions over a relatively short time, a situation that can be rapidly compounded by the associated gusty erratic downdraft winds.
- *Subtropical High Aloft* occurs when stagnant high pressure produces high temperatures and low relative humidity for extended periods. These conditions are often accompanied by periods of high atmospheric instability (Fire in CA Ecosystems, 2018).

Lightning strikes are a common source of ignition. The density of lightning strikes increases from south to north (Fire in CA Ecosystems, 2018). Occasionally, incursions of subtropical moisture moving north from the eastern Pacific and the Gulf of California produce widespread thunderstorms resulting in numerous fires. Hundreds of lightning fires can be ignited over short periods during these events. The occurrence of widespread, simultaneous, lightning ignitions has contributed to fires that burn for weeks and cover very large areas as in 1977, 1987, 1990, 1999, 2008, 2009, 2012, and 2014.

Topography

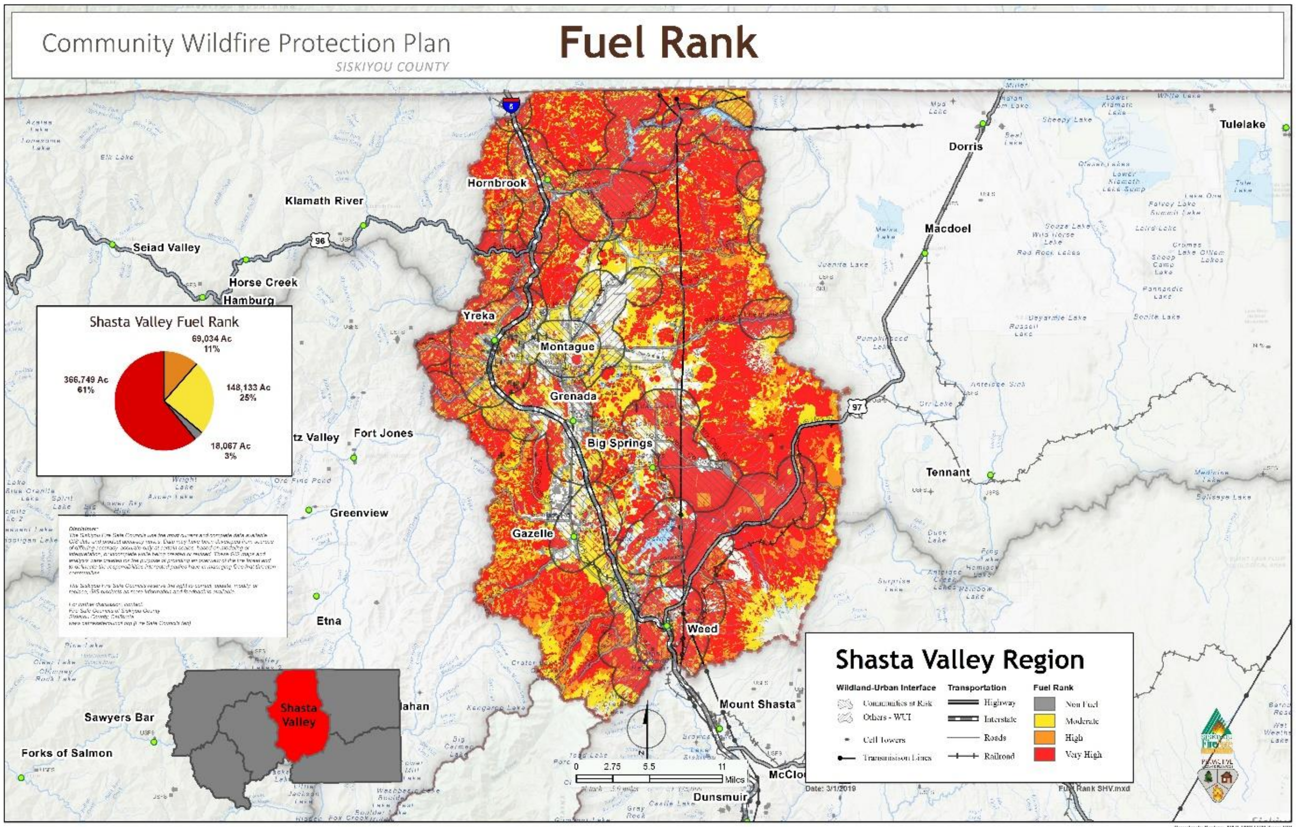
- Topographically, the area is noted for its vast grass/light shrubs valley areas bordered on the east and south by unique volcanically formed butte features and on the west and north by geologically raised mountains surrounding the valleys.
- Elevation ranges from about 1,950 feet along the Klamath River to 14,177 at the top of Mount Shasta.

Expected Fire Behavior

Wildfires in this PR primarily respond to wind and topography. In the expansive central valley landscape wind is the dominant factor propagating wildfire spread; an outcome of pre/post frontal passages, downdrafts from lightning storms or strong prevailing winds. Once a fire reaches the mountainous features surrounding the valley, topography becomes the driving force. Lighter, flashy fuels of the valley areas support fast moving fire spread, typically suppressed before expanding to large size due to quick access by suppression resources and intermittent breaks in fuel continuity including cultivated agriculture lands, grazed areas and road systems. Once the fire encounters steeper slopes and heavier fuels in the outlying foothills and mountain topography, access becomes more difficult and fire intensities increase making suppression tactics more challenging. The 2018 Klamathon Fire clearly exemplifies this rapid acceleration in fire behavior and destructive scenario, finally suppressed at 38,000+ acres.

Figure 3 - Fuel Rank for Shasta Valley PR

Note: Fuel Rank is based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, and temperature). This tool is used by CAL FIRE to prioritize pre-fire projects that reduce the potential for large, catastrophic wildfires. Fuel Rank does not factor in the likelihood of a fire event or fire frequency.



Fuel Rank Acres - Shasta Valley PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Total Result	18,067	148,133	69,034	366,749	601,983

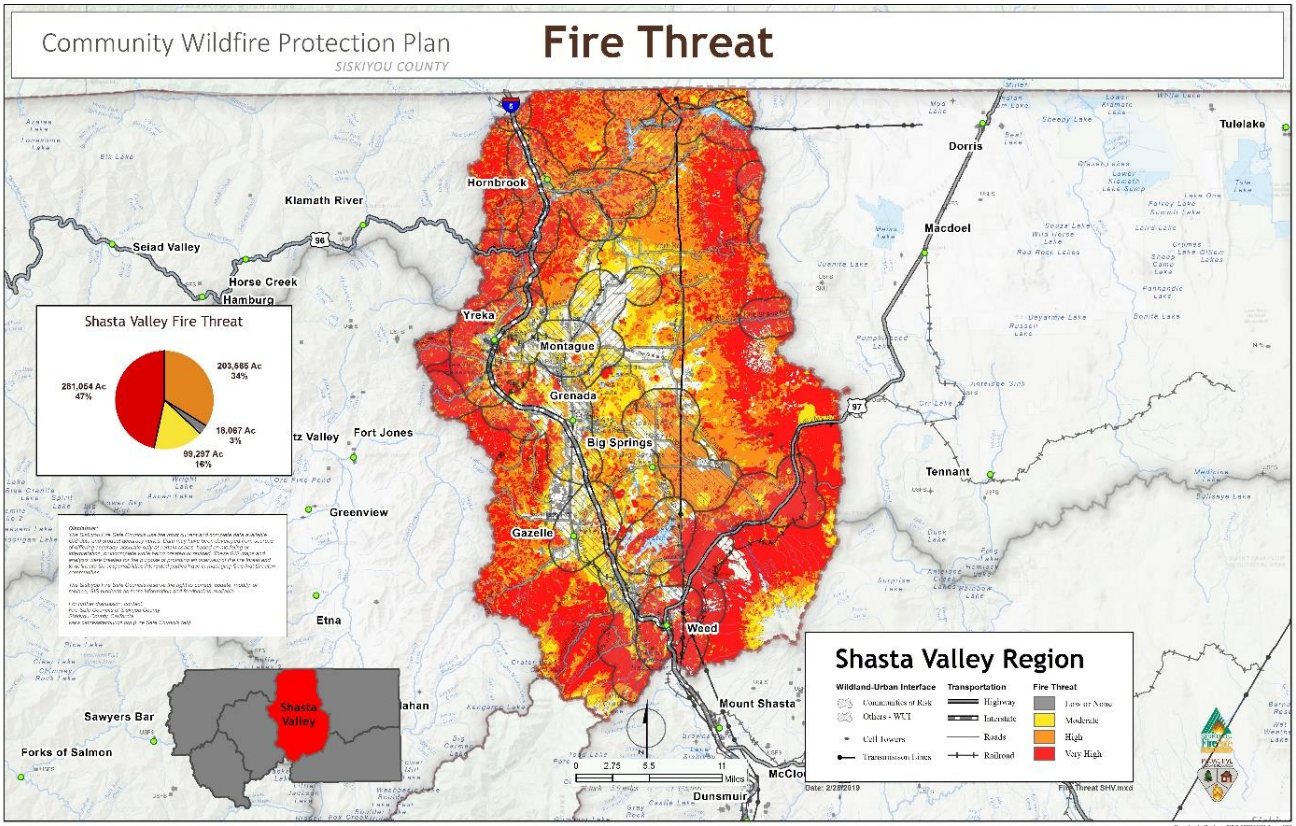
Percent Fuel Rank Acres - Shasta Valley PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Total Result	1%	28%	24%	47%	100%

Communities at Risk: Fuel Rank Acres - Shasta Valley PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total
Big Springs	,137	3,206	706	18,398	**23,446**
Gazelle	1,115	6,246	82	4,179	**11,621**
Grenada	2,831	8,357	1,432	8,765	**21,386**
Hornbrook	826	9,494	1,986	24,314	**36,619**
Lake Shastina	570	1,951	228	8,695	**11,444**
Montague	1,317	4,507	0	1,245	**7,069**
Weed	195	1,398	3,567	10,462	**15,622**
Yreka	1,238	8,349	3,756	12,179	**25,521**
Other WUI Total	2,887	25,189	14,922	81,788	**124,786**
Total All WUI	**12,115**	**68,697**	**26,678**	**170,025**	**277,515**

Communities at Risk: Percent Fuel Rank Acres - Shasta Valley PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total
Big Springs	5%	14%	3%	78%	**100%**
Gazelle	10%	54%	1%	36%	**100%**
Grenada	13%	39%	7%	41%	**100%**
Hornbrook	2%	26%	5%	66%	**100%**
Lake Shastina	5%	17%	2%	76%	**100%**
Montague	19%	64%	0%	18%	**100%**
Weed	1%	9%	23%	67%	**100%**
Yreka	5%	33%	15%	48%	**100%**
Other WUI Total	2%	20%	12%	66%	**100%**
Total All WUI	**4%**	**25%**	**10%**	**61%**	**100%**

Figure 4 - Wildland Fire Threat for Shasta Valley PR

Note: Fire Threat is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes



Fire Threat Acres - Shasta Valley PR					
	Low or None	Moderate	High	Very High	Total Result
Shasta Valley	18,067	99,297	203,565	281,054	601,983

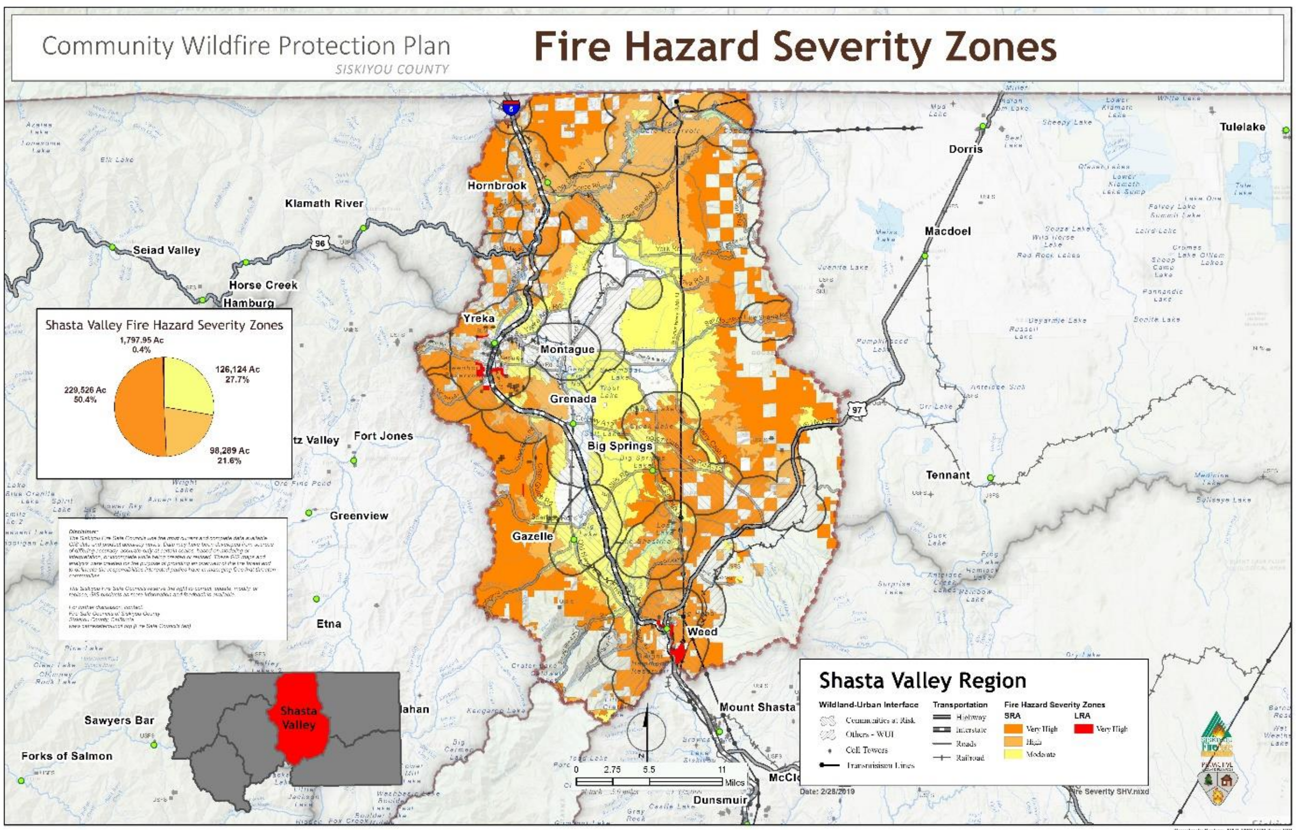
Percent Fire Threat Acres - Shasta Valley PR					
	Low or None	Moderate	High	Very High	Total Result
Shasta Valley	3%	16%	34%	47%	100%

Community at Risk: Fire Threat Acres - Shasta Valley PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Big Springs	1,137	3,717	15,914	2,679	**23,446**
Gazelle	1,115	5,996	3,090	1,420	**11,621**
Grenada	2,831	6,514	6,673	5,367	**21,386**
Hornbrook	826	3,868	16,595	15,331	**36,619**
Lake Shastina	570	1,943	4,170	4,760	**11,444**
Montague	1,317	4,434	1,164	155	**7,069**
Weed	195	1,008	2,200	12,219	**15,622**
Yreka	1,238	5,581	7,165	11,537	**25,521**
Other WUI	2,887	17,556	35,987	68,356	**124,786**
Total All WUI	**12,115**	**50,617**	**92,959**	**121,824**	**277,515**

Community at Risk: Percent Fire Threat Acres - Shasta Valley PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Big Springs	5%	16%	68%	11%	**100%**
Gazelle	10%	52%	27%	12%	**100%**
Grenada	13%	30%	31%	25%	**100%**
Hornbrook	2%	11%	45%	42%	**100%**
Lake Shastina	5%	17%	36%	42%	**100%**
Montague	19%	63%	16%	2%	**100%**
Weed	1%	6%	14%	78%	**100%**
Yreka	5%	22%	28%	45%	**100%**
Other WUI	2%	14%	29%	55%	**100%**
Total All WUI	**4%**	**18%**	**33%**	**44%**	**100%**

Wildland Fire Severity

Figure 5 - Fire Severity is a legislatively required fire behavior variable

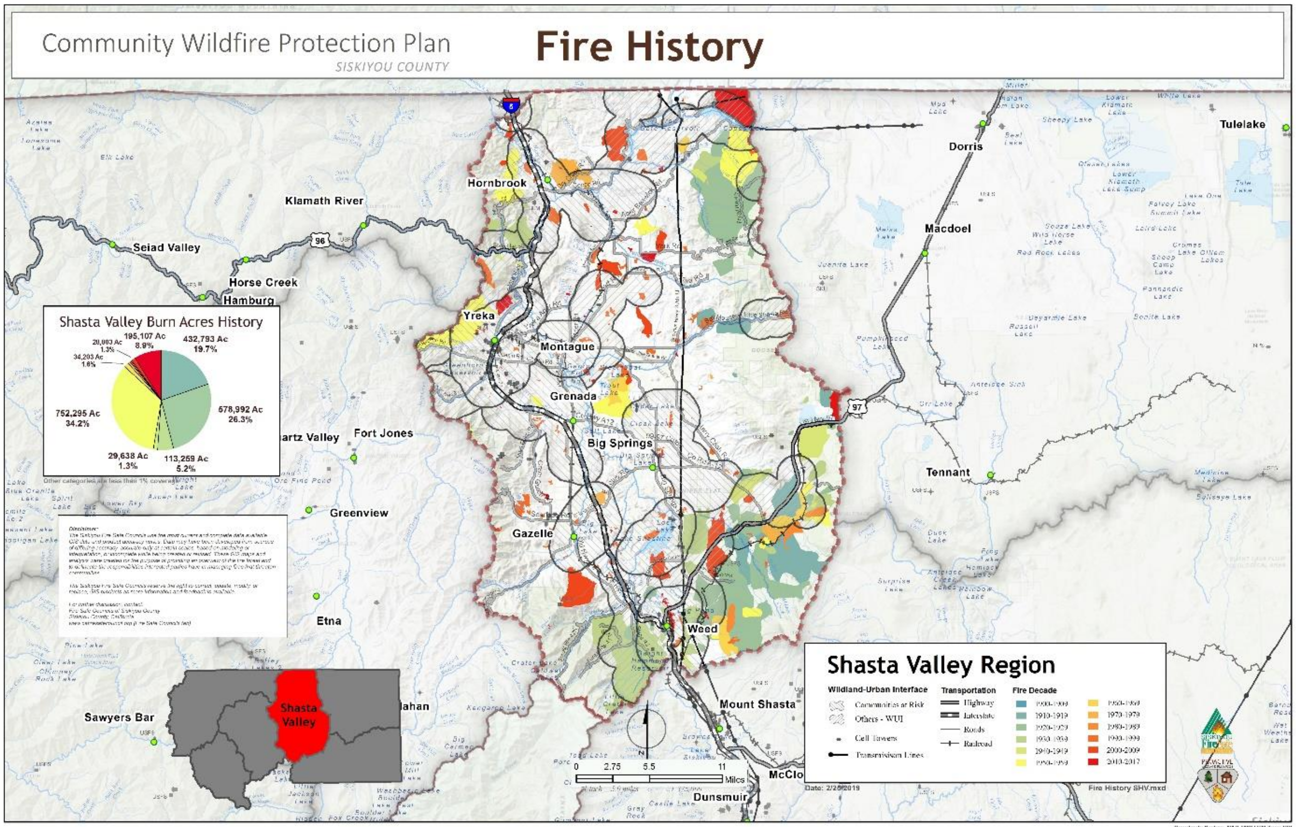


Severity Acres - Shasta Valley PR				
Responsibility	Moderate	High	Very High-SRA Very High-LRA	Total
State	126,124	98,289	229,526	453,939
Local			1,798	1,798

Severity Acres by % Acres - Shasta Valley PR				
Responsibility	Moderate	High	Very High-SRA Very High-LRA	Total
State	28%	22%	50%	100%
Local			100%	100%

Fire History

Figure 6 - Fire History Identified by decade (1900-2017) for Shasta Valley PR



Community Preparedness Aspects

Water sources in Shasta Valley are critical in wildfire suppression actions. There are a few scattered well known (and mapped) year-round lakes; but there are also vast areas with no water when the intermittent stream corridors dry out, mid-late summer and into fall.

- It is important that fire suppression personnel and community members are fully aware of water sources; communicate with their local FSC's and fire departments about the locations; map them and be sure they are noted and kept current in their local level CWPPs.
- Communities not covered in local CWPP should be working directly with their area wildfire agency personnel to ensure all water sources are located and identified on a 'unit map' and updated regularly.

Descriptions and lists of activities and efforts by community citizens and groups to improve fire safety in their areas should be compiled by the local Fire Safe Council.

- Active Fire Safe Councils (FSCs)
    - Black Mountain FSC

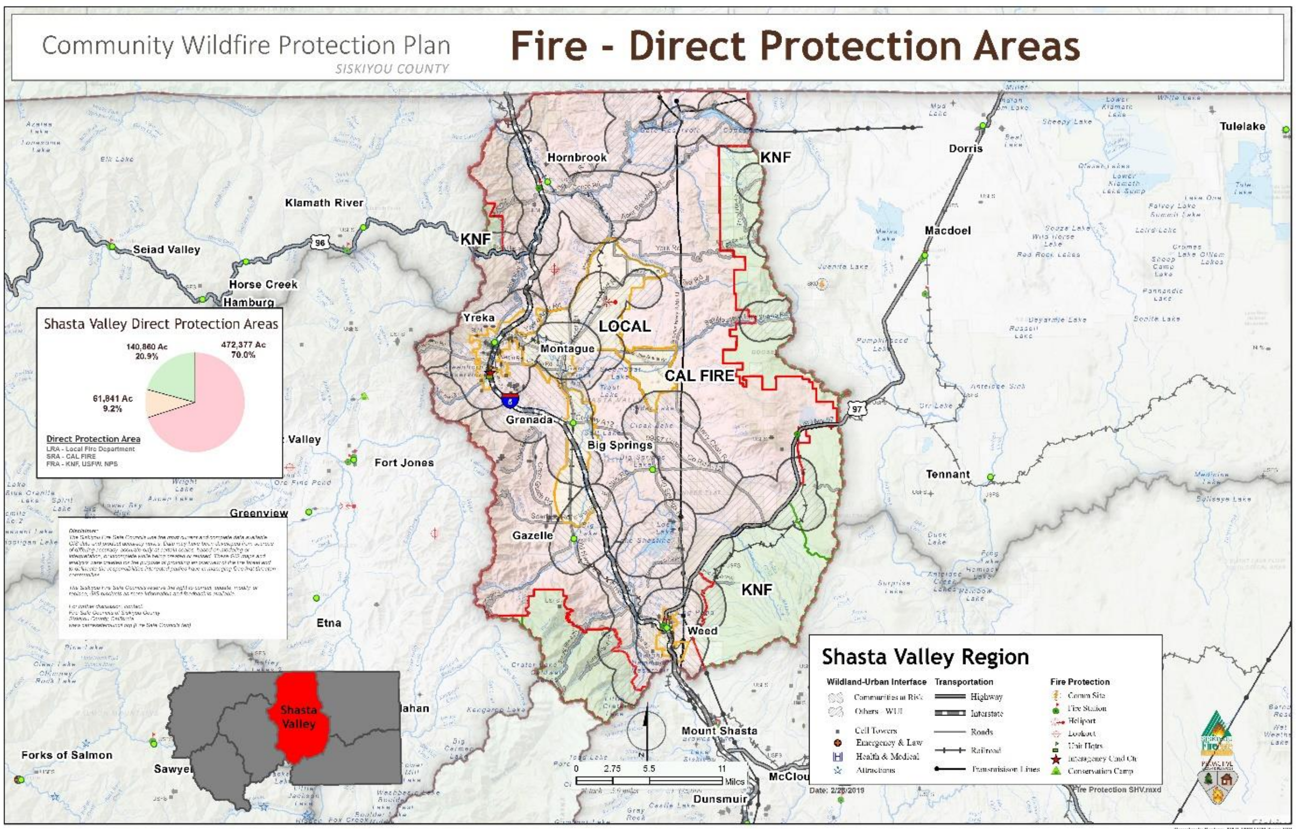
- Copco/Bogus Mountain FSC
- Hammond Ranch FSC
- Greater Weed Area FSC
- Juniper Flats FSC
- Greater Lake Shastina FSC
- Yreka Area FSC

- For ongoing fuels reduction projects contact your local community FSC representative

- See Pre-Fire Projects – as listed in CAL FIRE Siskiyou Unit (see *Appendix E*)

Wildfire Protection

Figure 7 - Fire Direct Protection Areas for Shasta Valley PR



- Fire protection agencies/protection entities:
  - CAL FIRE / Siskiyou Unit Headquarters, 2 Battalion Chiefs, 6 engines (2 in Yreka, 2 in Weed, and 2 in Hornbrook), 1 dozer and Fire Prevention Officers
  - USFS Klamath NF / KNF Headquarters, 1 dozer, Siskiyou County Air Tanker Reload Base: T1 helicopter (if on contract) and an air attack platform
  - Community / volunteer fire departments: engines housed at each of the stations (Yreka Volunteer FD, Weed City Volunteer FD, Gazelle FD, Lake Shastina FD,

Montague FD, Grenada FPD, Hammond Ranch Volunteer), Copco Lake FD, South Yreka FPD, Mt. Shasta Vista Volunteer FC, Hammond Ranch, Hornbrook Volunteer FD, Hilt-Colestin Rural FD, Mayten FD).

NOTE: Equipment & typical staffing/personal numbers will vary based on needs and funding *(refer to local CWPPs or call area representative wildfire protection agency for current/updated staffing info)*

- Primary concerns and challenges faced by protection forces:

#1 = Access-egress routes are amongst the highest priority safety elements in a wildfire emergency.

- Evacuation Route Mitigation Actions are a necessity for life safety of citizens and emergency personnel

Evacuation route assessment should include, but is not limited to:

- ✓ Roadbed width and adequate pullouts
- ✓ Roadside vegetation clearance
- ✓ Roadside power-pole and power line clearance
- ✓ Signing of existing residence(s) on side roads
- ✓ Clear marking of fire hydrant/water sources

IMPORTANT NOTE: Shasta Valley PR leadership, citizens and interagency cooperators should expand on a list of challenges and mitigation actions in FSC level and/or community level meetings.

Contact information for local fire protection services:

State Resources

- **CAL FIRE Station Yreka**:
  1809 Fairlane Rd, Yreka, CA 96097 | (530) 842-4359
  http://www.calfire.ca.gov/contacts/station?SID=752
- **CAL FIRE Station Weed**:
  300 Highway 97, Weed, CA 96094 | (530) 938-2322
  http://www.calfire.ca.gov/contacts/station?SID=751
- **CAL FIRE Station Hornbrook**:
  14638 Bradley Henley Rd, Hornbrook, CA 96044 | (530) 475-3582
  http://www.calfire.ca.gov/contacts/station?SID=747

Federal Resources

- **Klamath National Forest**
  1711 S. Main St, Yreka, CA 96097 / (530) 842-6131
  https://www.fs.usda.gov/klamath

Local Community & Volunteer Resources

- **Copco Lake Fire Department**
  27805 Copco RD, Montague, CA 96064 | (530) 459-0434
- **Gazelle Volunteer Fire Department:**
  18338 Old Highway 99, Gazelle, CA 96034 | (530) 435-2331
- **Grenada Fire Protection District:**
  6055 4th Ave, Grenada, CA 96038 | (530) 436-2200
- **Hilt- Colestin Rural Fire District**
  1701 Colestin Rd, Ashland, OR 97520 | (541) 488-1768
- **Hornbrook Volunteer Fire District**
  16100 Front St., Hornbrook, CA 96044 | (530) 340-5652
- **Hammond Ranch Volunteer Fire Company:**
  8800 N. Old Stage Rd, Weed, CA 96094 | (530) 938-4200
- **Lake Shastina Volunteer Fire Department:**
  16309 Everhart Dr, Weed, CA 96094 | (530) 938-3161
- **Mayten Fire District:**
  7427 HWY A-12, Montague, CA 96064 | (530) 459-5210
- **Montague Fire Department:**
  121 South 10th St, Montague, CA 96064 | (530) 459-5343
- **Mt. Shasta Vista Volunteer Fire Company:**
  13502 Roland Dr. Montague, CA 96064 | (530) 340-2297
- **South Yreka Fire Protection District**
  3420 Easy St. Yreka, CA 96097 | (530) 842-1477
- **Weed City Volunteer Fire Department:**
  128 Roseburg Parkway, Weed, CA 96094 | (530) 938-5030
- **Yreka Fire Department**
  401 W. Miner St, Yreka, CA 96097 | (530) 841-2383

Evacuation

IMPORTANT EVACUATION INFORMATION:
Refer to Section 6.4 Evacuation for helpful pre-emergency tools, websites, and general procedures regarding area evacuations.

A map of primary roads identified for evacuation routes is an essential tool that should be developed at the local community level. The cartographic/GIS information for this road map information is provided on the FSCSC web site. Larger scale maps can be reproduced for use by community leadership and/or local FSCs. Local FSCs should make it a priority to identify main evacuation routes and prepare a local plan to reduce hazardous fuels along these routes so residents can evacuate safely and first responders/fire-fighting resources can safely access an area.

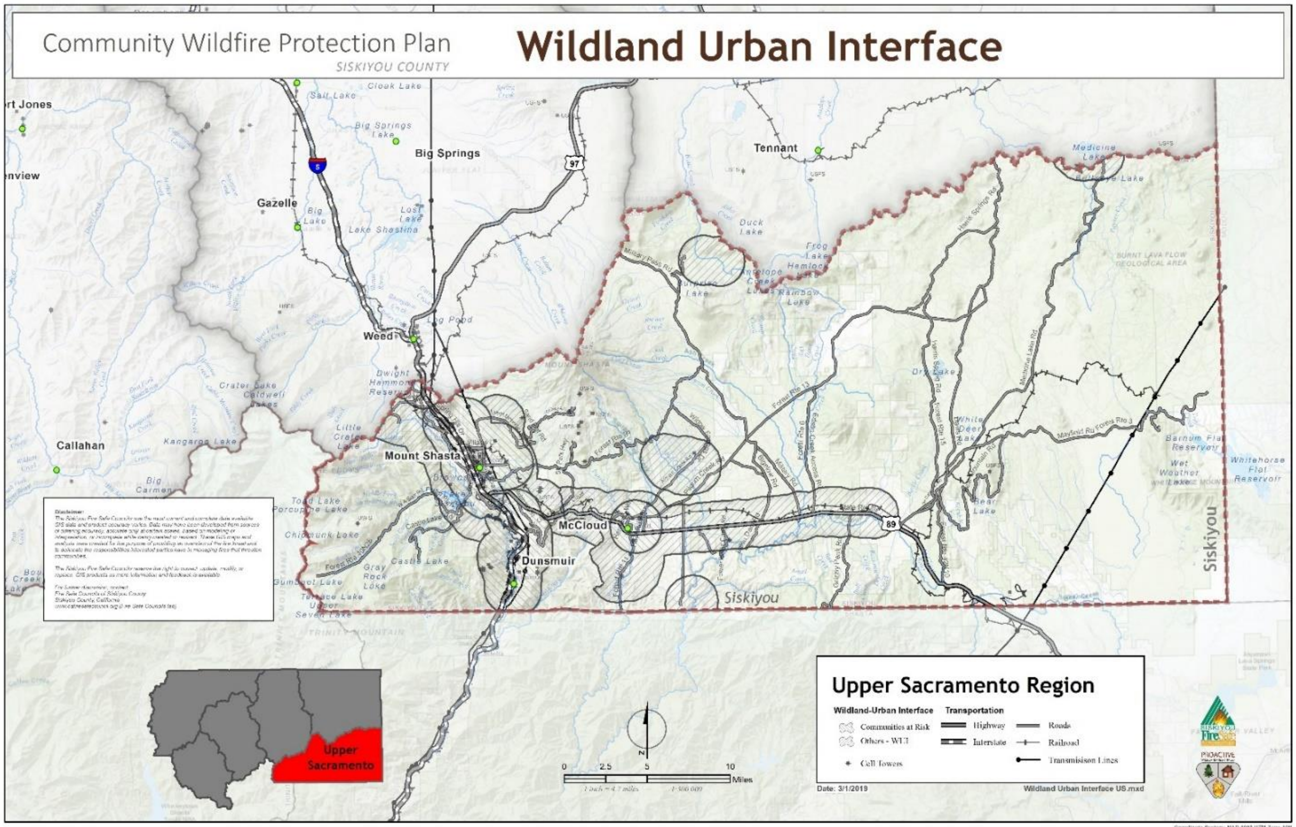
6. Upper Sacramento Planning Region

General Overview/Description

- The inland Cascade Range meets the Klamath Mountains forming the diverse terrain of the Upper Sacramento PR.
- The southern portion of this PR presents steep canyon watersheds with dense mixed conifer forest surrounding the source of California's primary water corridor, the Sacramento River.
- On the northern-central PR boundary lies Mount Shasta, a massive volcano and 2nd highest peak in California; a prominent and popular landmark visible for many miles in all directions.
- Beyond the eastern crest of Sacramento Canyon, eastside of Mount Shasta, the vast landscape changes dramatically as the terrain flattens, characterized by the spread pattern of ancient lava flows and system of tubes, topped with nutrient-rich volcanic soils from the more recent mud-flow events.
- Major dissecting travel infrastructure includes north-south arteries of Interstate Highway 5 and Union Pacific railroad line; State Highway 89 is a west-easterly travel corridor.
- Logging and timber production began in the 1890's and prevailed through the mid-1990's at which time the accessible McCloud Flats area produced more product off federal lands than any other forest in the entire state. McCloud River Railroad Company played a significant role in the early logging days.
- There are three identified Communities at Risk (CAR – see Section 4): Dunsmuir, McCloud, and Mount Shasta.
- The Mount Shasta City area is home to the highest number of residents; Dunsmuir and McCloud maintain a smaller somewhat stable population.
    - Additional WUI Communities include: Shasta Forest, Pondosa,
    - Approximate population in the PR estimated by the 3 primary zip codes is 10,830 (2010 Census, http://factfinder.census.gov).

Figure 1 - General Overview of the Upper Sacramento PR

Note: Federal and State of California listed Communities at Risk are annotated by name. WUIs not associated with a CAR are denoted with a number.



Values and Assets at Risk

- Aquatic and timber resources are fundamental assets providing drinking water and lumber products regionally and statewide.
- Recreation and tourism abound as the many natural wonders attract local, state, national and international visitors: an array of activities affiliated with Mt. Shasta, i.e., climbing, hiking, skiing, biking-riding; prestigious alpine lakes and rivers (including 'Wild and Scenic Designated' McCloud River) for water sports and top-notch fly-fishing; and extensive systems of forested trails and roads for exploration.
- U.S. Interstate Highway 5 (I-5) is a major travel corridor for transport of goods as well as commuters and travelers; State Route Highway 89 initiates at I-5 just south of the city of Mt. Shasta, providing a key east-west transportation route.
- Union Pacific Railway is part of the major north/south rail transportation system for passengers and goods, as is the Amtrak station in Dunsmuir.
- The California Oregon Transmission Project consists of 340-miles of 500-kV AC transmission line between Southern Oregon and Central California and passes through the east portion of this PR. PacifiCorp owns transmission lines along the I-5 corridor, regulated by Pacific Power Company.

- Additional assets of significant value that could be threatened with destruction during a wildfire were identified by community members in public workshops and included: structures, residences, electrical power grid lines, parks, lakes, recreation sites, unique habitat for rare, threatened or endangered species, forest resources and cultural/historical sites.

Wildfire Environment

For wildfire assessment purposes the Upper Sacramento PR was divided along the prominent ridgelines (Soda and Girard ridges) east of the Sacramento corridor, dissecting Mt Shasta into east and west slope portions. These areas may often be termed 'westside' and 'eastside'. This division was incorporated to improve assessment work due to markedly different terrain features, fuels and weather factors from west to east. These subsequent differences largely influence wildfire behavior and fire ecology across the PR. Several tables that follow will permit the reader to look at the differences between the two sub-regions with respect to fuels/vegetation, fuel rank (fire behavior) and fire threat.

Studies of historical fire regimes (patterns and frequency) show that vegetation and topography strongly influence the fire regime. Frequent fires and fire-scarred trees that have survived previous fires suggest that the fire regime was characterized by low-to-moderate severities (Skinner et al. 2006). With successful fire suppression, fuels and vegetation density have increased and fires have the potential to become more intense and difficult to control (USDA, Shasta-Trinity N.F., 2011).

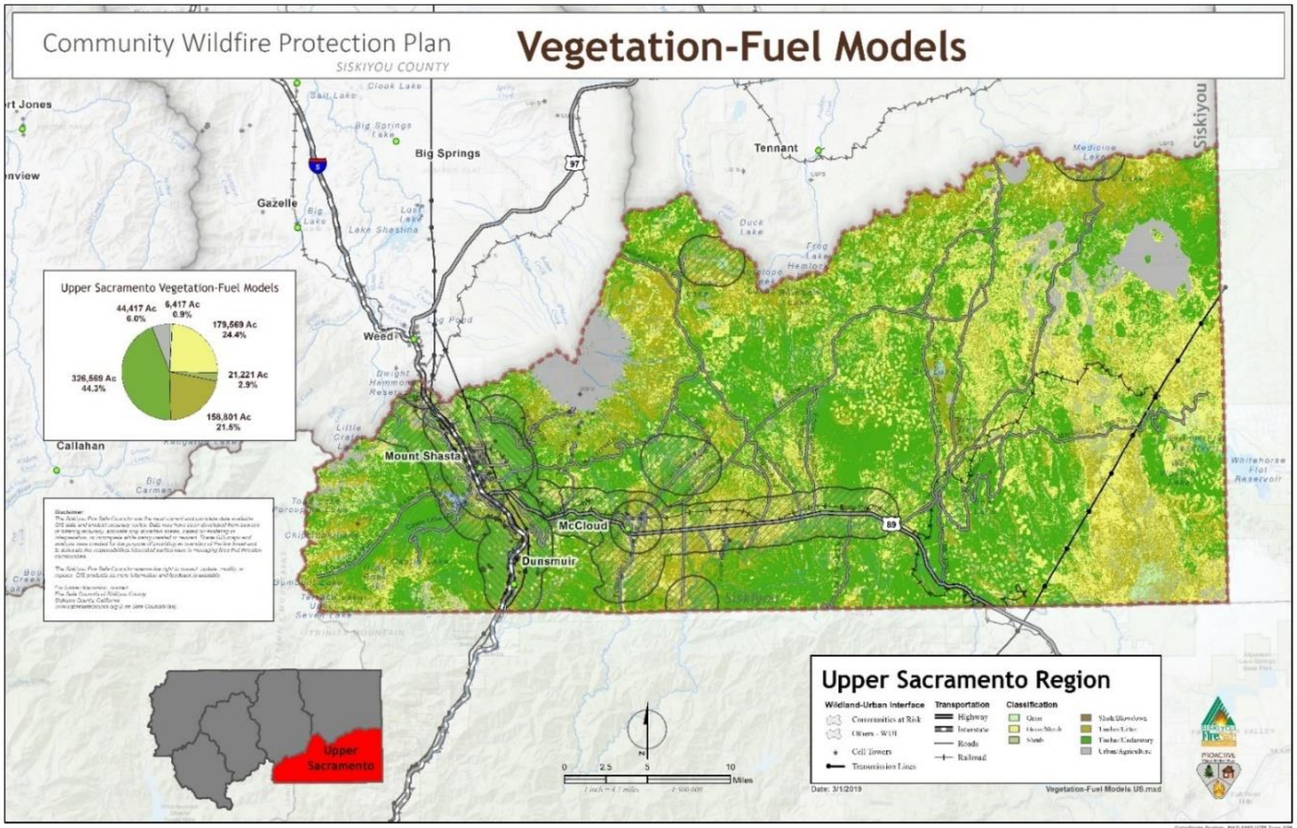
- The Sacramento corridor (west portion of this PR) is characterized by steep heavily vegetated with timber and brush, upslope of the most heavily utilized travel corridor in northern CA. Wildfire spread is typically slope and fuels driven, with wind an accelerant to fire spread rates.
- The McCloud Flats (east portion of this PR), is distinguished by a vast gentle, often flat, landscape with coniferous forests that phase to intermittently timbered with shrub species becoming prevalent in the farther eastern portion typified by shallow soil surface and rocky lava bed rock. In this gentle terrain the wind factor will generally be the primary factor affecting a wildfire's potential to spread.

Fuels

IMPORTANT NOTE

Heavily timbered forest vegetation occurs on the steeper westside terrain depicted and on an extensive portion of the eastside, estimated to cover approximately 66% of the PR. Grass/Shrub is the second largest coverage comprising an estimated 24%. Recent fires that exemplify extent and severity of wildfire effects include the Hirz Fire, September 2018 and the Bagley Fire, August 2012.

Figure 2 - Vegetation as translated into major types of burnable vegetation or fuel models



Acres/% Acres Primary Fuel Types - Upper Sacramento PR						
	East		West		Total	
	Acres	% Acres	Acres	% Acres	Acres	% Acres
Grass	1,378	1%	5,039	1%	6,417	1%
Grass/Shrub	19,685	15%	159,884	26%	179,569	24%
Shrub	2,225	2%	18,997	3%	21,222	3%
Timber Litter	24,141	18%	134,660	22%	158,801	22%
Timber Understory	72,038	55%	254,531	42%	326,570	44%
Slash/Blowdown	-	0%	-	0%	-	0%
Non-burnable	12,695	10%	31,721	5%	44,416	6%
Total	**132,162**	**100%**	**604,832**	**100%**	**736,995**	**100%**

Weather

Summers are warm and dry and winter precipitation falls as snow at higher elevations. Generally, these conditions support vigorous forest vegetation growth rates. By late summer this thick dry fuelbeds can be easily sparked by a wildfire ignition. The development of persistent high-pressure ridges along the Pacific Coast in winter reduces the amount and timing of annual precipitation and contributes to earlier onset summer conditions and warmer dryer fire seasons (Trouet et al. 2009).

<u>Westside of PR</u>: Three significant types of fire weather conditions that occur during fire season, important in the southern Cascades are: (1) Pacific High (Postfrontal) (2) Pacific High (Prefrontal), and (3) Subtropical High Aloft (Subtropical High). (Fire in CA Ecosystems, 2018)

- *Postfrontal* conditions occur when high pressure follows the passage of a cold front and causes strong foehn winds from the north and northeast. are frequent in springtime and again in late summer and fall.
- *Prefrontal* pattern includes episodes of thunderstorms most common July to August but can occur from June through mid-September. The resulting cells have high bases, much of the precipitation associated with them evaporates before reaching the ground. 'Dry lightning' events often result in many fire ignitions over a relatively short time, a situation that can be rapidly compounded by the associated gusty erratic downdraft winds.
- *Subtropical High Aloft* occurs when stagnant high pressure produces high temperatures and low relative humidity for extended periods. These conditions are often accompanied by periods of high atmospheric instability (Fire in CA Ecosystems, 2018).

Lightning strikes are a common source of ignition. The density of lightning strikes increases from south to north (Fire in CA Ecosystems, 2018). Occasionally, incursions of subtropical moisture moving north from the eastern Pacific and the Gulf of California produce widespread thunderstorms resulting in numerous fires. Hundreds of lightning fires can be ignited over short periods during these events. The occurrence of widespread, simultaneous, lightning ignitions has contributed to fires that burn for weeks and cover very large areas as in 1977, 1987, 1990, 1999, 2008, 2009, 2012, and 2014.

<u>Eastside of PR</u>: There are <u>three primary fire weather patterns</u> that can significantly affect fire behavior and natural ignitions in this northeastern area during the May-to-October fire season: (1) Pre-frontal Winds, (2) Lightning with Low Precipitation, and (3) Strong Subsidence/Low Relative Humidity patterns (Fire in California Ecosystems, 2018).

- *Prefrontal wind events* are frequent in springtime and again in late summer and fall. They are of most consequence in the latter period, when both live and dead fuel moistures are low. This pattern usually occurs between 5 and 10 times a year, with one or two significant events during the fall season of most years. These conditions can lead to rapid fire spread and extreme fire behavior.
- *Lightning and low precipitation* pattern includes episodes of thunderstorms most common July to August but can occur from June through mid-September. The resulting cells have high bases, much of the precipitation associated with them evaporates before reaching the ground. 'Dry lightning' events often result in many fire ignitions over a relatively short time, a situation that can be rapidly compounded by the associated gusty erratic downdraft winds.

- *Strong Subsidence/Low Relative Humidity* with enough duration, cause a significant increase in northeastern California fire potentials, even without much wind. The pattern occurs when a strong mid- and/or upper level high-pressure area is centered to the west of northeastern California for a period of at least several days. Daytime minimum RH usually drops to 4–12%, but nighttime recovery is very low, reaching only the 15–30% range. Dead fuel moistures drop, live fuels become more stressed, and fires ignite, spread, and spot more easily.

Topography

- Fire history studies illustrate that fire severity is strongly influenced by topography, especially slope, aspect, elevation, and slope position.
- The steep slopes of the Upper Sacramento canyon form the apex (uppermost and narrowest) of the Sacramento river basin. This narrowing canyon feature can have a funneling effect and accelerate winds as they move up the canyon corridor, rapidly increasing wildfire behavior.
- Pre-fire suppression era studies reveal that upper thirds of slopes and ridgetops, especially south- and west-facing aspects, experienced the highest proportion of high-severity burns. (Fire in CA Ecosystems, 2018)
- Elevation ranges from about 2,250 feet along the Sacramento River/Dunsmuir area to 14,179 feet at the top of Mount Shasta.

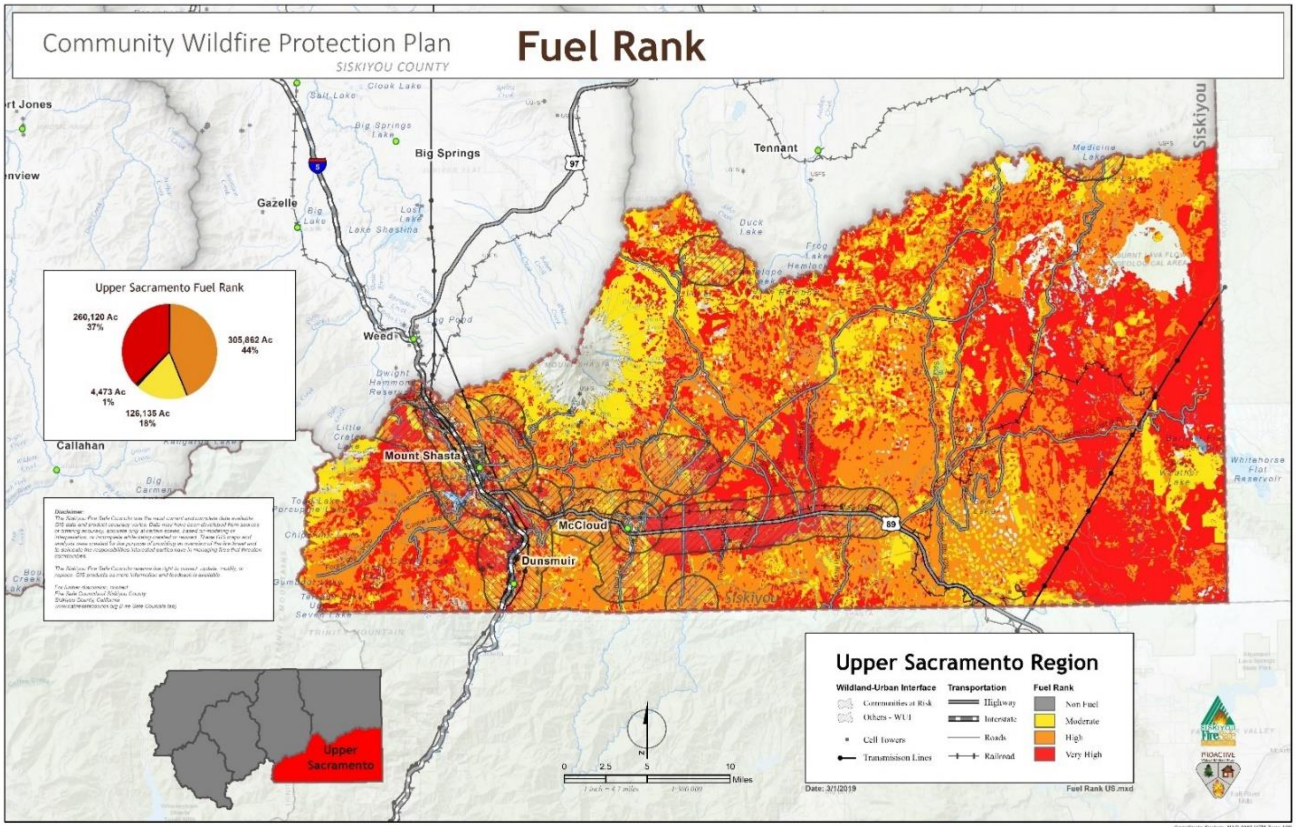
Expected Fire Behavior

- On the west side Sacramento river corridor portion, dominated by dense coniferous forest on steep canyon slopes with openings of dense Manzanita-dominated brush fields. Generally the thickly forested areas require a longer period of time to dry out. In recent history, wildfire ignitions during spring and early to mid-summer are mostly suppressed quickly at small acreages. However, in late summer and fall when the fuels and forest floors are dry, ignitions can quickly escape suppression action. The steep slopes and funneling effect of canyon winds will accelerate the fire's spread and the dense forest vegetation burn with intensities that evade both ground and air suppression tactics.

- On the eastside large expanses of managed forests intermingle with thick unmanaged areas primarily in gentler terrain that flattens moving eastward where timber is intermittent with brush-fields. Like the westside of the PR, wildfire ignitions during spring and early to mid-summer are mostly suppressed quickly at small sizes, whereas ignitions in late summer to late fall are more likely to be problematic. Winds are the primary factor that can fan wildfires from a gentle ground fire stage to a running crown fire in this eastside country. Detection of fires in the flat, largely untraveled area is also a problem. Often fires burn undetected for quite some time and are discovered by aircraft or fire lookout.

Figure 3 - Fuel Rank for Upper Sacramento PR

Note: Fuel Rank is based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, and temperature). This tool is used by CAL FIRE to prioritize pre-fire projects that reduce the potential for large, catastrophic wildfires. Fuel Rank does not factor in the likelihood of a fire event or fire frequency.



Fuel Rank Acres - Upper Sacramento PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Upper Sacramento - East	1,247	20,138	63,313	37,472	122,171
Upper Sacramento - West	3,226	105,997	242,549	222,647	574,419
Total	**4,473**	**126,135**	**305,862**	**260,120**	**696,590**

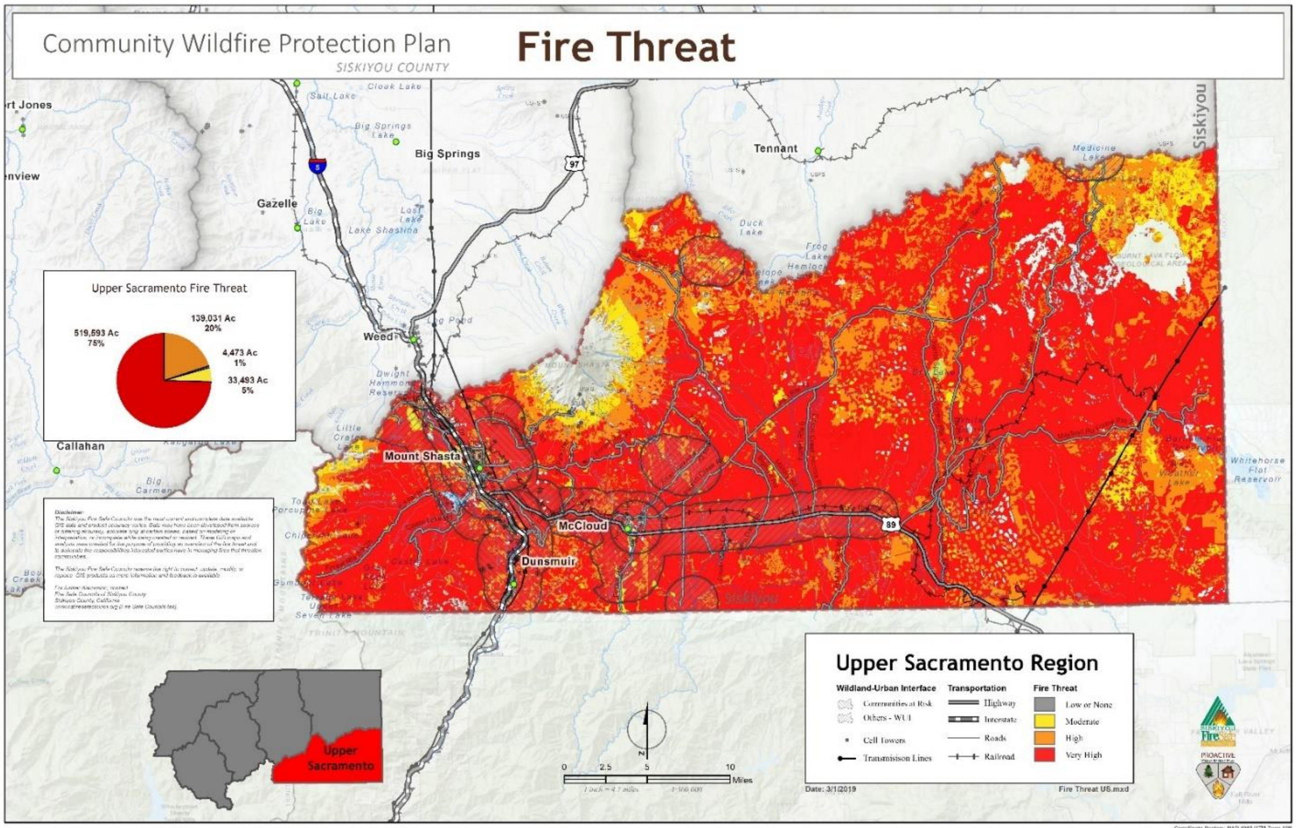
Percent Fuel Rank Acres - Upper Sacramento PR					
	Non-Fuel	Moderate	High	Very High	Total Result
Upper Sacramento - East	1%	16%	52%	31%	100%
Upper Sacramento - West	1%	18%	42%	39%	100%
Total	**1%**	**18%**	**44%**	**37%**	**100%**

Communities at Risk: Fuel Rank Acres - Upper Sacramento PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total
Dunsmuir	197	1,590	7,291	5,946	**15,024**
McCloud	36	441	2,616	1,410	**4,503**
Mount Shasta	75	2,771	9,343	5,303	**17,491**
Weed	11	32	531	725	**1,299**
Other WUI Total	132	10,191	38,277	27,937	**76,537**
Total All WUI	**450**	**15,025**	**58,058**	**41,321**	**114,853**

Communities at Risk: Percent Fuel Rank Acres - Upper Sacramento PR					
Community at Risk	Non-Fuel	Moderate	High	Very High	Total
Dunsmuir	1%	11%	49%	40%	**100%**
McCloud	1%	10%	58%	31%	**100%**
Mount Shasta	0%	16%	53%	30%	**100%**
Weed	1%	2%	41%	56%	**100%**
Other WUI Total	0%	13%	50%	37%	**100%**
Total All WUI	**0%**	**13%**	**51%**	**36%**	**100%**

Figure 4 – Wildland fire Threat for Upper Sacramento PR

Note: Fire Threat is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes.



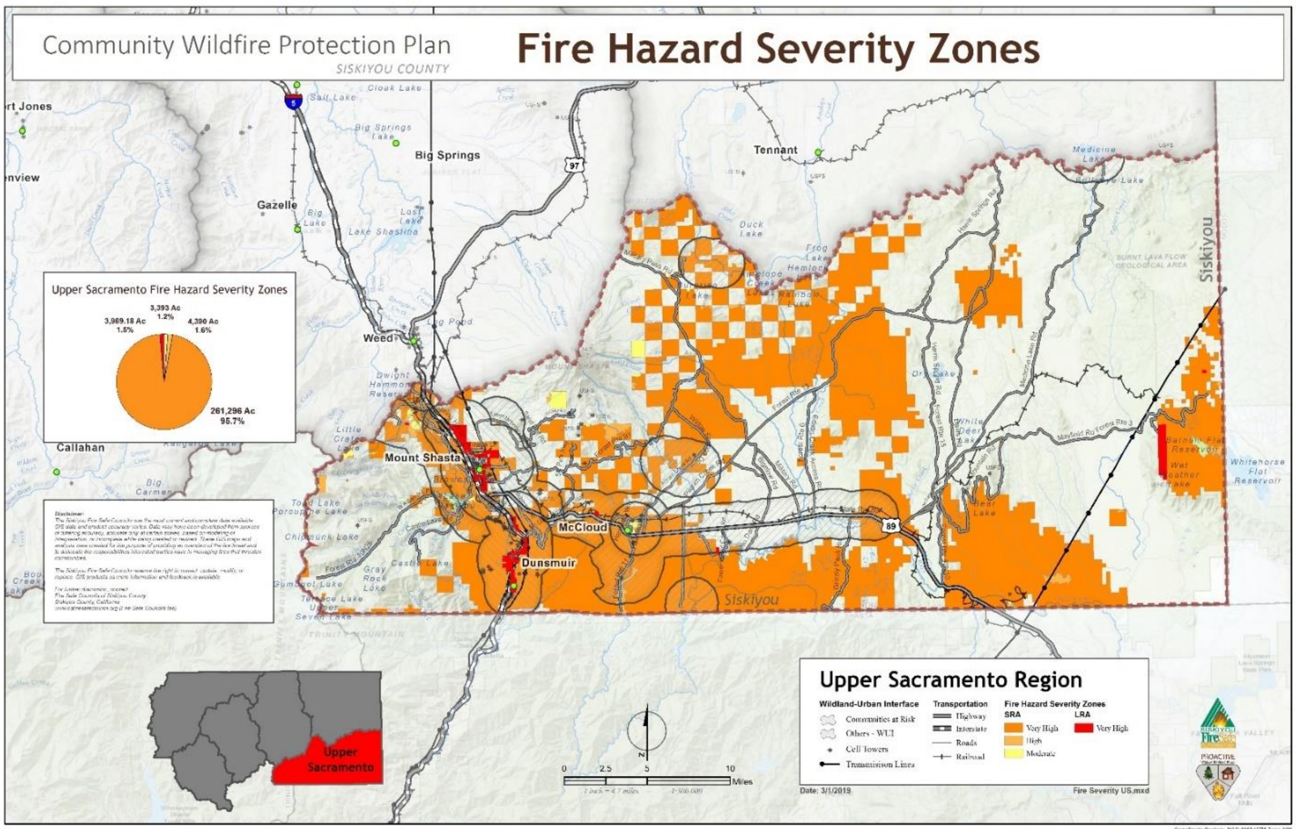
Community at Risk: Fire Threat Acres - Upper Sacramento PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Dunsmuir	197	48	2,737	12,042	**15,024**
McCloud	36	245	405	3,817	**4,503**
Mount Shasta	75	1,322	2,557	13,537	**17,491**
Weed	11	73	102	1,112	**1,299**
Other WUI	132	1,773	11,453	63,180	**76,537**
Total All WUI	**450**	**3,462**	**17,254**	**93,688**	**114,853**

Community at Risk: Percent Fire Threat Acres - Upper Sacramento PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Dunsmuir	1%	0%	18%	80%	**100%**
McCloud	1%	5%	9%	85%	**100%**
Mount Shasta	0%	8%	15%	77%	**100%**
Weed	1%	6%	8%	86%	**100%**
Other WUI	0%	2%	15%	83%	**100%**
Total All WUI	**0%**	**3%**	**15%**	**82%**	**100%**

Community at Risk: Percent Fire Threat Acres - Upper Sacramento PR					
Community at Risk	Low or None	Moderate	High	Very High	Total
Dunsmuir	1%	0%	18%	80%	**100%**
McCloud	1%	5%	9%	85%	**100%**
Mount Shasta	0%	8%	15%	77%	**100%**
Weed	1%	6%	8%	86%	**100%**
Other WUI	0%	2%	15%	83%	**100%**
Total All WUI	**0%**	**3%**	**15%**	**82%**	**100%**

Wildland Fire Severity

Figure 5 - Fire Severity is a California State legislatively required fire behavior variable



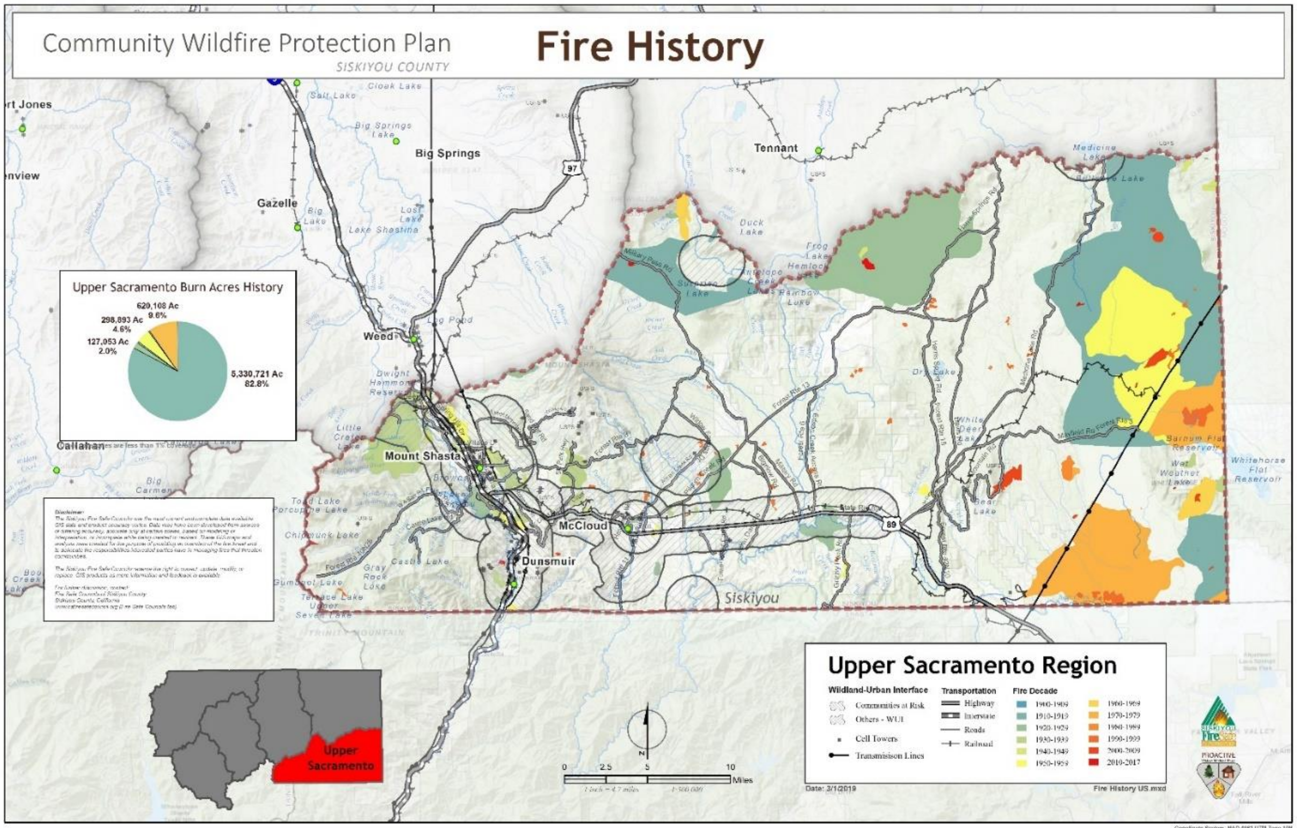
Severity Acres - Upper Sacramento PR				
Responsibility	Moderate	High	Very High-SRA / Very High-LRA	Total
State	3,393	4,390	261,296	269,078
Local			3,969	3,969

Severity Acres by % Acres - Upper Sacramento PR				
Responsibility	Moderate	High	Very High-SRA / Very High-LRA	Total
State	1%	2%	97%	100%
Local			100%	100%

Fire History

Throughout an extensive portion of the PR, the past century displays a notable absence of large fire activity, includes the populous Sacramento corridor. This is noteworthy (well termed: 'A Heads-Up' situation) as the vegetation surrounding the WUI area continues to grow thicker on steep slopes, increasing the overall wildfire severity potential.

Figure 6 - Fire History Identified by decade (1900-2017) for Upper Sacramento PR



Community Preparedness Aspects

Water sources on the westside of the Upper Sacramento PR are abundant during non-drought years. However, on the eastside past the east slopes of Mt Shasta and into McCloud Flats and beyond, water sources become more and more scarce moving eastward. A few of the naturally occurring lakes and streams diminish in quantity and/or flow, often completely dry up in late summer early fall when wildfires are most likely to be problematic. There are a few scattered above-ground water tanks installed in this vicinity specifically placed to assist in wildfire suppression actions. Suppression resources are well aware of water source locations and are the best knowledge sources for changes or updates to water infrastructure.

- It is important that fire suppression personnel and community members are fully aware of water sources; communication with local FSC's and fire departments about the locations; ensure updated maps and be sure they are noted and kept current in their local level CWPPs.

- Communities not covered in local CWPP should be working directly with their area wildfire agency personnel to ensure all water sources are located and identified on a 'unit map' and updated regularly.

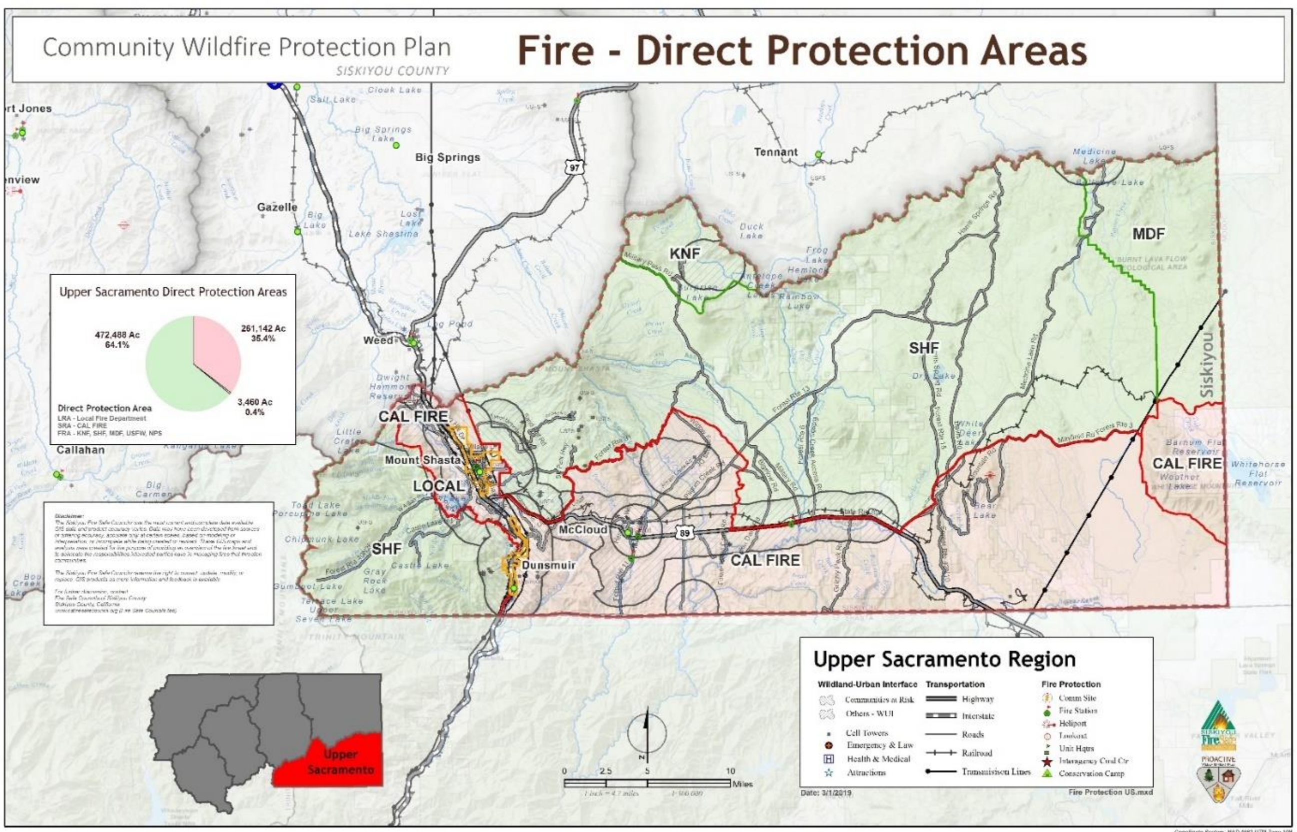
Descriptions and lists of activities & efforts by community citizens and groups to improve fire safety in their areas should be compiled by the local Fire Safe Councils.

- Active Fire Safe Councils (FSCs)
  - Dunsmuir FSC
  - Mount Shasta FSC
  - Hammond Ranch FSC
  - McCloud FSC

- See Pre-Fire Projects – as listed in CAL FIRE Siskiyou Unit (see *Appendix E*)

Wildfire Protection

Figure 7 - Fire Direct Protection Areas for Upper Sacramento PR



Wildland fire protection agencies/protection entities:

- USFS Shasta-Trinity NF: Shasta-McCloud Management Unit (SMMU) suppression resources include 2 Division Chiefs, 3 Battalion Chiefs (2-Suppression and 1-Fuels), 6 engines (type 3), 3-Fire Prevention Officers, 1-dozer, 1-water tender and multiple seasonal suppression resource employees.

- CAL FIRE resources consist of a 1-Battalion Chief, 4 engines (2 in McCloud, 2 in Pondosa)
- Community / volunteer fire departments: engines housed at each of the stations (Dunsmuir Fire Dept, Mount Shasta City Fire Dept, Mount Shasta Fire Protection District, McCloud Fire Department)
- **NOTE:** Equipment & typical staffing/personnel numbers will vary based on needs and funding *(refer to local CWPPs or call area representative wildfire protection agency for current/updated staffing information).*

- Primary concerns and challenges faced by protection forces:

#1 = Access-egress routes are amongst the highest priority safety elements in a wildfire emergency.

- Evacuation Route Mitigation Actions are a necessity for life safety of citizens and emergency personnel

Evacuation route assessment should include, but is not limited to:

- ✓ Roadbed width and adequate pullouts
- ✓ Roadside vegetation clearance
- ✓ Roadside power-pole and power line clearance
- ✓ Signing of existing residence(s) on side roads
- ✓ Clear marking of fire hydrant/water sources

IMPORTANT NOTE: Upper Sacramento PR leadership, citizens and interagency cooperators should expand on a list of challenges and mitigation actions in FSC level and/or local community level meetings. Larger scale maps can be reproduced to help identify primary evacuation routes for community awareness, education, and to incorporate priority fuels treatments into local CWPP Action plans.

Contact information for local fire protection services:

State Resources

- **CAL FIRE Station McCloud**:
  1509 Squaw Valley Rd, McCloud, CA 96057 | (530) 964-2150
  http://calfire.ca.gov/contacts/station?SID=748
- **CAL FIRE Station Pondosa (staffed in summer):**
  29599 HWY 89, P.O. Box 885, McCloud, CA 96057 | (530) 598-2631

Federal Resources

- **USFS Shasta-Trinity NF, Mount Shasta Ranger District Office:**
  204 W Alma St, Mt Shasta, CA 96067| (530) 926-4511
  https://www.fs.fed.us/organization/Shasta%20McCloud%20Management%20Unit%20%28Mount%20Shasta%20Ranger%20Station%29
- **USFS Shasta Trinity NF, McCloud Ranger District Office:**
  2019 Forest Road McCloud, CA 96057 | (530) 964-2184
  https://www.fs.fed.us/organization/Shasta%20McCloud%20Management%20Unit%20%28McCloud%20Ranger%20Station%29

Local Community & Volunteer Resources

- **Dunsmuir Fire Department:**
  5915 Dunsmuir Avenue, Dunsmuir, CA 96025 | (530) 235-2551
  http://www.ci.dunsmuir.ca.us/fire-department/
- **Mount Shasta City Fire Department:**
  305 N. Mt. Shasta Blvd Mount Shasta, CA 96067 | (530) 926-7546
  https://mtshastaca.gov/fire/
- **Mount Shasta Fire Protection District:**
  600 Michelle Dr. Mount Shasta, CA 96067 | (530) 096-0702
  https://usfireDepartmentcom/mount-shasta-fire-protection-district-15587.html
- **McCloud Fire Department:**
  319 Tucci Ave. McCloud, CA 96057 | (530) 964-2422
  https://www.firedepartment.net/directory/california/siskiyou-county/mccloud/mccloud-volunteer-fire-department

Evacuation

IMPORTANT EVACUATION INFORMATION:

Refer to Section 6.4 Evacuation for helpful pre-emergency tools, websites, and general procedures regarding area evacuations.

A map of primary roads identified for evacuation routes is an essential tool that should be developed at the local community level. The cartographic/GIS information for this road map information is provided on the FSCSC web site. Larger scale maps can be reproduced for use by community leadership and/or local FSCs. Local FSCs should make it a priority to identify main evacuation routes and prepare a local plan to reduce hazardous fuels along these routes so residents can evacuate safely and first responders/fire-fighting resources can safely access an area.

PART III. APPENDICES

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Appendix A. References

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Appendix B. Glossary

The following provides terms or words found in or relating to this plan. For additional terms an online resource is available at: http://www.nwcg.gov/glossary.

Aspect: Direction a slope faces.

Assessment: 1) A fire weather fire danger product based on a thorough evaluation of all pertinent sources of meteorological, fire danger and resource information. 2) The evaluation and interpretation of measurements, intelligence, and other information to provide a basis for decision-making.

Atmospheric Stability: According to the American Meteorological Society, (also called static stability), the ability of the atmosphere at rest to become turbulent or laminar (statically stable) due to the effects of buoyancy.

Canopy Spacing: The distance from the edge of one tree canopy to another. Crown spacing varies from open (with 10 feet or more of space between tree canopies) to closed (where trees may be growing in very close proximity with little space between them).

Crown Fire: A fire that advances from top to top of trees or shrubs more or less independent of a surface fire. Crown fires are sometimes classed as running or dependent to distinguish the degree of independence from the surface fire.

Dead Fuels: Fuels with no living tissue in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

Direct Attack: A method of fire suppression where actions are taken directly along the fire's edge. In a direct attack, burning fuel is treated directly, by wetting, smothering, or chemically quenching the fire or by physically separating burning from unburned fuel.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather, and topography.

Firebrand: Any source of heat, natural or human made, capable of igniting wildland fuels. Flaming or glowing fuel particles that can be carried naturally by wind, convection currents, or by gravity into unburned fuels.

Fire Frequency: Temporal fire occurrence described as a number of fires occurring within a defined area within a given time period.

Fire Intensity: A general term relating to the heat energy released by a fire.

Fire Potential: The likelihood of a wildland fire event measured in terms of anticipated occurrence of fire(s) and management's capability to respond. Fire potential is influenced by a sum of factors that includes fuel conditions (fuel dryness and/or other inputs), ignition triggers, significant weather triggers, and resource capability.

Fire Regime: The characterization of fire's role in a particular ecosystem, usually characteristic of particular vegetation and climatic regime, and typically a combination of fire return interval and fire intensity (i.e., high frequency, low intensity/low frequency, high intensity).

Fire Return Interval: The length of time between fires on a particular area of land

Fire Severity: Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time.

Fire Suppression: All work and activities connected with control and fire-extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.

Fire Weather: Weather conditions that influence fire ignition, behavior, and suppression.

Flame Length: The distance from the base to the tip of the flaming front. Flame length is directly correlated with fire intensity.

Flaming Front: The zone of a moving fire where combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front.

Foehn Wind: A warm, dry and strong general wind that flows down into the valleys when stable, high pressure air is forced across and then down the lee slopes of a mountain range. The descending air is warmed and dried due to adiabatic compression producing critical fire weather conditions. Locally called by various names such as Santa Ana winds, Devil winds, North winds, Mono winds, etc.

Fuel: Any combustible material, which includes but is not limited to living or dead vegetation, human-built structures, and chemicals that will ignite and burn.

Fuelbed: An array of fuels usually constructed with specific loading, depth, and particle size to meet experimental requirements; also, commonly used to describe the fuel composition.

Fuel Break: A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled.

Fuel Characteristics: Factors that make up fuels such as compactness, loading, horizontal continuity, vertical arrangement, chemical content, size and shape, and moisture content.

Fuel Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: Mathematical descriptions of fuel properties (e.g., fuel load and fuel depth) that are used as inputs to calculations of fire danger indices and fire behavior potential.

Fuel Moisture Content: The quantity of moisture in fuels expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Fuel Reduction: Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Front: In meteorology, the boundary between two air masses of differing atmospheric properties.

Goals: A goal is a broad statement of what you wish to accomplish, an indication of program intentions.

Ground Fire: Fire that consumes the organic material beneath the surface litter ground, such as a peat fire.

Intensity: The level of heat radiated from the active flaming front of a fire, measured in British thermal units (BTUs) per foot.

Ladder Fuels: Fuels that provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. Ladder fuels help initiate and ensure the continuation of crowning.

Live Fuels: Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms, rather than by external weather influences.

Mid-flame Windspeed: The speed of the wind measured at the midpoint of the flames, considered to be most representative of the speed of the wind that is affecting fire behavior.

Mitigation: Modifying the environment or human behavior to reduce potential adverse impacts of from a natural hazard.

Objectives: They contribute to the fulfillment of specified goals and are measurable, defined, and specific.

Passive Crown Fire: Also called torching or candling. A fire in the crowns of trees in which single trees or groups of trees torch, ignited by the passing front of the fire.

Pressure Gradient: The difference in atmospheric pressure between two points on a weather map. Wind speed is directly related to pressure gradient. If distance between constant pressure lines is reduced by one-half, wind speed will be doubled.

Prescribed Fire: Any fire intentionally ignited by management actions in accordance with applicable laws, policies, and regulations to meet specific objectives.

Safety Zone: A preplanned area of sufficient size and suitable location in the wildland expected to prevent injury to fire personnel without using fire shelters.

Red Flag Warning: Term used by fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern.

Riparian: Situated or taking place along or near the bank of a watercourse.

Slash: Debris resulting from such natural events as wind, fire, or snow breakage; or such human activities as road construction, logging, pruning, thinning, or brush cutting.

Spotting: Refers to the behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Strategy: The general plan or direction selected to accomplish incident objectives.

Surface Fire: Fire that burns loose debris on the surface, which includes dead branches, leaves, and low vegetation.

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

Temporary Refuge Area (TRA): A preplanned area where firefighters can immediately take refuge for temporary shelter and short-term relief without using a fire shelter in the event that emergency egress to an established Safety Zone is compromised. Examples: lee side of structure, inside of structure, large lawn or parking area, cab of apparatus. (Firescope, 2013)

Topography: Referred to as "terrain." The term also refers to parameters of the "lay of the land" that influence fire behavior and spread. Key elements are slope (in percent), aspect (the direction a slope faces), elevation, and specific terrain features such as canyons, saddles, "chimneys," and chutes.

Understory: Term for the area of a forest which grows at the lowest height level below the forest canopy. Plants in the understory consist of a mixture of seedlings and saplings of canopy trees together with understory shrubs and herbs.

Values at Risk: People, property, ecological elements, and other human and other intrinsic values within the City. Values at Risk are identified by stakeholders as important to the way of life in the City, and are particularly susceptible to damage from undesirable fire outcomes.

Vertical Fuel Arrangement: Fuels above ground and their vertical continuity, which influences fire reaching various levels or vegetation strata.

Wildland Fire Environment: The surrounding conditions, influences, and modifying forces of fuels, topography, and weather that determine wildfire behavior.

Wildland Urban Interface (WUI): The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Describes an area within or adjacent to private and public property where mitigation actions can prevent damage or loss from wildfire.

Fire Modeling

California Department of Forestry and Fire Suppression (CAL FIRE) has an assessment group called the Fire and Resource Assessment Program (FRAP). It was determined to use readily available data as local Fire Safe Councils have varying degrees of capacity in obtaining reliable data. There are myriad data available on their data page (frap.fire.ca.gov/data/frapgismaps-subset). There are downloadable datasets for use in GIS software as well as already developed PDF products on the FRAP page. Local Fire Safe Councils are encouraged to use these data. Data sets used for this CWPP include:

- **Fire Threat**
  Statewide map of wildland Fire Threat data developed for the National Fire Plan(v05_1)
- **Fuel Rank**
  Statewide map of Detailed Fuel Rank Data (30 Meter) developed for the California Fire Plan (v05_2)
- **Fire Hazard Severity Zones**
  State and County Maps of Fire Hazard Severity Zones
- **Fire Perimeters**
  Statewide map of fire history, generally 300-acre minimum for CDF fires and 10-acre minimum for USFS fires since 1950, but many smaller fires as well. (v17_1)
- **Communities at Risk From Wildfire**
  Statewide map of Communities at Risk from wildfire (points), based on list submitted for the National Fire Plan.
- **Surface Fuels**
  Statewide map of Detailed Surface Fuels Data developed for the California Fire Plan (v05_1).

This CWPP used Fuel Rank, Fire Threat, and Fire Hazard Severity data for the analysis of potential wildfire within the County. These data are explained in *Section 5* of this document.

Wildland Urban Interface

This CWPP used a synthesized Wildland Urban Interface (WUI) protocol. Two data sets one from the US Forest Service and another from CAL FIRE were superimposed using GIS technology. These two data sets were incorporated into one dataset for the purposes of this analysis. Communities are encouraged to develop their own WUI boundaries based on more specific data and the needs and infrastructure of the community. Both of these WUIs datasets use the Healthy Forest Restoration Act 1½ mile buffer around all known structures. Some local Fire Safe Councils have developed their own WUI boundaries as is permitted. Many have not. To avoid bias, all Communities at Risk (CAR) and other known WUI areas were mapped out utilizing a common approach while using the 1 ½ mile buffer protocol. Also, there is no single source of WUI data in a GIS format that was available in Siskiyou County for this CWPP hence the need to construct the WUI layer.

Fuel Modeling

Two primary sources for vegetation and fuel modeling were used: the vegetation information from FRAP and the LandFire (https://www.landfire.gov/) data for the Vegetation and Fuel Maps used in the document. Landfire (Landscape Fire and Resource Management Planning Tools) fuel model maps were used for creating the vegetation/fuel type maps found in the document.

General Information: Fuel Models/Fuel Types

There were originally 13 fire behavior predictive system fuel models used for the calculation and application of fire behavior and other fire management related requirements. The original 13 fire behavior fuel models were developed "for the severe period of the fire season when wildfires pose greater control problems..." (Anderson 1982). Those fuel models worked well for predicting spread rate and intensity of active fires at the peak of fire season in part because the associated dry conditions lead to a more uniform fuel complex; an important assumption of the underlying fire spread model (Rothermel 1972). However, they have deficiencies for other purposes, including prescribed fire, wildland fire use, simulating the effects of fuel treatments on potential fire behavior, and simulating transition to crown fire using crown fire initiation models.

Scott, et al. (2005) added to the depth of fire behavior prediction capability by adding an additional 40 fuel models to the 13 that the fire behavior Predictive System already had. There is greater definition to fuels in timber types as well as enhanced classification in grass and brush.

Characteristics

This new set of standard fire behavior fuel models is designed to stand alone; none of the original 13 fire behavior fuel models is repeated in the new set; the fuel model selection guide points to the new fuel models only. However, the original 13 fire behavior fuel models are still available, and they are still called fire behavior fuel models 1-13. Documentation and naming of the new fuel models refer to fuel or fuel types, not vegetation or vegetation types. For example, what was formerly termed a "Chaparral" fuel model might now be called a "Heavy Load, Tall Brush" model because one fuel model can be applied in many vegetation types. Likewise, the fuel model selection guide does not refer to specific vegetation types except as necessary to illustrate an example.

Naming Convention

Fuel models in the new set are grouped by fire-carrying fuel type. The number of fuel models within each fuel type varies. Each fuel type has been assigned a mnemonic two letter code. Non-burnable fuel models, even though not really a "fuel," were included in the set to facilitate consistent mapping of these areas on a fuel model map. Fuel types were ordered in a way similar to the original 13, with hybrid fuel types (such as Timber-Understory) generally between the two types that compose the hybrid. Fuel types are as follows:

1. (NB) Non-burnable
2. (GR) Grass
3. (GS) Grass-Shrub
4. (SH) Shrub
5. (TU) Timber-Understory
6. (TL) Timber Litter
7. (SB) Slash-Blowdown

Data Availability

- The raw data are all available by accessing the CAL FIRE FRAP or the LandFire pages directly.
- Data products and outputs for this CWPP are or will be available on the Fire Safe Council of Siskiyou Country webpage: https://firesafesiskiyou.com/.

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Appendix D. Public Workshop Participant Input

Workshop Participation Input

In May of 2017 an interagency meeting was held to introduce the collaborative CWPP process to the various fire and resource agencies, County leadership representatives and Fire Safe Council groups. Dates were scheduled for five public workshop meetings to take place over the course of the next four months throughout the County, as shown here:

1. July 19, 2017 College of the Siskiyous, Weed CA
2. July 24, 2017 Seiad Valley Fire Department Hall, Klamath River, CA
3. August 15, 2017 Klamath National Forest Headquarters, Yreka, CA
4. September 12, 2017 Klamath National Forest, Goosenest Office, Macdoel, CA
5. September 28, 2017 Resource and Events Center, Fort Jones, CA

This series of public meeting/workshops is an integral part of the collaboration element in a CWPP development process. Each community and every individual is encouraged to voice ideas and concerns that will help in drafting a community based product to better prepare for wildfire.

Outreach and notifications prior to meetings and workshops consisted of media releases via local newspapers, radio stations, flyers and various e-mail invitations.

The workshops each began with an informative power-point presentation that explained the purpose, objectives and functions of this CWPP update project, followed by a time period for questions and discussions. The participants then had the opportunity to break out to various stations/display tables that addressed specific factors for: Wildland Urban interface (WUI), wildfire hazard severity, area wildfire history and defensible space information.

The following tables identify participant input for each of the meetings:

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First Workshop | South County | Weed CA | July 17, 2017	
Question / Comment	**Response**
1) A request for further explanation of the benefits of a countywide CWPP and the importance to communities, in addition to the science-based assessment and mitigation actions.	Emphasize on additional benefits: supporting communities not covered in a local CWPP and providing updated information/policy references to communities with CWPPs.
2) Boles Fire discussion regarding fuel treatment needs and questions about fuelbreak effectiveness.	Stressed the importance of safe access-egress routes and the significance of the fuelbreak work done along these routes which were critical to fire suppression forces in suppression operations.
3) Will this plan will prioritize projects in one community over another.	Clarified that this is not the case. Each individual community can/should do their prioritization in their local planning. This CWPP's updated information and fire assessment tools can assist in local community project prioritization tasks.
4) Specific to the remote community of Bray, what is recommended addressing the lack of access to communication, causing difficulty in relaying fire information and/or dispersing educational materials.	Response by CAL FIRE rep: They should make contact with the closest fire station, MacDoel, CAL FIRE station. Also suggested to work with the local P.O. for support in delivering educational flyers.
5) Regarding SRA and LRA areas, a question and discussion evolved about the different ratings for these areas pertain to the 4291 Defensible Space policy.	Response by CAL FIRE rep: There are different outcomes for these different responsibility areas, in terms of building code regulations and also affect homeowners insurance. This will be clarified in the CWPP and information can be found on the CAL FIRE website.
6) A question was posed about a relatively new grant issue: SRA hazard fuel treatment grant funding has now specified strict guidance stating it can apply only to SRA lands. This is complicated for communities where city boundaries are in designated LRA but many areas just outside the boundary are either in or directly adjacent to SRA.	Response by CAL FIRE rep: To acquire funds to treat hazard fuels w/in LRA – refer to a 'Hazard Mitigation Plan' (HMP) –most individual cities should have an HMP which is where to look first. There is a county HMP, which would be the next level to research, if information cannot be obtained at city level.
Second Workshop | Northwest County | Seiad Valley | July 24, 2017	
7) Some FSC's have not been 'active' for a long time due to lack of funds for on-the-ground work. How will this plan and lack of current communications with FSCSC affect these communities? If grant funds become available to the County how will these 'inactive' FSCs be accounted for in the process?	These 'inactive' FSCs have never been deleted, they are in the system. This countywide CWPP is beneficial as it covers and supports all communities in the County. The project prioritization is science based and correlated to wildfire hazard-risk levels in WUI areas. Suggestion: Start with contacting nearby active FSC rep or work

	through the closest fire department.
8) Once this plan is in place, where will the grant money go? There is concern that this county level plan creates an added money filter and admin costs versus money to the ground.	The Countywide plan has been in place since 2008; this is an update with updated information and a science-based foundation. The intent is to bring in more funds to all communities to proactively implement much-needed wildfire hazard reduction. Not to fund an organization.
9) How will all the communities apply for grant funds in a fair/equal manner?	This topic will be discussed with the FSCSC board and reps from state and federal levels to ensure a fair and systematic method that is transparent.
10) There are outlying rural areas that feel the FSCSC does not support local FSC's as they could and should be helping them. Is this countywide FSC likely to take potential grant funds from existing FSCs to allocate to the non-FSC groups that are/will be covered in county FSC.	A plan does not create division of resources. An issue of non-support should be communicated directly through meetings amongst FSC reps at all levels. The Countywide CWPP supports all FSCs and all communities; it is a reference to be utilized by all groups in Siskiyou County and should be used collaboratively. Community or FSC reps should attend CAL FIRE's grant application training to prepare and succeed in acquiring funding.
11) Grant RFP text clearly asks 'what is the priority in your CWPP'. How will that work for the communities under the Countywide CWPP vs. the priority in the communities that have their individual CWPP – and how will the 'prioritization' work in those different entities?	When addressing project prioritization; this is best done collaboratively at the community level and captured in a local plan. This CWPP gives guidance to help in that process and provides new tools, maps with wildfire science. There is no advantage of one level plan prioritization system over another. Funding prioritization should consider several factors including wildfire hazard, risk, WUI proximity issues.
12) Is there any way for grant funds to address road issues throughout areas of the County? Road conditions are a critical factor for access to do projects and for ingress-egress in emergency situations.	Roads and more specifically, primary evacuation routes should be amongst the highest priority in every community; this CWPP clearly states that fact. There definitely are grant funding resources that address roadside hazard reduction. Contact Community rep, FSC rep or CAL FIRE rep and seek out CAL FIRE grant training.
13) Possibly consider conducting an annual coordination meeting between FSCSC, CAL FIRE and (possibly) Siskiyou County Board or Dept rep. – for looking at project prioritization process in relation to potential grant funding opportunities.	This discussion is related to Comment #3; it is an important topic. As suggested, a meeting by reps from various FSCs, Community and/or County reps and fire protection entities should be coordinated with respect to prioritization processes
14) The mission statements of all the entities involved (USFS, CAL FIRE, Fire Chief Association, County Board) are all different and can be part of the	This is true, but <u>they ALL have a common goal:</u> support protection of: life safety, values and resources in a wildfire environment.

difficulty in the 'coordination' when it comes to grants and priorities.	
15) The lack of prevention programs across communities and county – is a BIG problem. The rural FD's are (in many cases) so stretched and small – they only attend to the fire and medical calls and have no support or funding for fire prevention or education programs.	Education and prevention programs are a very important tools for wildfire awareness at all levels of communities and beyond the scope of undertaking for local volunteer FDs. Communities should work with their agency fire protection workforce and grant resources.
16) A suggestion that we hold these meetings later in the rural areas. Often the incumbent citizens work situation requires having to commute long distances and 5:00 pm was not optimal timing.	The final public review meeting will be held in Yreka at 6:30 to better accommodate work schedules
17) The fuel treatment project 'Success Stories' need to get out there better – specifically mentioned the Goff fire in the Seiad Valley area (a FB project was the reason the Goff wildfire was contained before serious potential damage)	This is an excellent point. Suggest communicating with FSCSC; they do have a new website and can post success stories that can be viewed countywide. Project pictures and records should be part of the community fuels treatment monitoring program which can be beneficial for out-year grant application process.
Third Workshop | Central County | Klamath NF Headquarters | August 15, 2017	
Question/Comment	**Response**
18) Is the County Hazard Mitigation Plan (HMP) a viable source of funding in the Local Responsibility Areas (LRA) of the County now that State Responsibility Areas (SRA) policy, states SRA funds are only to be used on SRA lands?	County OES response: The statewide hazard mitigation funding is quite limited. The plan had expired as he stepped into the position, he was working to have it in place by estimated early 2019
19) Question addressing Hornbrook area's need of a fire station, and whether that may be funded in near future.	CAL FIRE Chief response: Explained that it is a fire protection district therefore funding rules/sources different than SRA area. Locally, CAL FIRE clearly supports them on the importance/need for a station in Hornbrook. He mentioned that they should be looking at many sources for potential/applicable grant funds, state and local. Also noted: Hornbrook is a Community At Risk and he encourages citizens to engage with their closest (Hornbrook) station with questions and for fire prevention/protection information.
20) Question/discussion regarding KRCE (Klamath River County Estates); considered a 'gap' area where it is not a fire protection district.	CAL FIRE Chief response: Encouraged the community members to engage with their closest (Hornbrook) station with questions and fire prevention/protection information etc. Also noted: Countywide CWPP would benefit these type areas (KRCE and Hornbrook)

	by helping them obtain current information/resources on funding sources as well as be able to reference current wildland fire policy and regulations that affect their communities.
21) KRCE community members brought up questions relating marijuana grows as a big problem that continues to expand. Use of dead brush a 'fence' or screening around the grows within 100' defensible space zone poses a serious wildfire risk.	CAL FIRE Chief response: This is problematic throughout the County. He explained that their (CAL FIRE) Law Enforcement reps are aware and working on these type issues in many areas. He explained that the best course of action is to call their Headquarters Office (842-3516) and ask for Greg Roath. They are tackling many of these as a violation of defensible space policy.
22) Request to consider another word for 'stakeholder' due to past issues and group projects, where it was in a sense divisive of agency vs. citizens.	Request will be taken into account. An alternative word choice of 'participant' will be an option. Desire term to be all-encompassing for agencies and citizens.
Fourth Workshop | Northeast County | Goosenest District Office, KNF | September 17, 2017	
23) Who is the best contact to coordinate with on educational wildfire prevention, including flyers specifically for bi-lingual population?	A CAL FIRE representative present at the meeting stated they would help out with the task.
24) Who to contact regarding hazard fuel problem (including trees) within a 100' defensible space zone along RR corridor?	Advice was to contact the RR representative. If unsure who to contact, CAL FIRE or USFS contact can help locate the correct representative.
25) What is the best way to approach a hazard fuel issue on adjacent neighbor property?	Initially it is best to try and contact the neighbor/property owner and talk to them about your concerns. If that is ineffective, contact a local CAL FIRE representative.
26) Discussion about California Codes, Regulations (CCRs) that address structures in WUI and defensible space, fire-fighter safety.	CAL FIRE representative reinforced the importance of residents doing their part in clearance and structure protection – PREFIRE. He emphasized that suppression forces cannot be expected to protect a home that has not been properly cleared; they will not put their own lives in jeopardy.
27) The problem of 'open space' was brought up. This is a countywide issue and a BIG problem.	The agencies are well aware of the issue. Notification of the land/property is the first step. Citizens can work with CAL FIRE and/or County Planning Department/Registrar – to research/locate proper contact address information and begin by sending a notice/letter.

Fifth Workshop | Central-West County | Scott Valley Resource Center | September, 28, 2017	
Question/Comment	**Response**
28) Concern was expressed about the role of the various FSCs the County Gov't board in relation to how the 'ownership' of this CWPP functions.	This CWPP document is a plan for the entire geographical area of Siskiyou County; it has an important purpose and clear functions that pertain to all communities and citizens of the County. It will become public domain. Wildfire resilience implementation actions can best move forward when a working relationship is established amongst various leaderships and boards. This CWPP is a living document and a community driven tool.
29) For project work on private lands, it was pointed out that there is confusion regarding the use of funds and what funds can be used.	Agency reps can help on advising the funding aspect. The importance is who it protects regardless what entity comprised the project. Added note: federal funds cannot be used on lands with marijuana grows.
30) What is the role of the power companies in this CWPP process	They have been included in the initial announcement. They do have some important 'right-of-way' corridors and adjacent lands issues. They will be included in the review and be part of a proactive approach
31) Will the County would adopt this CWPP?	Apparently adopting it as a 'stand-alone' plan may not be the feasible step due to other 'domino' effects in terms of county planning documents. In discussion the thought was expressed that perhaps at some point it may be incorporated as an Appendix to county planning documentation.
CWPP Final Draft Review Meeting | CALFIRE Siskiyou Unit Headquarters | March 13, 2019	
Question/Comment	**Response**
1) [a] Where to find leadership to move forward with implementation? [b] where to get funding? [c] how to get community citizens to care and take actions?	[a] Suggestion to reach out to knowledgeable individuals/leaders to help 'kick-start' actions. Consider contacting local FSC or FSCSC or local Fire Department (FD), CAL FIRE and/or USFS representative to help identify these leaders. [b] Section 7 of this CWPP lists some funding options at local, state and federal levels; seek help through local FSC, FSCSC or CAL FIRE. [c] NOW is the time to rally citizens; the disastrous, deadly 2017-18 wildfire seasons have solidified the dire need to take action.

2) What is meant when the term ‘project’, is that actions at home or in an area?	The term is utilized for both home and an area with in a WUI. It is Joining forces with multiple homesites in a neighborhood can be more effective in acquiring funding and increasing the level of treatment.
3) [a] Why didn’t the CWPP Planning Region boundaries follow the CAL FIRE Siskiyou Unit Plan Battalion boundaries? [b] With areas so universally ‘red’ how do you interpret this to help prioritize hazard reduction projects?	[a] The boundaries were carried forth from previous (2008) version CWPP. CAL FIRE’s battalion delineation covers only SRA lands, whereas this delineation covers the entire land base, [b] This assessment is a broad-scale tool. It can and should be rescaled for use at the project level. FSC and agency reps can help in locally based interpretations.
4) Comment that CAL TRANS needs to address clearance actions along Interstate Highway 5 (I-5) in Dunsmuir.	The Delta fire (2018) along I-5 was a big ‘wake-up call’ for CAL TRANS, suppression crews and citizens. Extensive clearance zones now in place are part of a current strategy that is being planned northward into Siskiyou County.
5) Concerns about repercussions of significant water reduction in upper reaches of the Klamath River due to dam removal project.	This concern has been brought forward by wildfire suppression agency managers as well. Actions to address this decision are outside the scope of a CWPP document.
6) Comment suggestion more pre-fire season dozer work, more aircraft and alternative use of fire lookout facilities.	Dozer use on projects is a case by case alternative for treatment and must follow standard NEPA/CEQA guidelines. Aircraft contract agreements are managed by agency managers and outside the scope of a CWPP document. Lookout facilities are managed by agencies; suggestions can be brought forth to state/federal representatives.
7) How are communities addressing the current ‘green waste’ issue? Many people are treating the fuel and burning is not necessarily an alternative for disposal.	A chipper is an alternative that may be limited in availability; suggest a neighborhood effort to gain group and agency support. There is an effort underway to set up disposal at transfer station facility, more information should be out soon.
8) Question about the $115.00 SRA fire protection fees	This fee was suspended in July of 2017. The funds are in an account that is being utilized for active fuels reduction work across the state and for service district fees and recruiting more local FD personnel.
9) Is there enforcement of the PRC 4291 Defensible Space 100’ policy code?	YES. In the SRA they do require compliance; inspections are conducted and warnings are initially issued for non-compliance situations, followed by citation/fines if not corrected in allotted timeframe. Inspections are prioritized and revisited every 3 years.

10) Advice on moving forward with actions via a newly initiated program in Happy Camp vicinity.	Work with FSCSC and/or local FSC reps and engage the local FD as well as CA FIRE and USFS for advice on wildfire education & projects. Noted: This CWPP encompasses all communities in the County; it includes potential fiscal sponsorship for those that may not be covered in a local CWPP.
11) On maps: [a] suggestion to 'unify' state and federal areas, [b] provide better coverage of 'border areas' between SRA-FRA	The map information follows the data in the state's Fire Resource Assessment Program (FRAP); whereby SRA and FRA are delineated due to designated agency responsibilities as directed in agreements. Feedback on 'border' issues will be reviewed and feedback forwarded to a FRAP representative as deemed appropriate.
12) Vegetation on evacuation routes is a HUGE problem; why isn't it addressed/enforced as a countywide policy?	This CWPP clearly emphasizes the fact that evacuation routes need to be every community's top priority (Section 6 Action Plan, and each Planning Region). County is working on the issue in updated HMP. At state level, PRC 4290 regulates road width as part of defensible space factors; currently this law does not apply to properties/roads established before 1991, unless owner has new building permit.
13) On maps: Ag/irrigated lands (i.e. Shasta Valley PR) do not appear to be modeled correctly.	Reminder that this modeling at the State level is a coarse scale. This level can and should be scaled down for more precise modeling at project or local CWPP level. Feedback should be communicated to a FRAP representative.
14) Remark about the reality of high wind situations that occurred in 2017-18 wildfires and in 2014 Boles fire in Weed and actions in those situations.	The weather and specifically winds are extremely important in wildfire spread. This plan reinforces the fact that every person is responsible to educate themselves and families, do their home preparation and be prepared to evacuate. Agencies are responsible to uphold codes and policies to assist in preparedness actions and facilitate safety in evacuations. Nobody should ever wait and count on suppression resources to save themselves or their home in a wildfire event.
Final Draft Review Electronic Mail Comment - April 04, 2019 ***Includes comments with subject matter not covered in Final 03/13/19 Final Review meeting**	
Question/Comment	**Response**
1) Statement that prescribed (Rx) fire is the only answer; emphasized the need to bring back 'good fire' and refers to the Kuruk Tribe and Mid-Klamath	There is not a 'one-size-fits-all' answer to fuel reduction treatments. Prescribed fire is an important tool that takes trained and experienced

Watershed Council. Suggest using mechanical thin and Rx fire around towns.	practitioners to safely and properly implement. Using a combination of 'tools in the tool-box' generally works to meet project objectives. Learning and, when appropriate, applying actions utilized by experienced surrounding groups (i.e.; tribal and/or resource entities) can be a helpful step in local project implementation.
2) Why isn't the SSD (Safe Separation Distance) tool, described in Section 6.2.1 Life Safety, utilized in more applications for defensible space purposes.	Currently, this concept is for guidance as an educational tool that can help people understand the wildfire separation distances involved for safety and survival. It can be helpful for homeowner awareness and for understanding of survivable locations on a landscape.
3) Concern that the Fuel Treatment Unit (FTU) prescriptive process and percentage delineation by percentages of the fire severity rating categories is too broad brush and is not adequate for prioritizing potential grant funds.	This is a tool that uses fire science. It is only One factor in the decision process for prioritization. Elements such as proximity to homes/values and life safety are always highest priority. The emphasis in a CWPP is the need to work from the structures outward. Local CWPP Action Plans can utilize this science of fire in combination with local knowledge and safety strategy to better address their needs.
4) Concern that there needs to be more specificity in ingress-egress/ evacuation route information.	This is definitely an important element. As is stated in the CWPP, this element is best addressed at the local community levels and needs to be captured in local CWPP's. A wildfire emergency is unpredictable and evacuation planning needs to reflect all possibilities, unique to each setting. Local community emergency resources are the best source for specific evacuation planning and operations.
5) Remarks describing the opinion that the Action Plan prescriptions for roadside fuel breaks and FTUs are not adequate in size/scope; states that treatments need to be much more extensive (going out 2 miles from communities).	The Rx table information is part of Action planning guidance and addresses minimum requirements per defensible space public resource codes provided in state policy. More treatment is encouraged where actions are within legal parameters and financially feasible. The idea is to work outward starting with individual structures, neighborhoods and communities. Future planning efforts may allow for expansion of this concept further into the WUI. An existing model/prototype for expansion has been captured in Appendix G and may be a starting point for consideration in future collaborative community and interagency fire safe planning.

Appendix E. Pre-fire Projects (CAL FIRE Siskiyou Unit)

(Last Update: May 2018)

[**Project Status Guide:** A: Active, P: Planning, C: Completed, O: Ongoing, M: Maintenance, NC: Not Complete]

Batt	Project Number	Project Name	Status	Estimated Completion Year	Project Type	Net Acres
I	04-DG-11050555	Scott River Road Shaded Fuel Break	C	2004	Fuel Modification	70
I	06-USFS-8908	Lower Scott River Access Roads SFB	NC	2006	Fuel Modification	100
I	06-DG-11050555-021	West Community Shaded Fuel Break	M	2006	Fuel Modification	69
I	06-DG-11050555-022	Sniktaw Road Shaded Fuel Break	C	2006	Fuel Modification	40
I	07UFS9552	Lower Scott River Access Road II	NC	2007	Fuel Modification	50
I	07-DG-11050500-017	French Creek Fuel Break Segment 1	C	2008	Fuel Modification	44
I	07-DG-11050500-025	Tyler Gulch Road Shaded Fuel Break	C	2008	Fuel Modification	57
I	07-DG-11050500-023	Rattlesnake Creek Road Shaded Fuel Break	C	2008	Fuel Modification	52
I	07-DG-11050500-022	Old English Road Shaded Fuel Break	C	2009	Fuel Modification	51
I	08USFS0109	Elderly & Disabled Landowner Defensible Space	C	2008	Fuel Modification	60
I	09USFS-X-0075 (1417)	Dangle Lane Shaded Fuel Break	C	2010	Fuel Modification	70
I	09USFS-SFA0090 (930)	French Creek Shaded Fuel Break Seg. B, C & E	C	2010	Fuel Modification	86
I	09BLM0113 (1388)	Four Corners Community Safety Fuel Break Phases 3-4-5	C	2010	Fuel Modification	96
I	09BLM-0093 (931)	Four Corners Community Safety Fuel Break Phase 6	C	2010	Fuel Modification	151
I	09USFS-0096 (1519)	Lower Scott River Escape Route	C	2011	Fuel Modification	170
I	09USFS-X-0095 (1518)	Scott River Watershed Elderly & Disabled	C	2011	Fuel Modification	60
I	09UFS-0099 (1521)	Lower Scott River Ridgetop Fuel Break	C	2011	Fuel Modification	170
I	09UFS-0100 (1522)	Lower Scott River Road Fuel Break Maintenance	C	2011	Fuel Modification	70
I	10USFS-ES0333	French Creek Road Shaded Fuel Break	NC	2012	Fuel Modification	
I	10USFS-ES0329	Big Meadows Recreation Area Hazardous Fuels Reduction	NC	2012	Fuel Modification	255
I	10USFS-ES0336	Western Scott Valley Shaded FuelBreak	NC	2012	Fuel Modification	270
I	10-DG-11050500-014	Scott Valley Multiple Municipality Wildland Fire Protection Project	A	2012	Fuel Modification	120
I	11USFS-SFA-X-0038	Old High CCC Road Shaded Fuel Break	NC	2012	Fuel Modification	177
I	11USFS-SFA0072	Scott River Watershed CWPP Completion	C	2012	Planning	
I	06-DG-11050555-021	West Community Shaded Fuel Break	C	2006	Fuel Modification	69
I	07-DG-11050500-017	French Creek Fuel Break Segment 1	C	2008	Fuel Modification	44

[**Project Status Guide:** A: Active, P: Planning, C: Completed, O: Ongoing, M: Maintenance, NC: Not Complete]

Batt	Project Number	Project Name	Status	Estimated Completion Year	Project Type	Net Acres
I	07-DG-11050500-025	Tyler Gulch Road Shaded Fuel Break	C	2008	Fuel Modification	57
	07-DG-11050500-023	Rattlesnake Creek Road Shaded Fuel Break	C	2008	Fuel Modification	52
I		Etna Fuel Break	C	2000	Fuel Modification	60
I	11-DG-11051000-017	Western Siskiyou Sustainable Fuel Break	A	2013	Fuel Modification	59
I	10CA-11051000-027	Orleans Private Property Fuels Treatment Project	A	2013	Fuel Modification	203
I	11-DG-11050500-027	Shackleford Falls Recreation Area Fuels Reduction	C	2013	Fuel Modification	
I	12-DG-11050500-018	Emergency Water Development for Callahan	C	2013	Water Development	N/A
I	GT-151-SKU-003	Soap Creek Fuel Break Maintenance	C	2013	Fuel Modification	42
I		Soap Creek Ridge South Shaded Fuel Break	P	2014	Fuel Modification	24
		Soap Creek Ridge North Fuel Break	A	2018	Fuel Modification	43
II	09-DG-11050500-064	Yreka Area FSC Elderly & Disabled Def. Space	C	2012	Fuel Modification	30
II	11USFS-SFA0073	Yreka Area FSC CWPP Development	C	2012	Planning	
II	11USFS-SFA-X-0086	Yreka Area Defensible Space Fuels Reduction Project	C	2012	Fuel Modification	124
II	11USFS_SFA-X-0100	Yreka Area Critical Ingress/Egress Shaded Fuel Break	C	2012	Fuel Modification	150
II	09UFS0159	FSCSC Fuel Reduction 2009	C	2011	Fuel Modification	50
II	12USFS-SFA216	R Ranch Shaded Fuel Break Project	C	2013	Fuel Modification	30
II	10-DG-11050500-014	Seiad Water Source Development	C	2013	Water Development	N/A
II	03USF-0123	Black Mountain, Phase II	C	2015	Fuel Modification	50
II	14USFS-SFA-0075	Black Mountain, Phase III	A		Fuel Modification	50
II		White Rock Shooting Range	P	2015	Fuel Modification	26
II	13USFS-SFA-0122	Klamath River Phase II	C	2015	Fuel Modification	40
II		Siskiyou Golden Fair	O		Public Outreach	
III	07-DG-11050500-028	Juniper Flat FSC Chipper Days	C	2008	Fuel Modification	
III	09USFS0102 (935)	Juniper Flat Hazardous Fuel Reduction	C	2010	Fuel Modification	50
III	10USFS-ES0465	Hammond Ranch Community Hazardous Fuel Reduction	C	2012	Fuel Modification	50
III	10UFS-0653	Juniper Flat FSC Hazardous Fuels Reduction, Phase 2	C	2012	Fuel Modification	100
III	10UFS-0650	4th Annual Juniper Flat Free Chipper Days	C	2010	Fuel Modification	
III	11USFS-SFA-X-0042	Juniper Flat Defensible Perimeter Fuel	C	2012		100

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Batt	Project Number	Project Name	Status	Estimated Completion Year	Project Type	Net Acres
		Break, Phase I				
III	11USFS-SFA-X-0120	Hammond Ranch Community Hazardous Fuels Reduction Project, Phase 2	C	2012	Fuel Modification	90
III	10USFSES314	Weed City Fuel Break	C	2011	Fuel Modification	50
III		College of the Siskiyous	C		Fuel Modification	200
III		Shastina Drive-S. Weed Blvd	C	2011	Fuel Modification	50
III		Cal Trans	C	2011	Fuel Modification	
III		Columbus	C	2011	Fuel Modification	3
III		Old Edgewood Road	M	2009	Fuel Modification	12
III	RAC2010	Hammond Ranch Water Storage	C ~~P~~	2017	Water Tanks	
III	RAC2010	Pleasant Valley Water Storage	C	2015	Water Tanks	
III	RAC2011	Pleasant Valley Senior Fuel Reduction Project	C	2013	Fuel Modification	25
III	RAC2012	Siskiyou Fire Warden Brush Chipper	C	2012	Equipment	
III	Rx 2-023 SKU	East Weed Fuel Break	C	2005	Fuel Modification	12
III		Tulelake Fair	O		Public Outreach	
III		Juniper Flat Escape Route Chipper Days	C	2013	Fuel Modification	
III	13USFS-SFA-0123	South Weed Fuel Break (Weed City Fuel Break V)	C	2014	Fuel Modification	40
III		Observatory Hill Fuels Reduction	C	2014	Fuel Modification	60
III		East Weed Fuel Break Phase III Maintenance	A	2014	Fuel Modification	51
III		Rancho Hills	A	2014	Fuel Modification	14
III		Shasta O Ranch VMP	A	2014	VMP	496
III	12-DG-11050500-011	Pleasant Valley Senior Project	C	2014	Fuel Modification	25
III	13USFS-SFA-0123	West Weed Fuel Reduction	C	2015	Fuel Modification	26.8
III	15-CA-110505000-018	Tennant Fuel Reduction Phase I	A		Fuel Modification	100
III		Tennant Fuel Reduction Phase II	A			86
III		Tennant Fuel Reduction Phase III	P			65
III	14USFS-SFA-X-0074	Butte Valley Fuel Reduction	A		Fuel Modification	50
IV	10USFS0379	Lake Siskiyou Phase V	C	2012	Fuel Modification	40
IV	09-D6-11052912151-SKU-002	Azalea	C	2013	Fuel Modification	40
IV	10USFS-ES0382	Rainbow Ridge Fuelbreak Phase I	C	2012	Fuel Modification	44

[**Project Status Guide:** A: Active, P: Planning, C: Completed, O: Ongoing, M: Maintenance, NC: Not Complete]

Batt	Project Number	Project Name	Status	Estimated Completion Year	Project Type	Net Acres
IV		Bascom Wood	C	2011	Fuel Modification	240
IV	10USFS SFA 0504	Dunsmuir Fuel Reduction Project	C	2012	Fuel Modification	56
IV		South Dunsmuir Fuel Break	P	2011	Fuel Modification	20
IV	01-BLM-0098	McCloud FMZ Phase #1	C	2003	Fuel Modification	83
IV	02-BLM0-0076	McCloud FMZ Phase #2	C	2004	Fuel Modification	32
IV	04-DG-11051400-005	McCloud FMZ Phase #3	C	2006	Fuel Modification	52
IV	05-BLM-0209	McCloud FMZ Phase #4	C	2006	Fuel Modification	43
IV	07USFS9430	McCloud FMZ Phase #4B	C	2006	Fuel Modification	24
IV	07USFS9434	Shasta Forest Interface Project 1	C	2007	Fuel	49
IV		McCloud FMZ #5	C	2012	Fuel Modification	73
IV	09-DG-11052912-151-	Rainbow Ridge Fuelbreak Phase II	C	2011	Fuel Modification	20
IV	12UFS0173	SW Mt. Shasta Fuel Reduction Project, Phase II	C	2014	Fuel Modification	83
IV		Azalea Herbicide	C	2014	Maintenance	35
IV		Thamar Shaded Fuel Break	A	2015	Fuel Modification	46
IV		Sacramento Headwaters Fuel Reduction (Spring Hill)	A		Fuel Modification	150
IV	13USFS-SFA-0135	NE Mt. Shasta Fuel Reduction Project, Phase III	C	2015	Fuel Modification	76
IV	13USFS-SFA-0142	Dunsmuir Fuel Reduction Connection 2013-RCD	C	2015	Fuel Modification	58
I-IV	09USFS0159	Fire Safe Council of Siskiyou County Fuel Reduction	C	2011	Fuel Modification	50
I-IV	10UFS0548	FSCSC Fuel Reduction 2010	C	2012	Fuel Modification	298
I-IV	06BLM9058	FSCSC Planning and Coordination Support	C	2008	CWPP	
I-IV		School and Education Programs	O		Public Outreach	
		Scott River Ranch VMP	P	2017	VMP	1,000

Appendix F. Fire Safe Councils Contact List

Fire Safe Council of Siskiyou County (FSCSC)
Contact: Dale or Giselle Nova, Joint Coordinators;
926-2089-novavita@sbcglobal.net;
Meet 2nd Weds. of the month, 6:30 P.M. at:
Klamath National HQ Office
1711 S. Main St., Yreka, CA

Black Mt. Fire Safe Council
Contact: Joey Hott (530) 905-0080
<Hott106@hotmail.com>
Meetings

Butte Valley Fire Safe Council
Contact: Don Bowen—397-2764 —
<Don_Bowen@nps.gov>
Meetings to be announced

Copco/Bogus Fire Safe Council
Contact: Linda Oliver—459-5623—
oranchmama@aol.com;
Meetings to be announced.

Dunsmuir Fire Safe Council
Contact: Mari Shanta---<dfsc.dunsmuir@gmail.com>
Meetings to be announced

French Creek Fire Safe Council
Contact: Richard Van de Water—468-1214—
rvdw@sisqtel.net
Meeting to be announced.

Greater Weed Area Fire Safe Council
Contact: Kelly Conner—938-2886—
kelly.conner@fruitgrowers.com;
Meetings to be announced.

Happy Camp Fire Safe Council
Contact: George Harper—493-2990—OR
Duane Armbruster—493-2740;
Meet last Wed. of the month at 6:30 P.M.

Hammond Ranch Fire Safe Council
Contact: Randy Klawkow-707-255-7729—
rklowkow@gmail.com
Meetings to be announced

Juniper Flats Fire Safe Council
Contact: Margie King--938-0350--<marjorieking@cot.net>
Meet 2nd Monday of the month

Klamath River Fire Safe Council
Contact: Yvonne Wray--530-465-2411
<yvonne@wolfpackinteractive.com>
Meetings to be announced

Greater Lake Shastina Fire Safe Council
Contact: John McPhee -938-2789--
<mcpheeford@gmail.com>
Meet 1st Tues. of the month; call first for time.

Lower Scott River Road Fire Safe Council
Contact: Perry Daniels—468-5233—daniels@sisqtel.net
Meet 2nd Tues. of the month at 7:00 P.M in the Fort Jones

McCloud Fire Safe Council
Contact: Ron Berryman—964-2103—
berryman839@gmail.com
Meetings to be announced

Mt. Shasta Area Fire Safe Council
Contact: Dale and Giselle Nova—926-2089—
novavita@sbcglobal.net;
Meet 1st Thurs. of the month 7:00 P.M. Rec Bldg of the Mt. Shasta City Park.

Orleans/Somes Bar Fire Safe Council
Contact: Will Harling—627-3202—
<willharling@gmail.com>;
Meet on 3rd Thurs. of the month at 7:00 P.M.

Rattlesnake Creek Fire Safe Council
Contact: Larry Alexander-(530) 468-2888-
lalexander@sisqtel.net;
Meetings to be announced.
.

Salmon River Fire Safe Council
Contact: Kathy Mc Broom—462-4665–karuna@srrc.org
OR-fire@srrc.org
Meet on the last Wed. of the month from 1:00-3:00 P.M.

Scott Bar Fire Safe Council
Contact: Ginetta Clark—496-3327—
sblibrarypo@yahoo.com;
Meeting to be announced.

Scott Valley Fire Safe Council
Contact Ginetta Clark—496-3327—
sblibrarypo@yahoo.com;
Meetings to be announced.

Seiad Valley Fire Safe Council
Contact: Patrick Ayres
fishbook@sbcglobal.net 530-496-3201
OR George Jennings—468-2888—gjennings@sisqtel.net;
Meetings to be announced.

Quartz Valley Fire Safe Council
Contact: Larry Alexander-(530) 468-2888-
lalexander@sisqtel.net;
Meetings to be announced.
.

Yreka Area Fire Safe Council
George Jennings—468-2888—gjennings@sisqtel.net;
Meet 3rd Tuesday of the month at the Klamath National Forest HQ, Yreka, Ca

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Appendix G. Action Plan Expansion Consideration

Rapid progression of increasing wildland fire severity has changed the perspective of citizens living in wildland fire environments. Guidance provided in this CWPP is the basis for actions by individuals, neighborhoods and communities to engage awareness, education, preparedness and fuel reduction activity, working from home/structure outward. Defensible space requirements are a legal obligation and a means toward achieving resilience and survival. Many individuals and neighborhoods recognize the need to proactively expand upon these safety elements where feasible.

Following is an expanded planning concept and application tools for consideration across Siskiyou County to address expanding wildfire resilience actions. This concept was originally developed to engage a wildfire protection strategy that protects communities and natural resources across the network (a.k.a. framework) of Sierra Nevada forests. The success of this larger scale planning will depend upon cooperative support and leadership from communities, agencies, resource stewards and local entities. Agency leaders can explore adjustments in agency documentation (i.e., USFS Northwest Forest Plan) to adapt, plan and expedite treatments like those in this Sierra Nevada concept. A definitive expanded strategy and clear implementation actions will set the stage toward reducing catastrophic wildfire loss and account for current trends of human population in the wildland urban interface.

Basic concepts utilized in the Sierra Nevada Plan assign specific boundaries or zones within a community's Wildland Urban Interface (WUI). Two primary zones surround a community: the 'defense zone', immediately adjacent to the community and the 'threat zone' adjoins and extends out from the defense zone. Generally, zone distance specifications are: defense zone generally spans ¼ mile from the outer edge of the community; Threat Zone generally spans 1¼ miles beyond the Defense Zone. Fuel treatment prescriptions are more intensive immediately adjacent to the community in the Defense Zone. The following descriptions in italicized text are from the Sierra Nevada Plan Record of Decision Amendment document (January 2004). (<u>NOTE: the terms "intermix" and "interface" can be used interchangeably</u>):

Wildland Urban Intermix/Interface: Defense Zones

<u>Designation</u>

The wildland urban interface zone (WUI) is an area where human habitation is mixed with areas of flammable wildland vegetation. It extends out from the edge of developed private land into Federal, private, and State jurisdictions. The WUI is comprised of two zones: the defense zone and the threat zone.

The WUI defense zone is the buffer in closest proximity to communities, areas with higher densities of residences, commercial buildings, and/or administrative sites with facilities. Defense zones generally extend roughly ¼ mile out from these areas; however, actual defense zone boundaries are determined at the project level following national, regional and forest policy. In particular, the Healthy Forest Restoration Act of 2003 identifies areas to be included in the WUI. Local fire management specialists determine the extent, treatment orientation, and prescriptions for the WUI based on historical fire spread and intensity, historical weather *patterns, topography, access. Defense zones should be of sufficient extent that fuel treatments within them will reduce wildland fire spread and intensity sufficiently for suppression forces to succeed in protecting human life and property.*

Desired Conditions

- *Stands in defense zones are fairly open and dominated primarily by larger, fire tolerant trees.*
- *Surface and ladder fuel conditions are such that crown fire ignition is highly unlikely.*
- *The openness and discontinuity of crown fuels, both horizontally and vertically, result in very low probability of sustained crown fire.*

Wildland Urban Intermix/Interface Threat Zones

Designation

The WUI threat zone typically buffers the defense zone; however, a threat zone may be delineated in the absence of a defense zone under certain conditions, including situations where the structure density and location do not provide a reasonable opportunity for direct suppression on public land, but suppression on the private land would be enhanced by fire behavior modification on the adjacent public land.

Threat zone boundaries are determined at the project level following national, regional and forest policy. Threat zones generally extend approximately 1¼ miles out from the defense zone boundary; however, actual extents of threat zones are based on fire history, local fuel conditions, weather, topography, existing and proposed fuel treatments, and natural barriers to fire. Fuels treatments in these zones are designed to reduce wildfire spread and intensity. Strategic landscape features, such as roads, changes in fuels types, and topography may be used in delineating the physical boundary of the threat zone

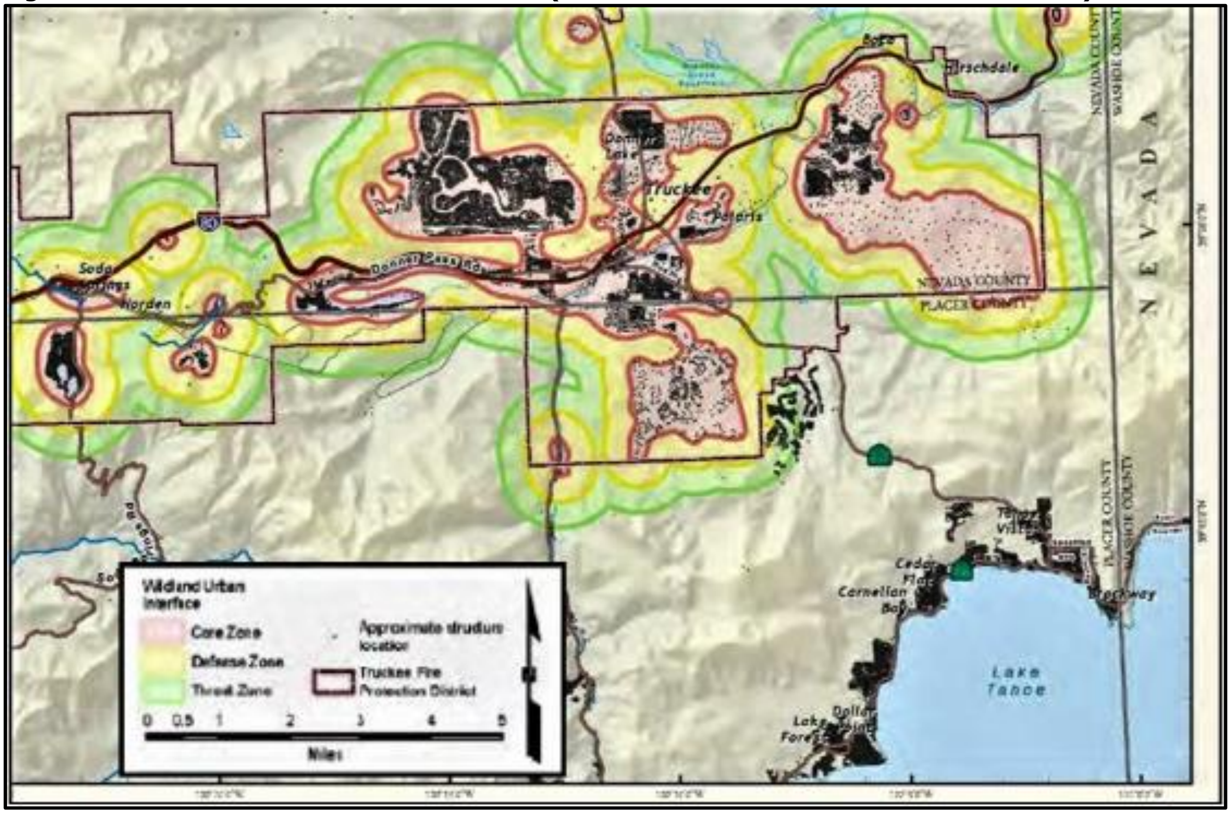
Desired Conditions

Under high fire weather conditions, wildland fire behavior in treated areas within the threat zone is characterized as follows:

- *flame lengths at the head of the fire are less than 4 feet;*
- *the rate of spread at the head of the fire is reduced to at least 50 percent of pre-treatment levels;*
- *hazards to firefighters are reduced by managing snag levels in locations likely to be used for control of prescribed fire and fire suppression consistent with safe practices guidelines;*
- *production rates for fire line construction are doubled from pre-treatment levels; and*
- *tree density has been reduced to a level consistent with the site's ability to sustain forest health during drought conditions.*

Future Actions in Siskiyou County's Community Wildfire Environment will depend on the collaborative response of all citizens and agencies to implement actions described in this CWPP while exploring a larger scale, long-term strategy expanding community resilience. The concepts per Sierra Nevada Framework are a model to discuss and adjust as appropriate based on local conditions and input from local wildfire and forestry expertise (e.g., Figure 1 below displays defense and threat zones in Truckee, California).

Figure 1 – Portion of Truckee CA: WUI Zones (Truckee Fire Protection District CWPP 2016)



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Appendix H. Map Packet

The following 7 key maps referenced in Part I and Part II are reproduced in this Appendix at full scale, and in the order in which they originally appear in each Part and Subsection. Map order in Part I is slightly different than map order in Part II due to narrative considerations.

1. **Maps From PART I – General Elements (Siskiyou County)**
    1. Direct Protection Area
    2. Vegetation/Fuel Model
    3. Fire History
    4. Communities At Risk with WUI boundaries
    5. Fuel Rank
    6. Fire Threat
    7. Fire Severity

2. **Maps From PART II - Planning Regions (Butte Valley, Mid-Klamath, Salmon, Scott Valley, Shasta Valley, Upper Sacramento)**
    1. Communities At Risk with WUI boundaries
    2. Vegetation/Fuel Model
    3. Fuel Rank
    4. Fire Threat
    5. Fire Severity
    6. Fire History
    7. Direct Protection Area

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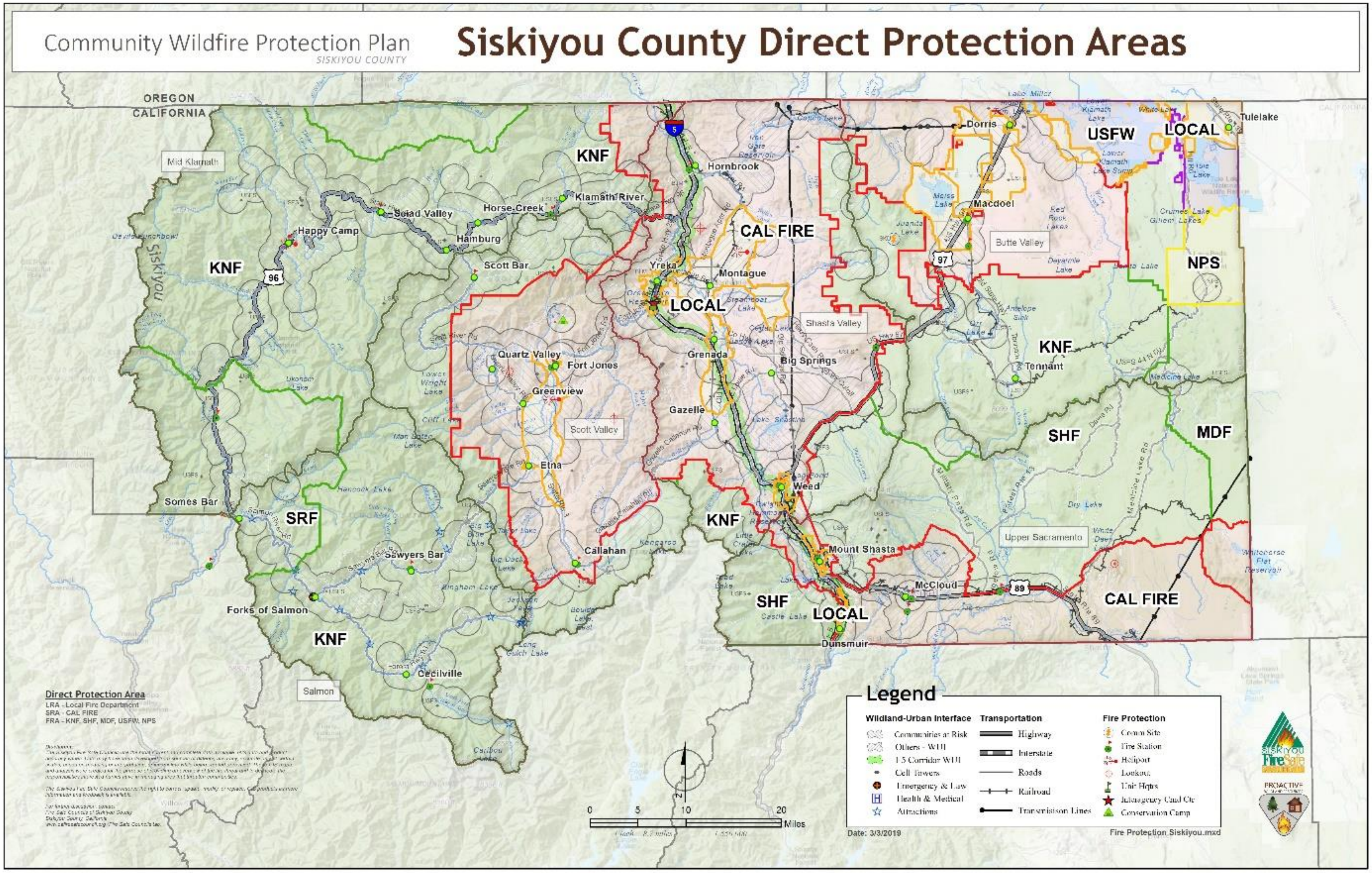
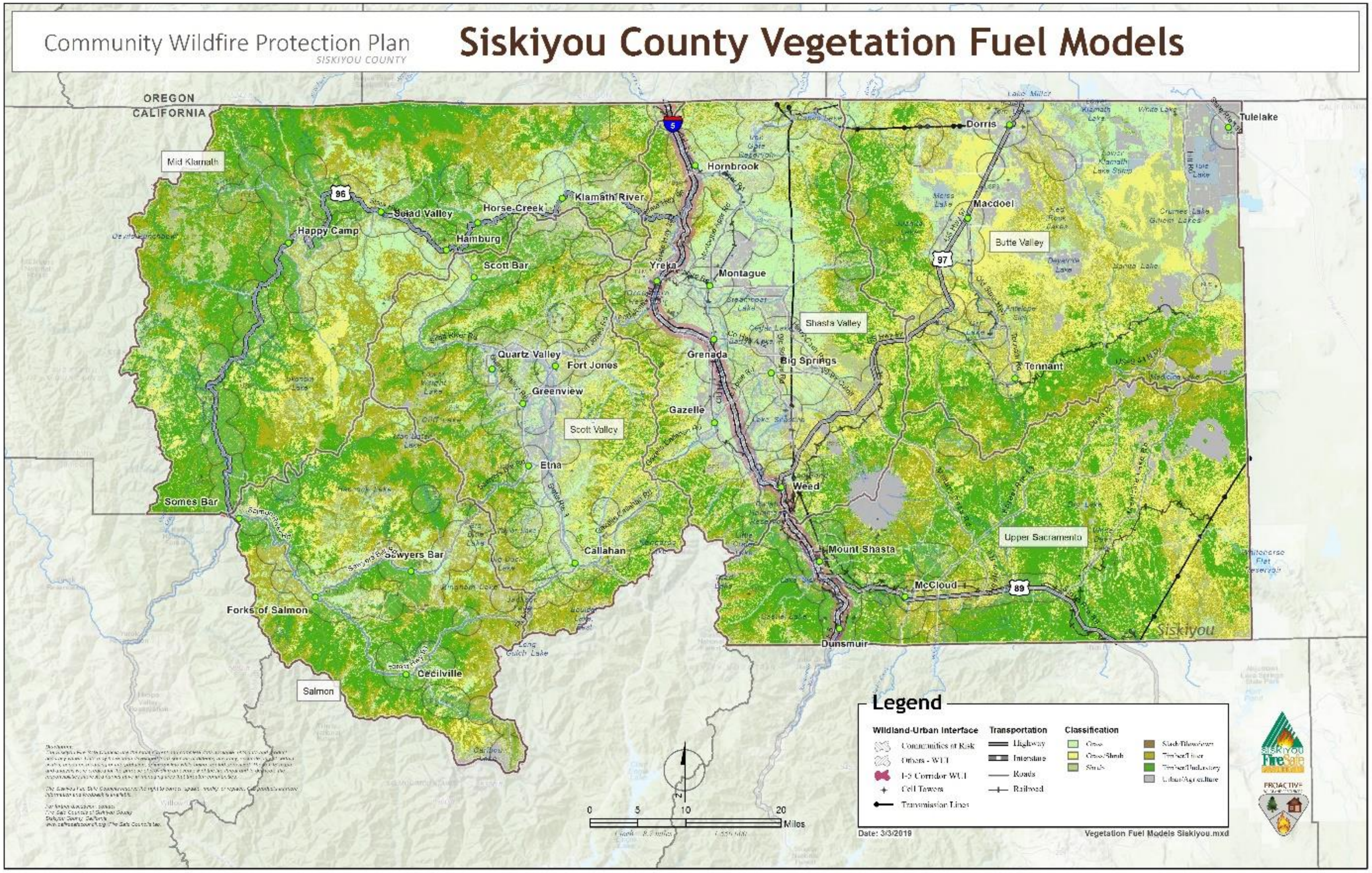
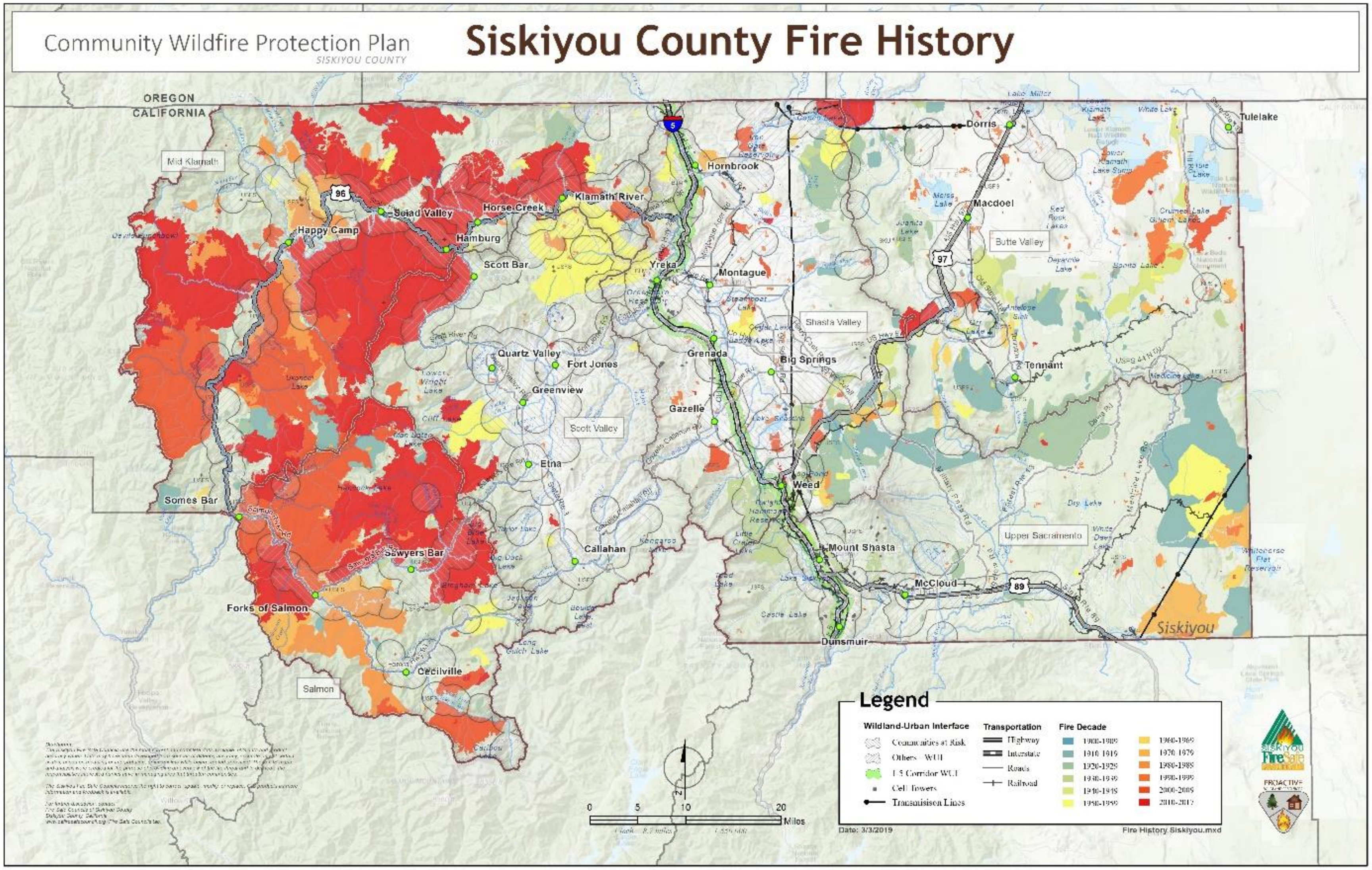
1) **Direct Protection Areas – Siskiyou County**



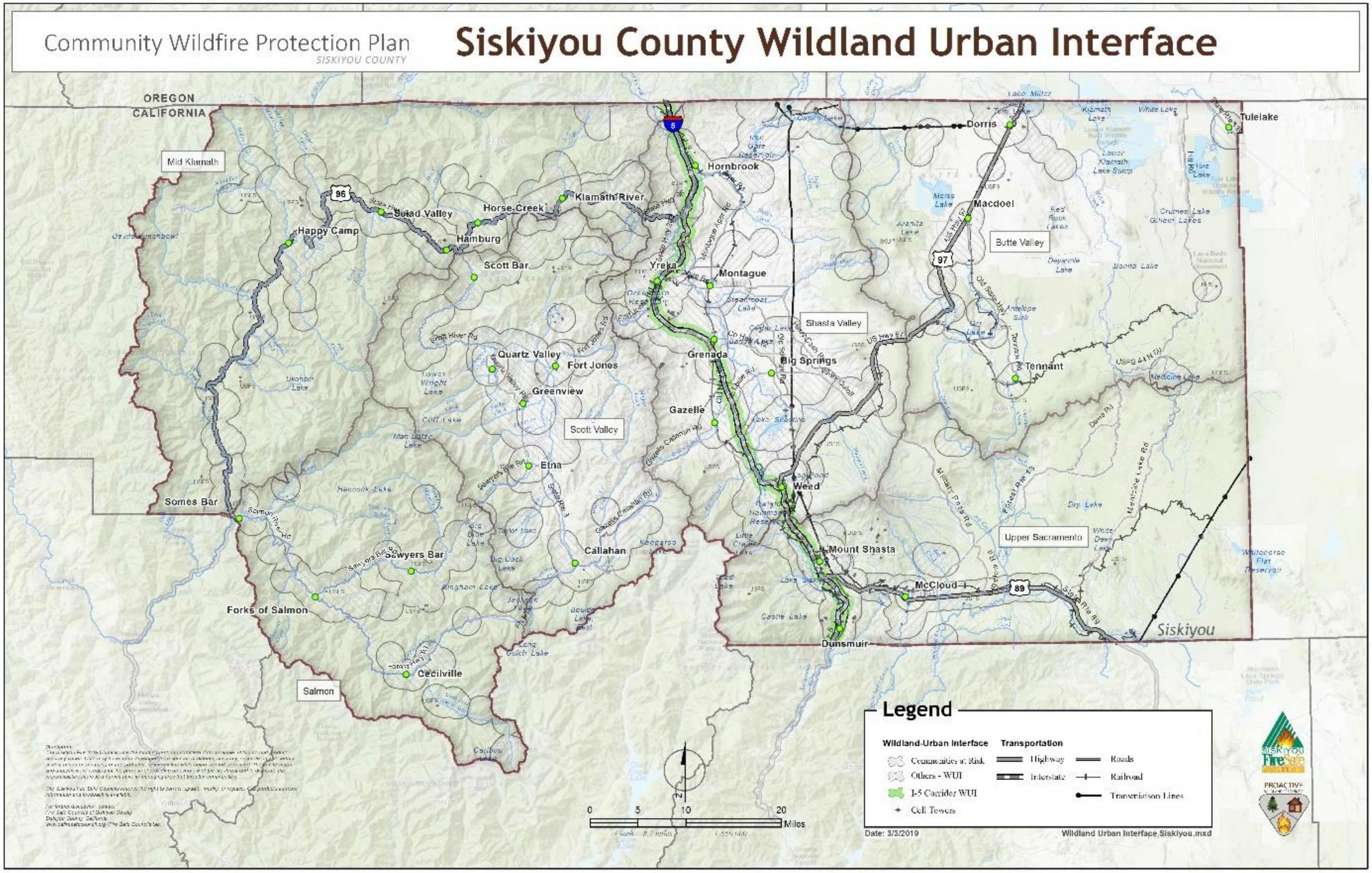
2) Vegetation Fuel Models - Siskiyou County



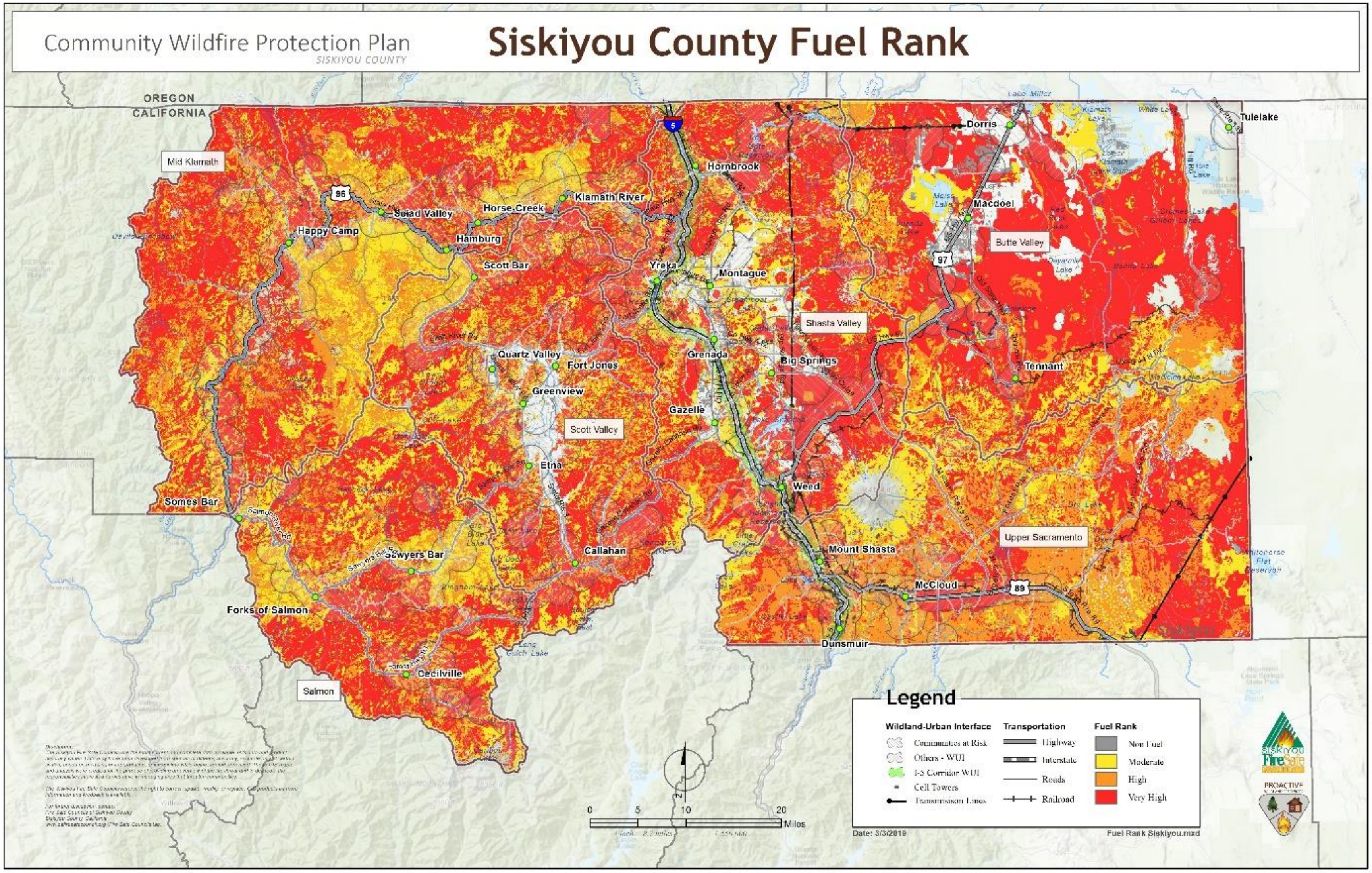
3) Fire History - Siskiyou County (depicted by decade 1900-2017)



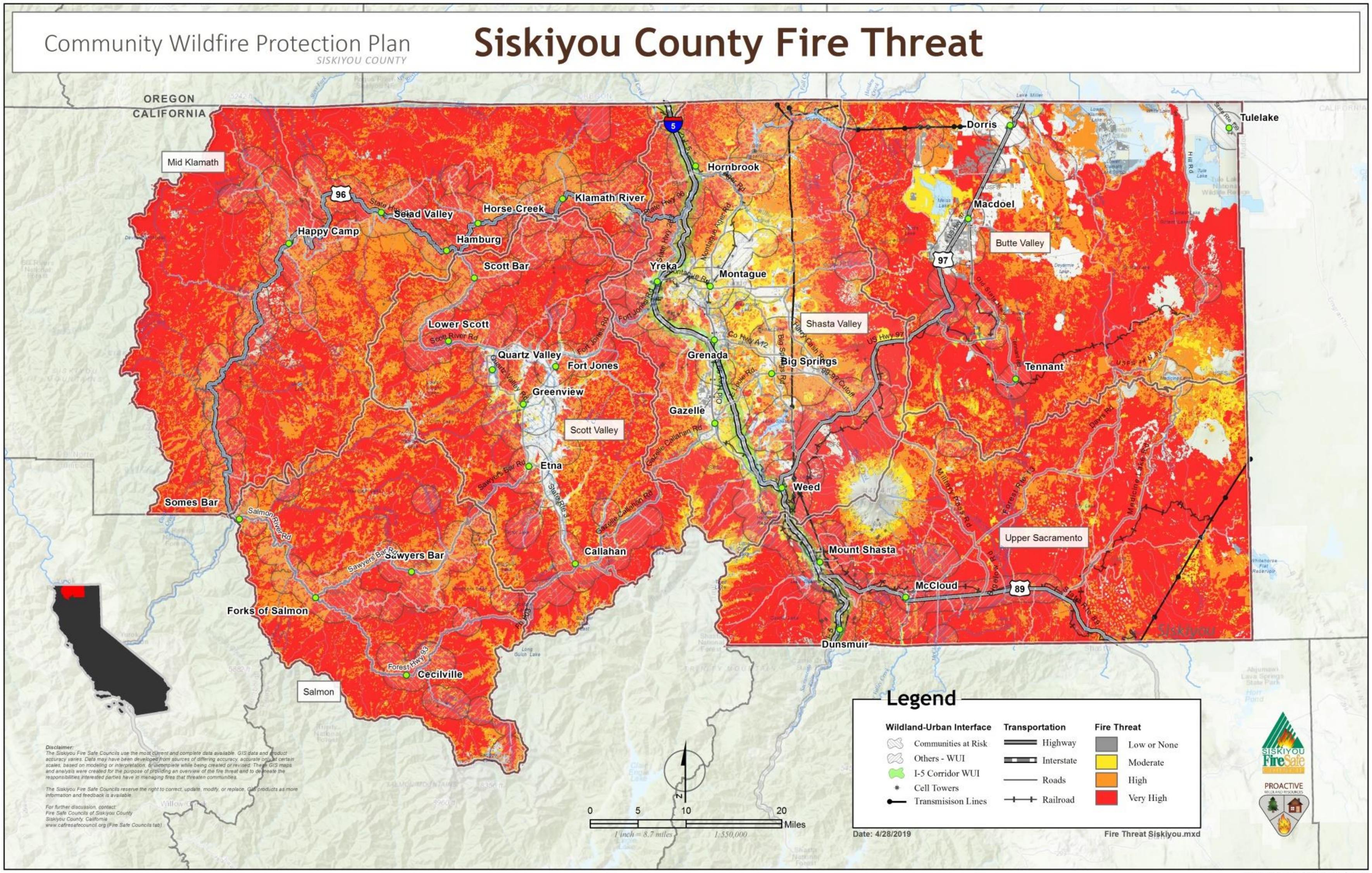
4) Communities At Risk with WUI boundaries - Siskiyou County



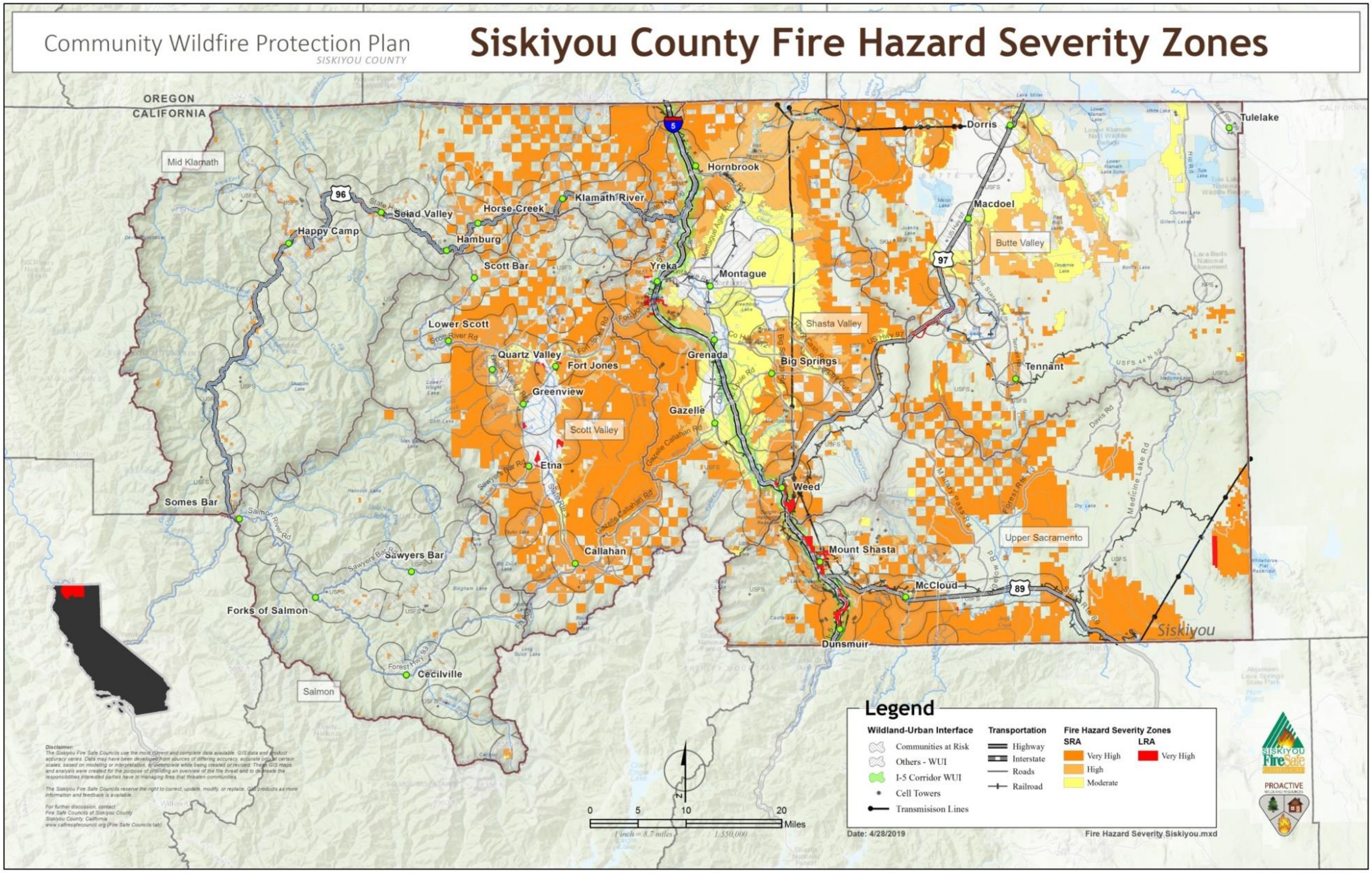
5) Fuel Rank - Siskiyou County



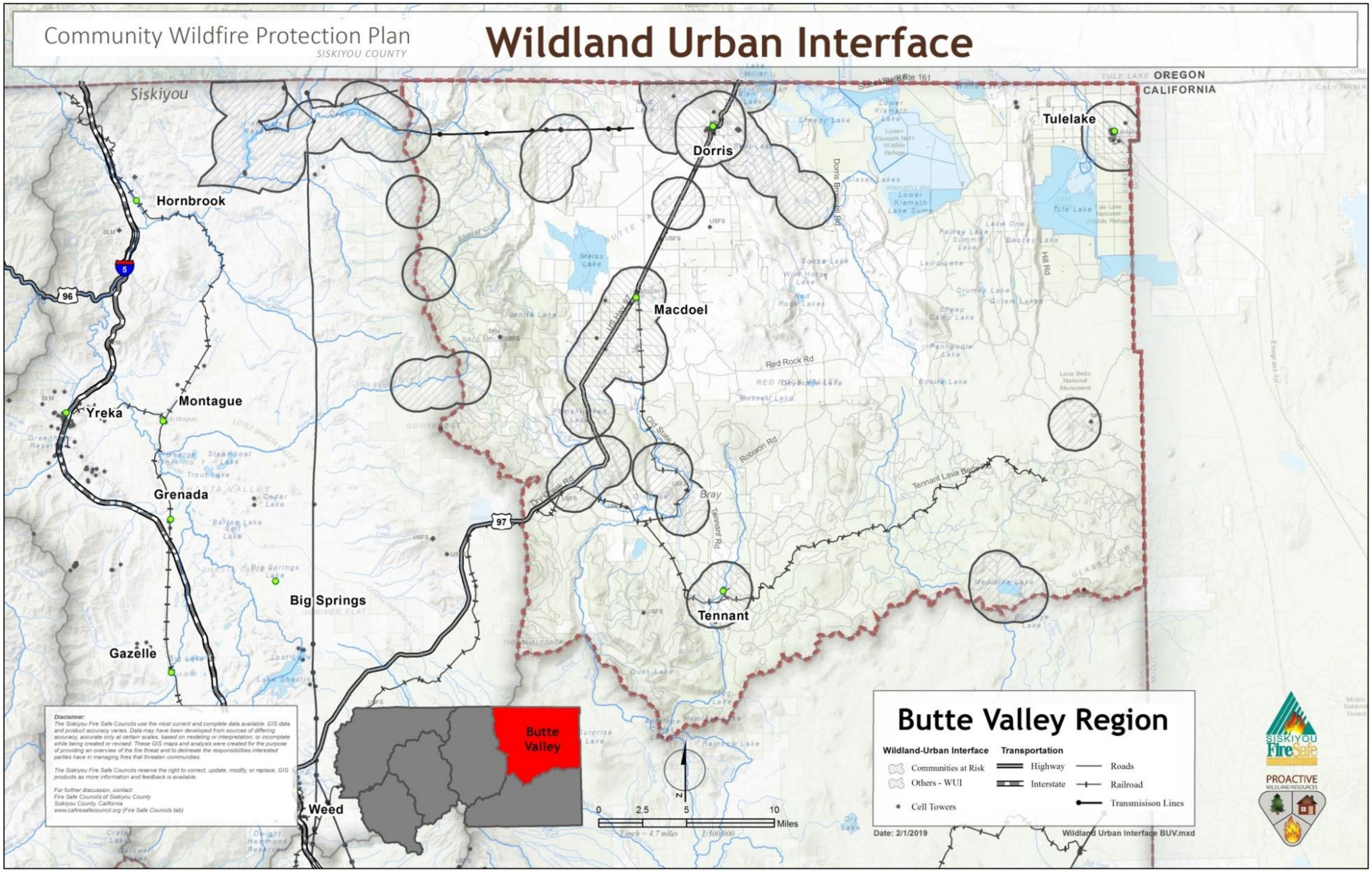
6) Fire Threat - Siskiyou County



7) Fire Severity – Siskiyou County

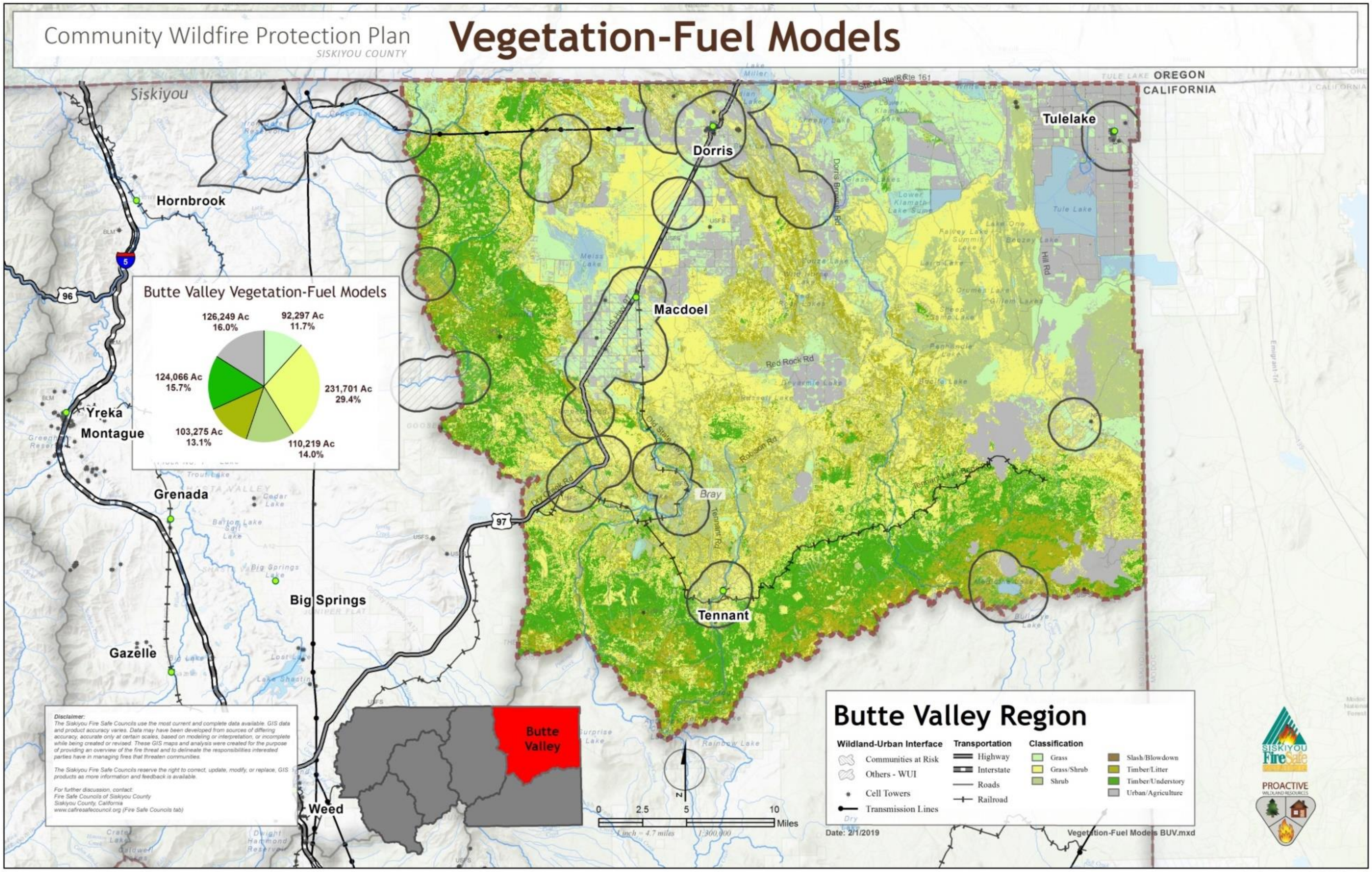


1) Communities At Risk with WUI Boundaries - Butte Valley PR

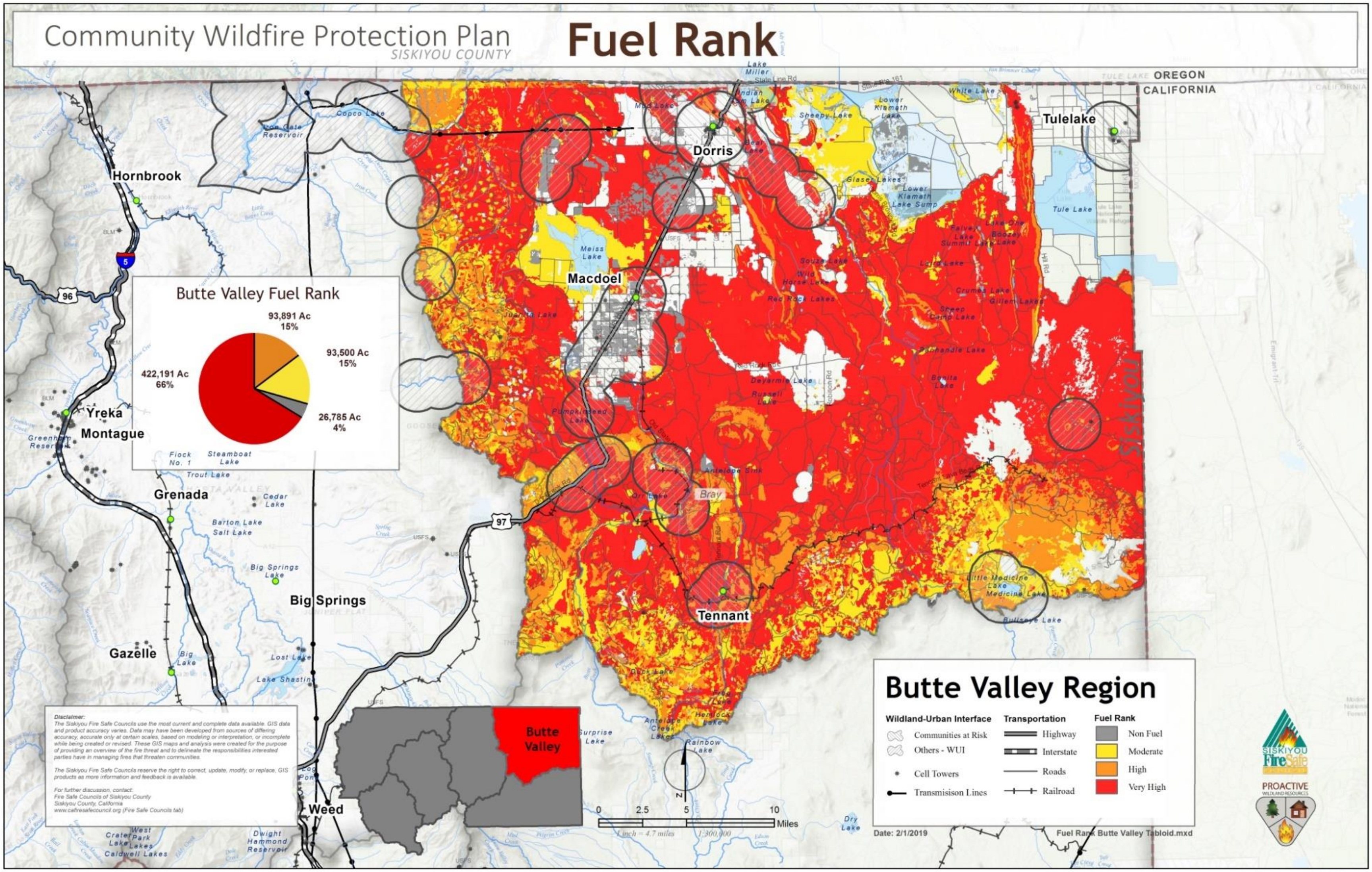


Coordinate System: NAD 1983 UTM Zone 10N

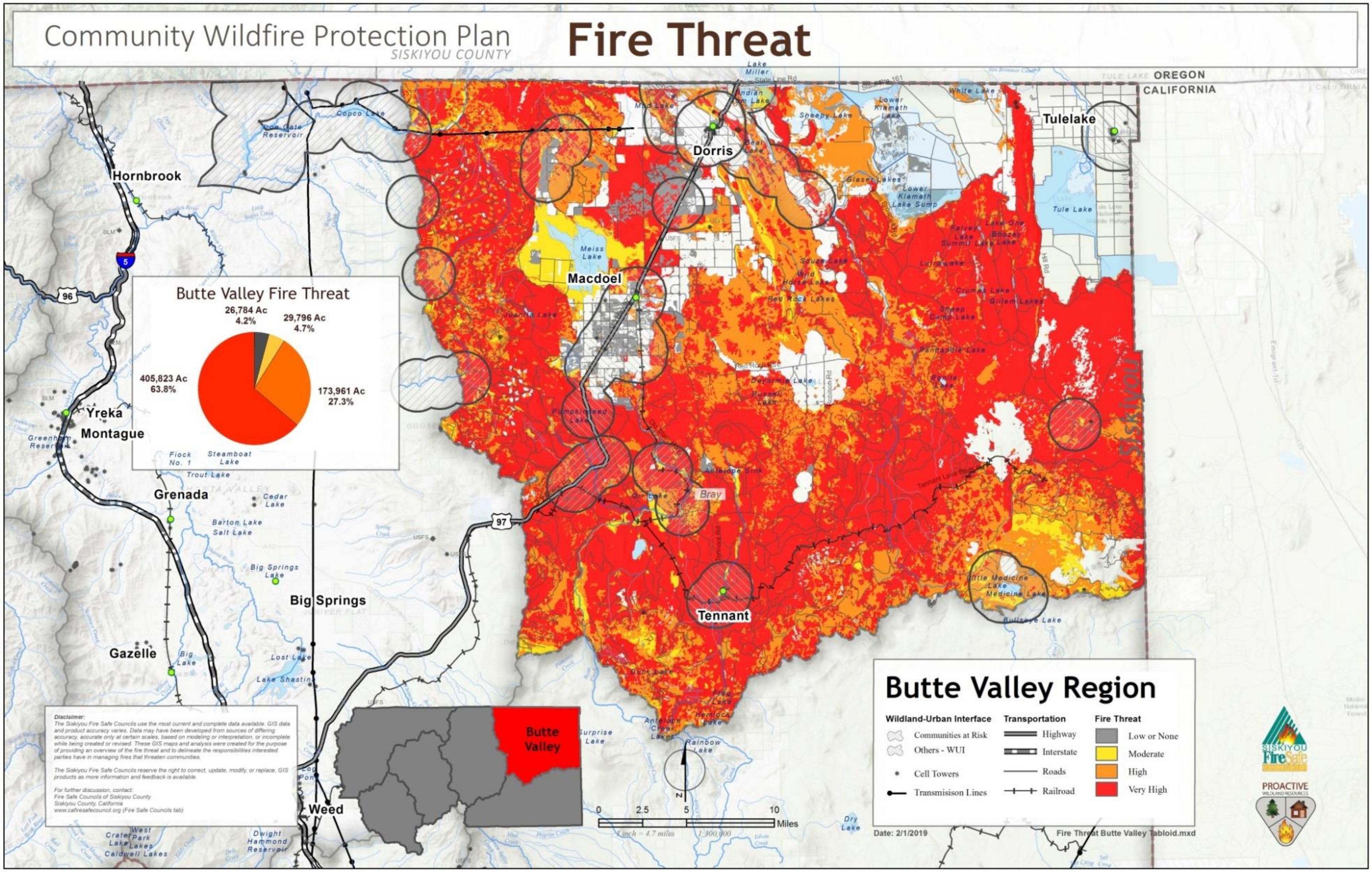
2) Vegetation Fuel Models - Butte Valley PR



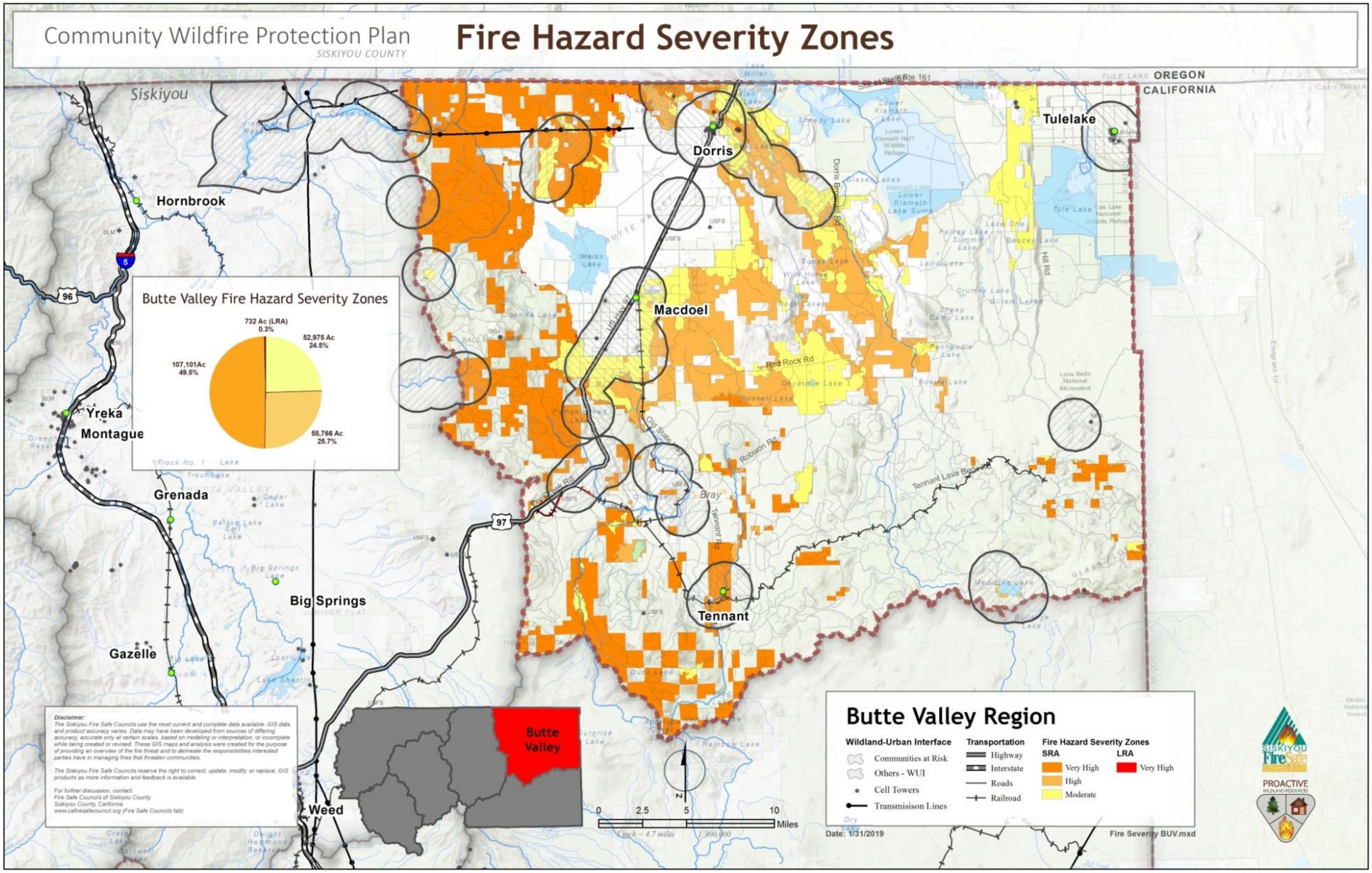
3) Fuel Rank - Butte Valley PR



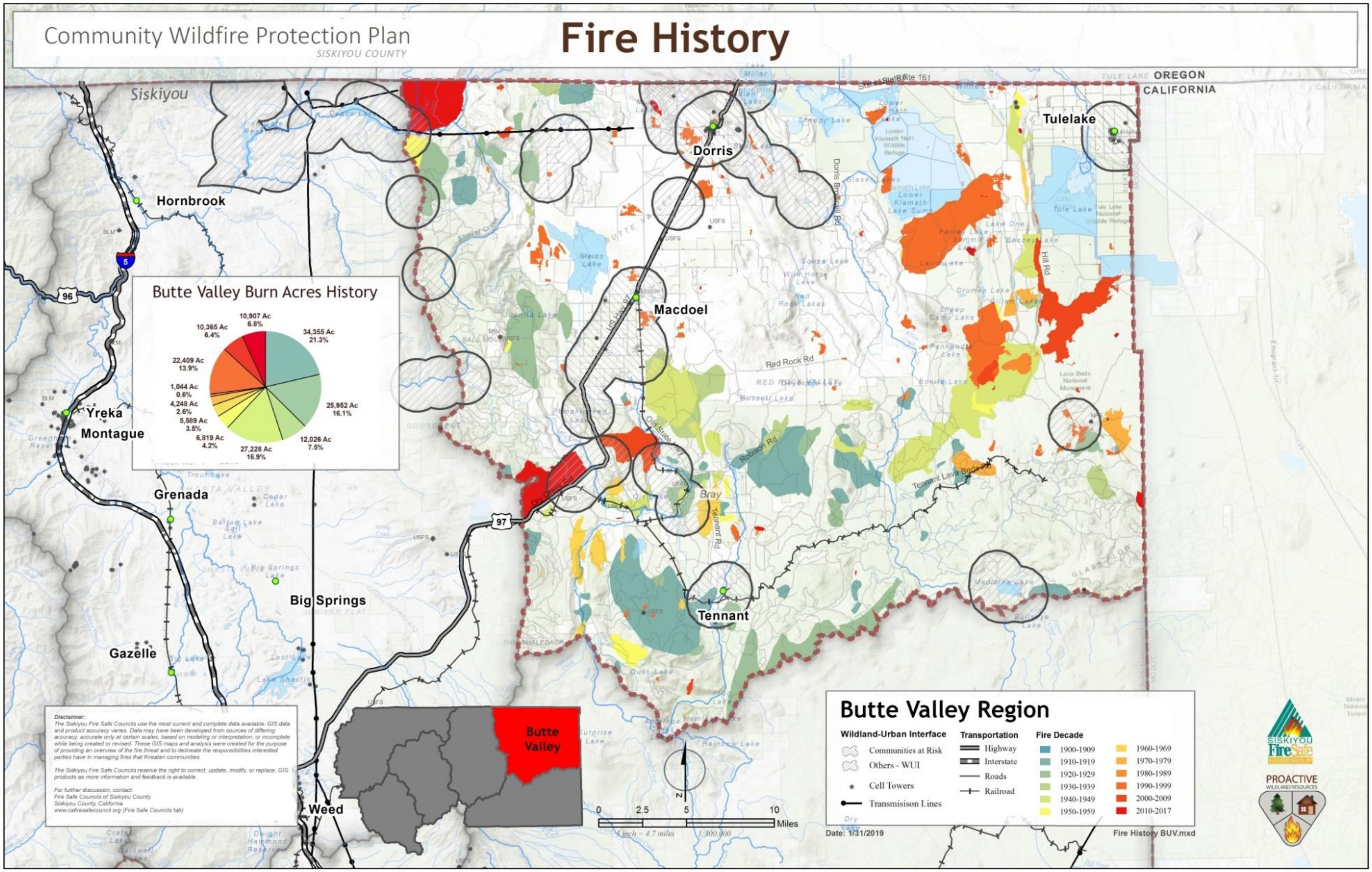
4) Fire Threat - Butte Valley PR



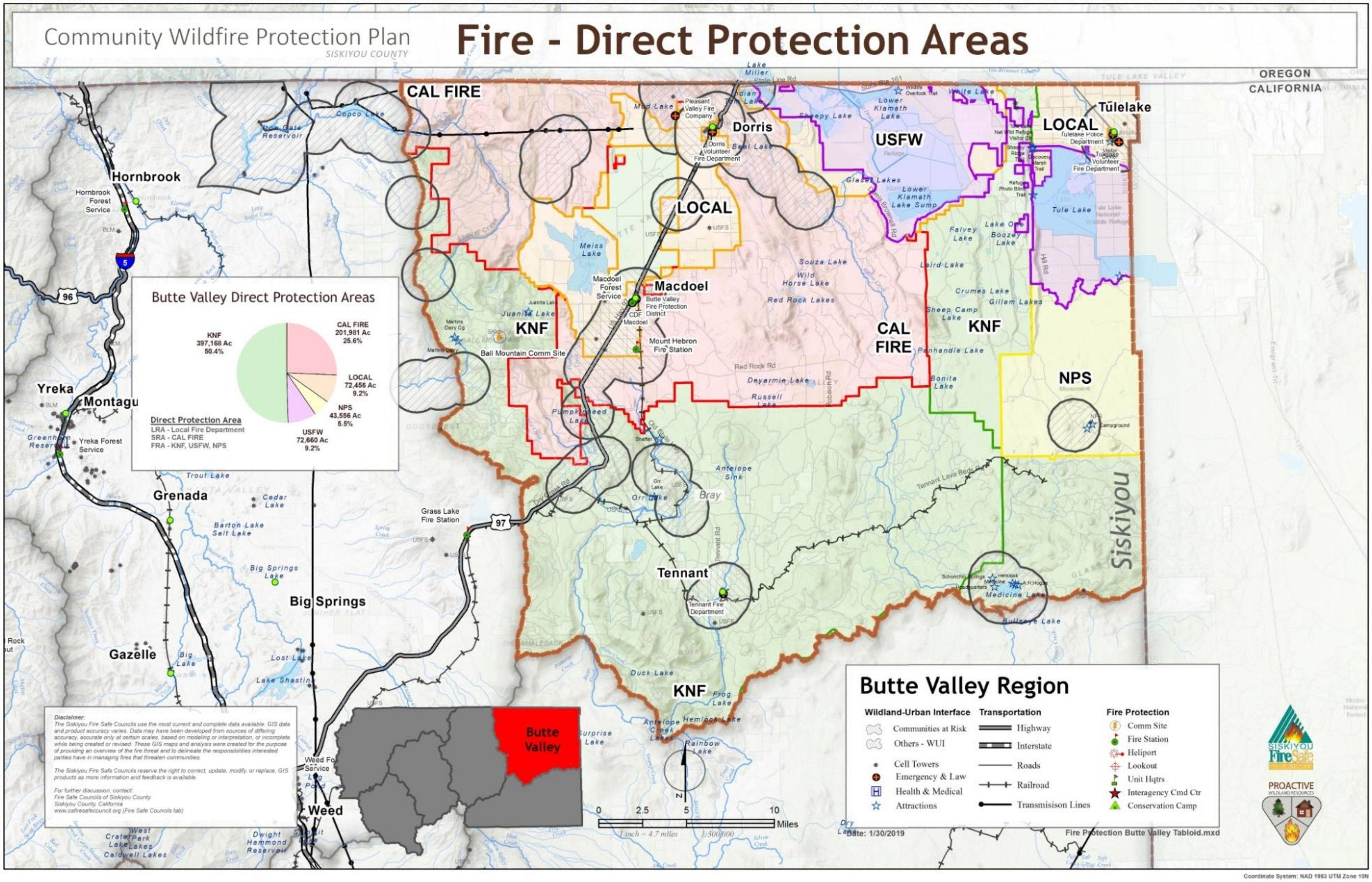
5) Fire Severity – Butte Valley PR



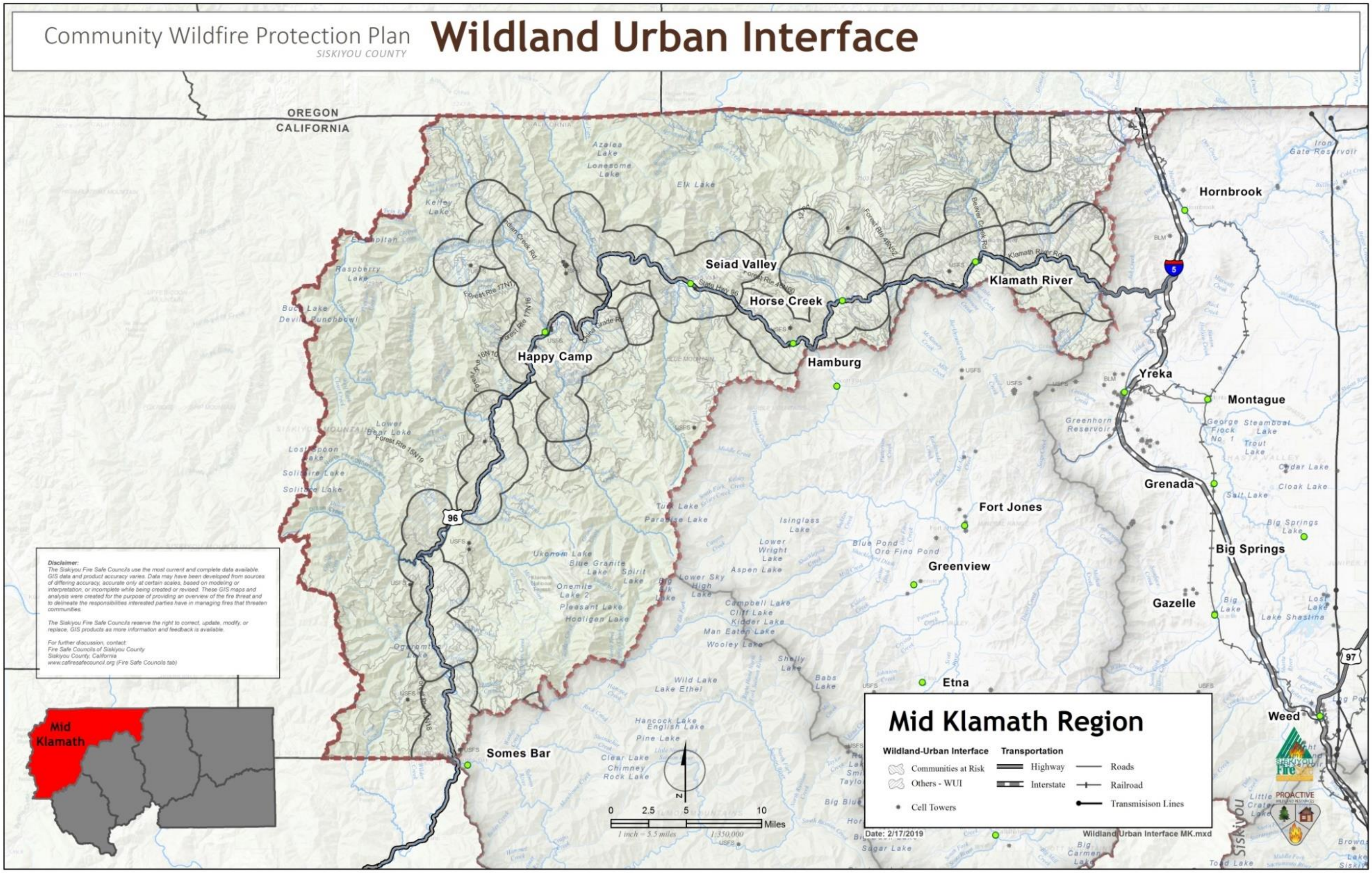
6) Fire History – Butte Valley PR (depicted by decade 1900-2017)



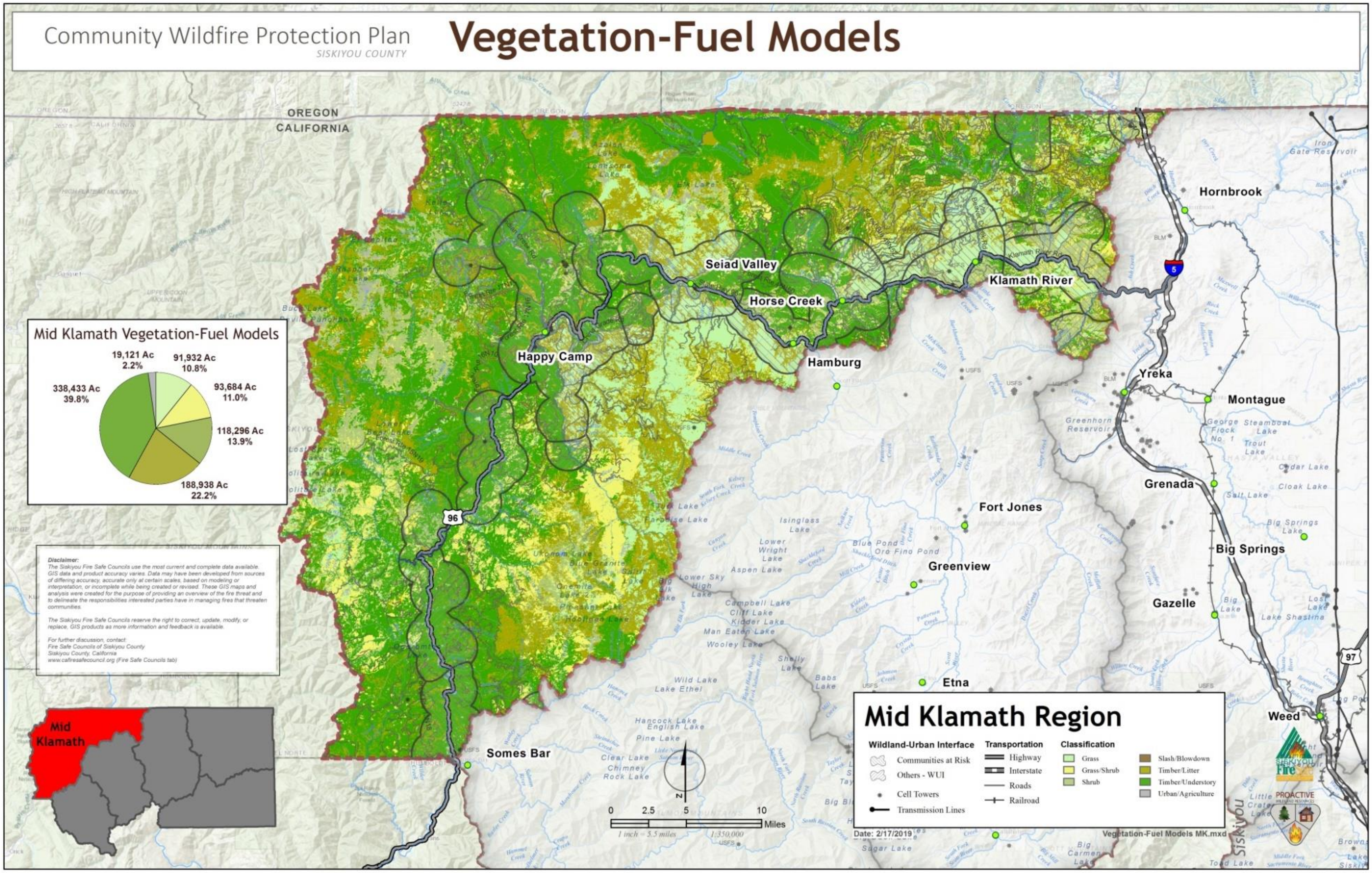
7) Direct Protection Areas – Butte Valley PR



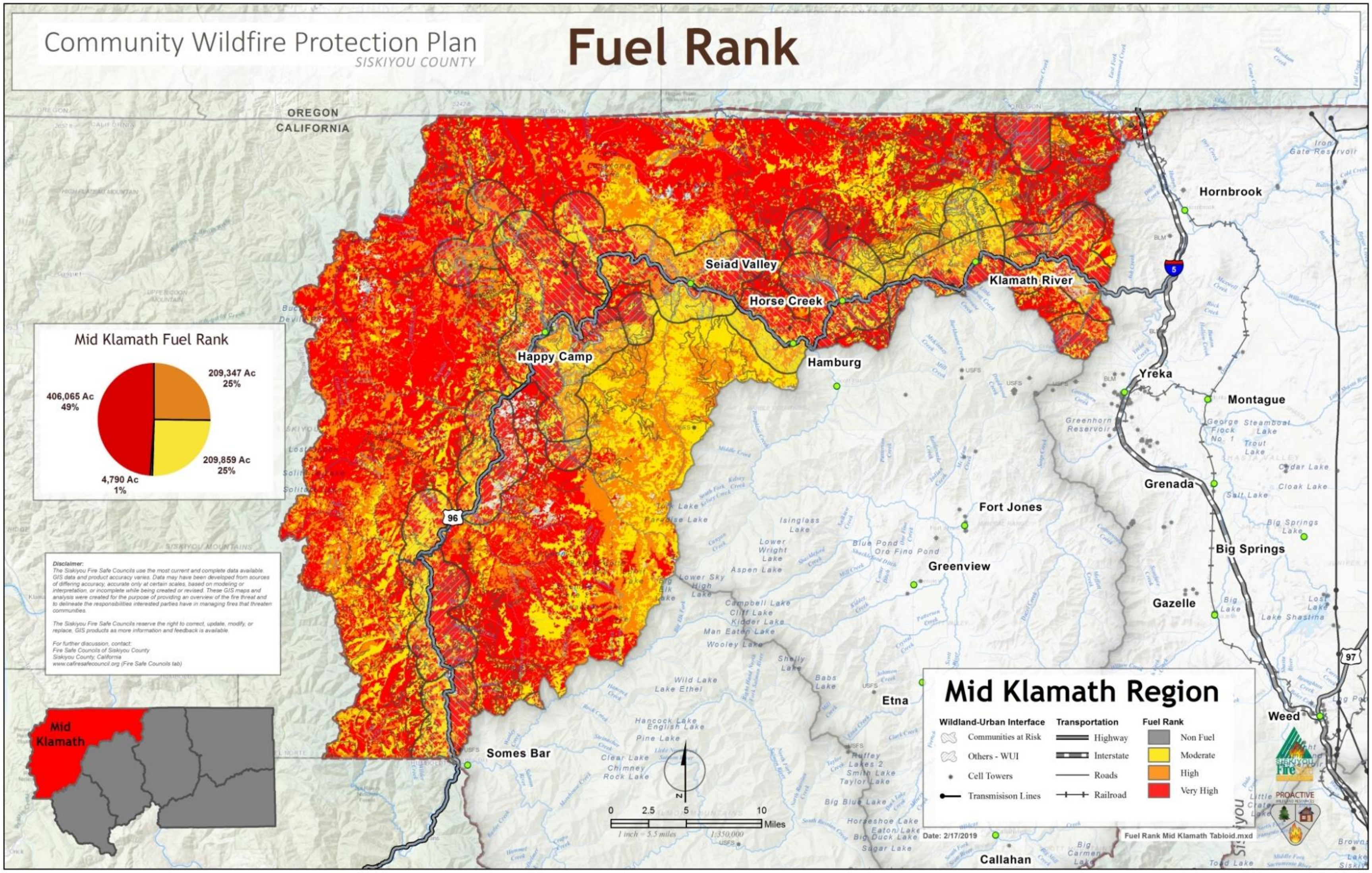
1) Communities At Risk with WUI Boundaries - Mid-Klamath PR



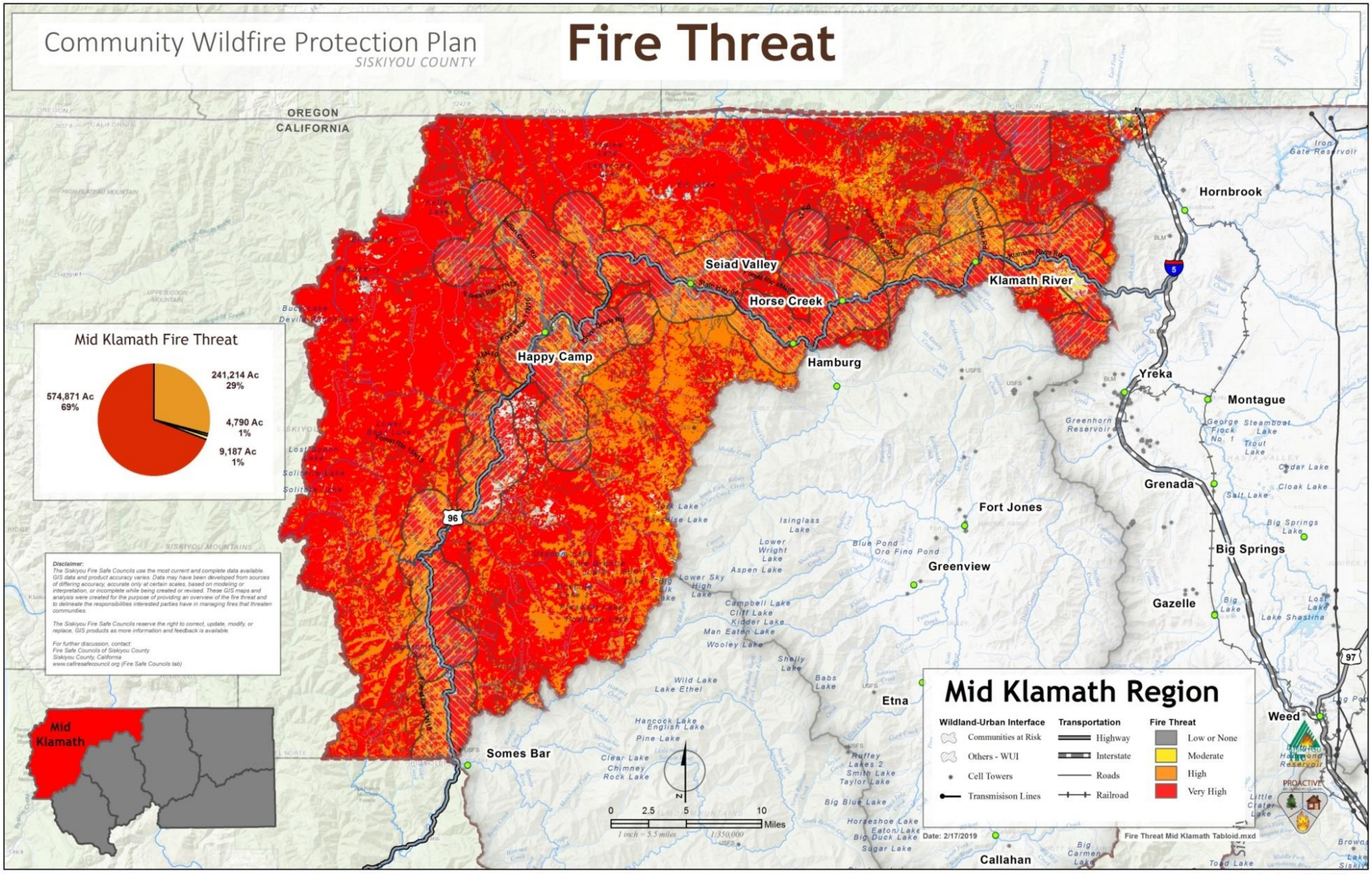
2) Vegetation Fuel Models - Mid-Klamath PR



3) Fuel Rank - Mid-Klamath PR



4) Fire Threat - Mid-Klamath PR



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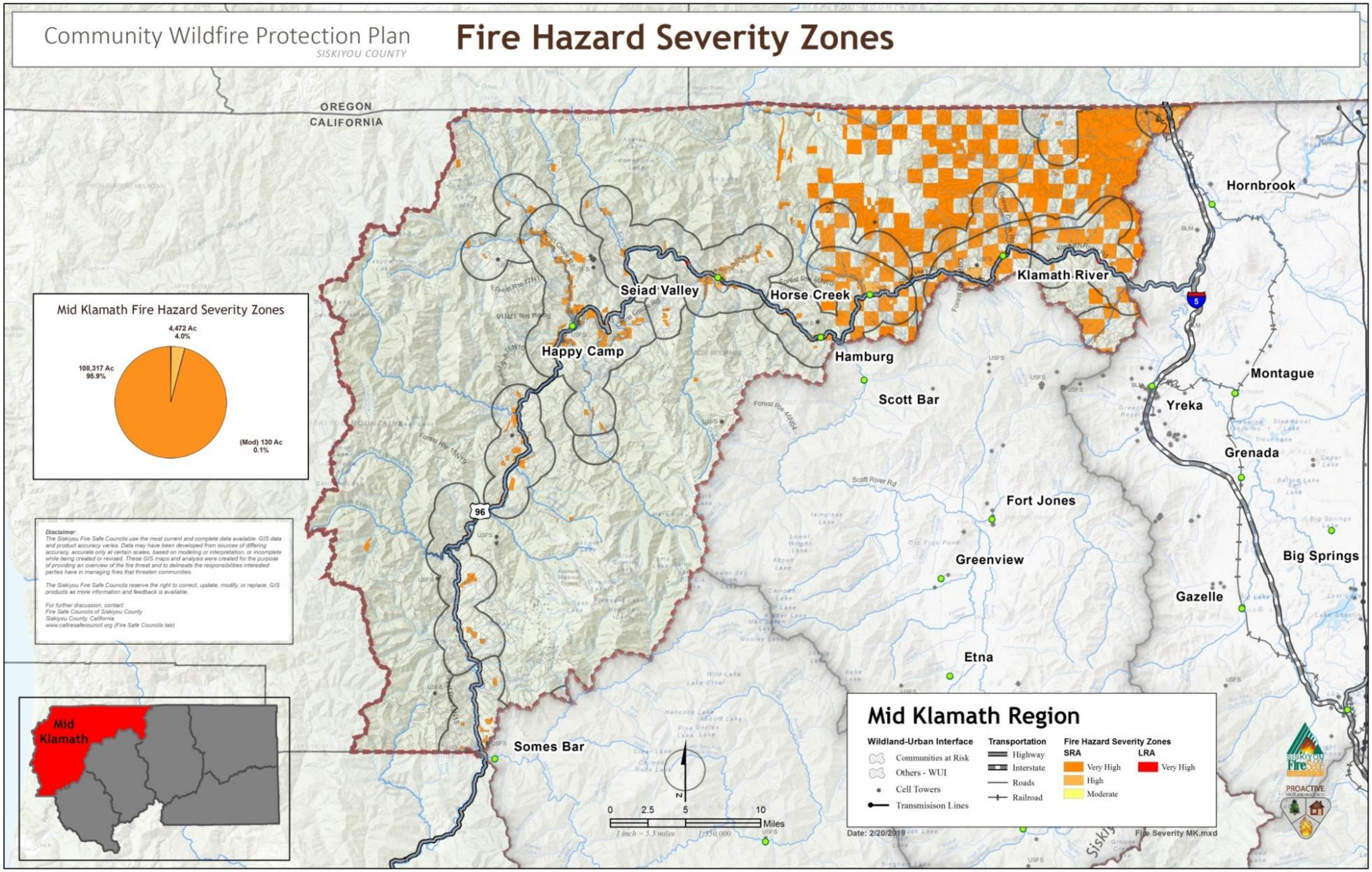

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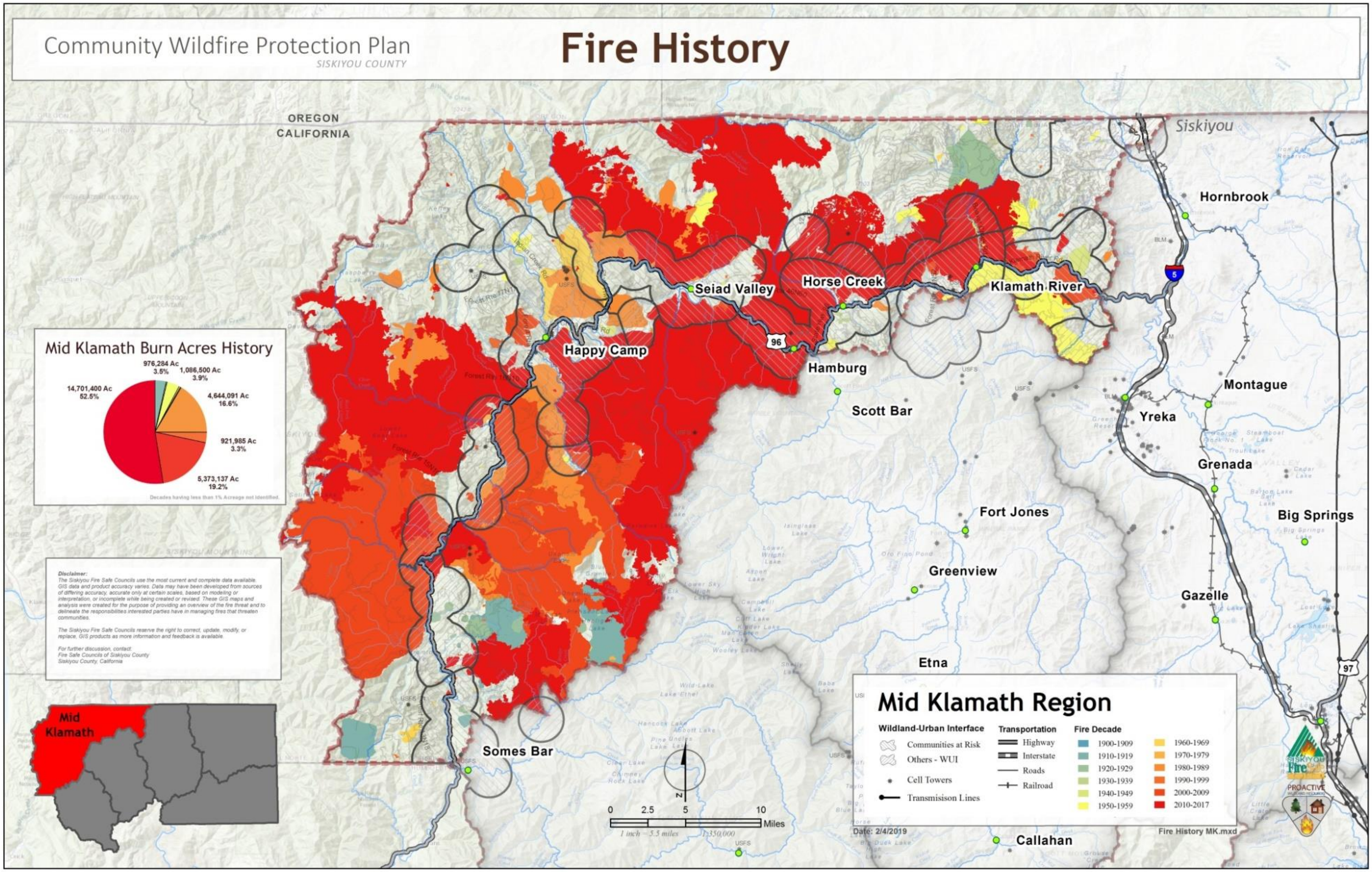
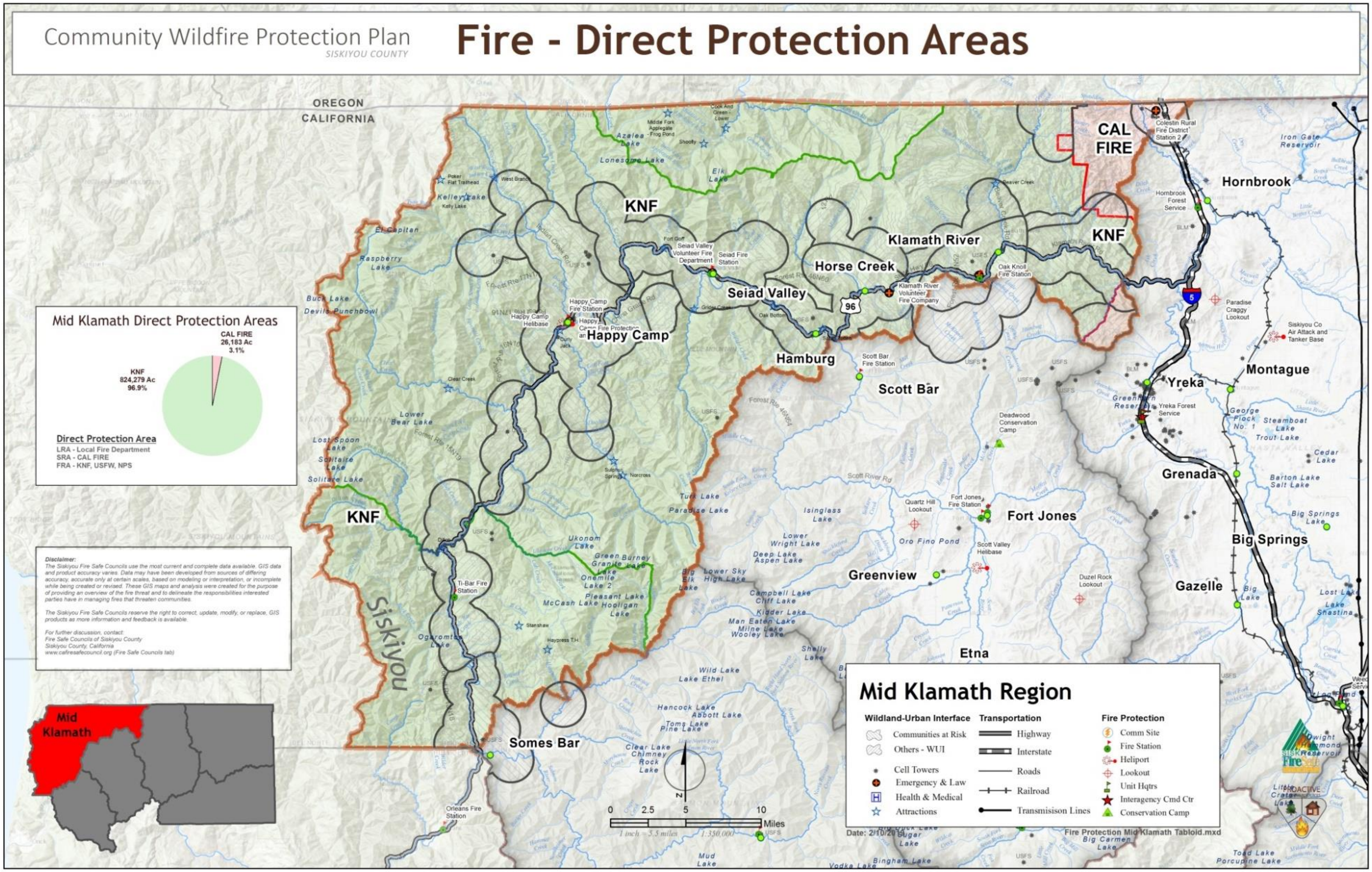
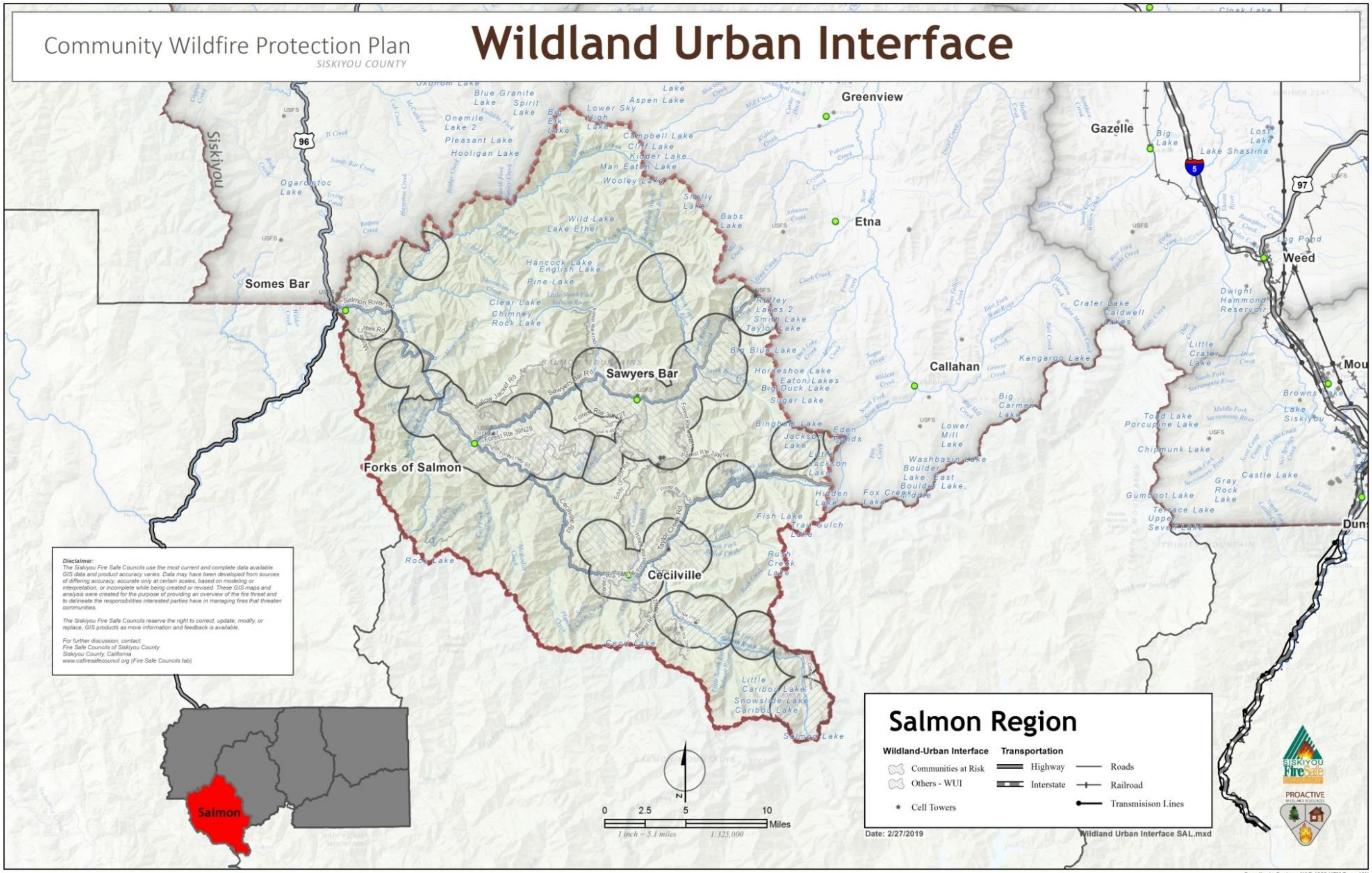


7) Direct Protection Areas – Mid-Klamath PR



1) Communities At Risk with WUI Boundaries - Salmon PR



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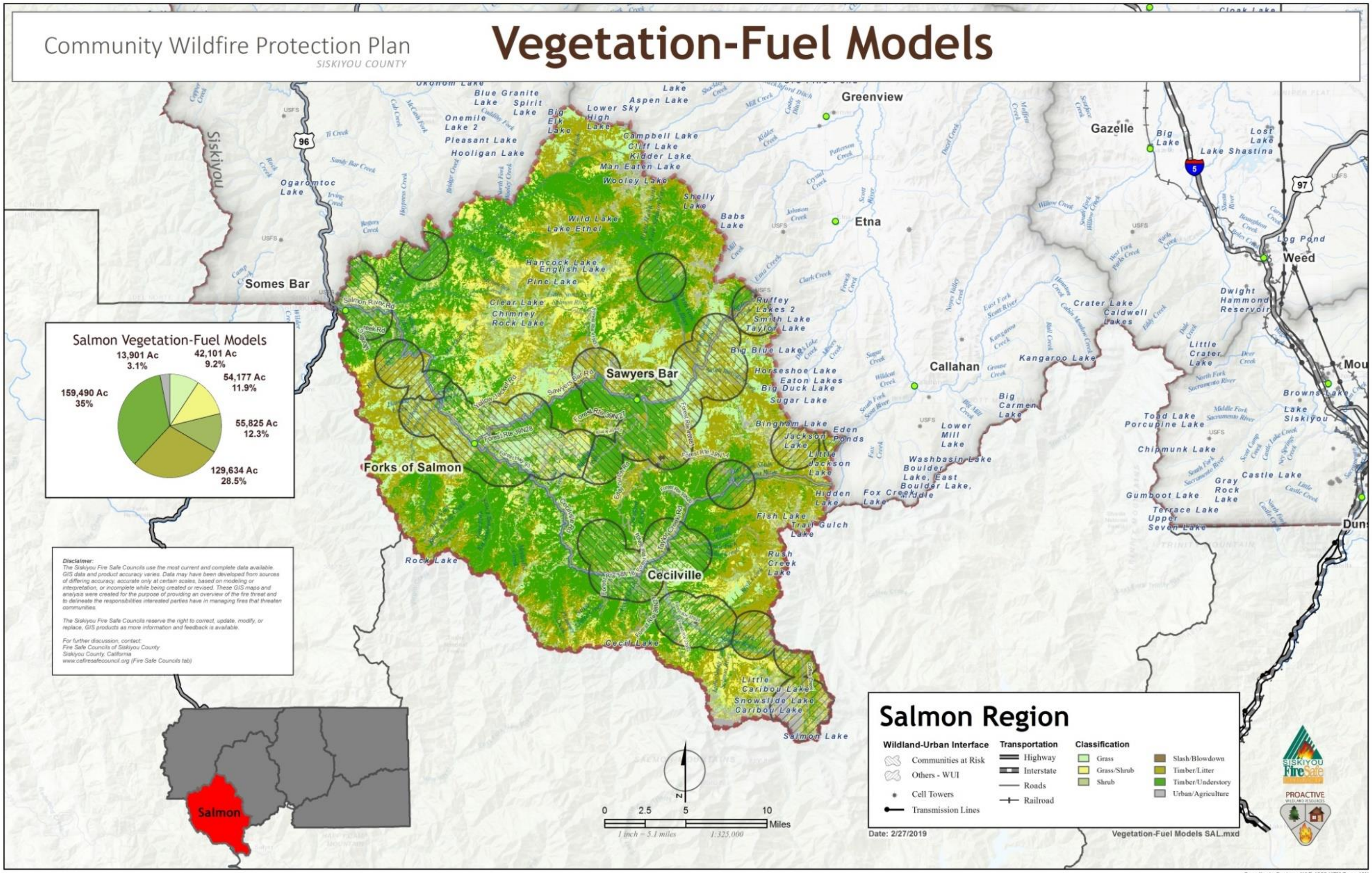
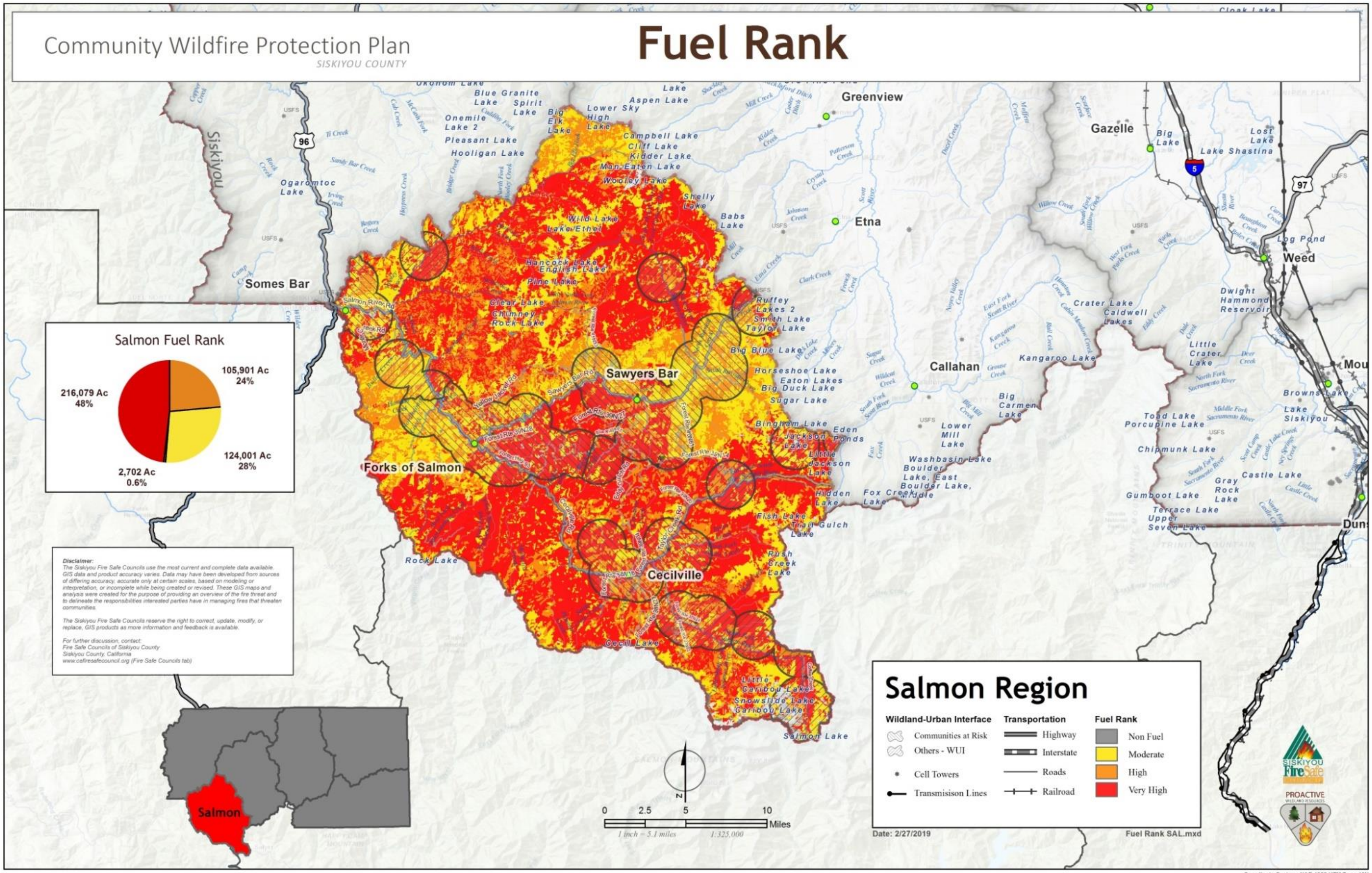
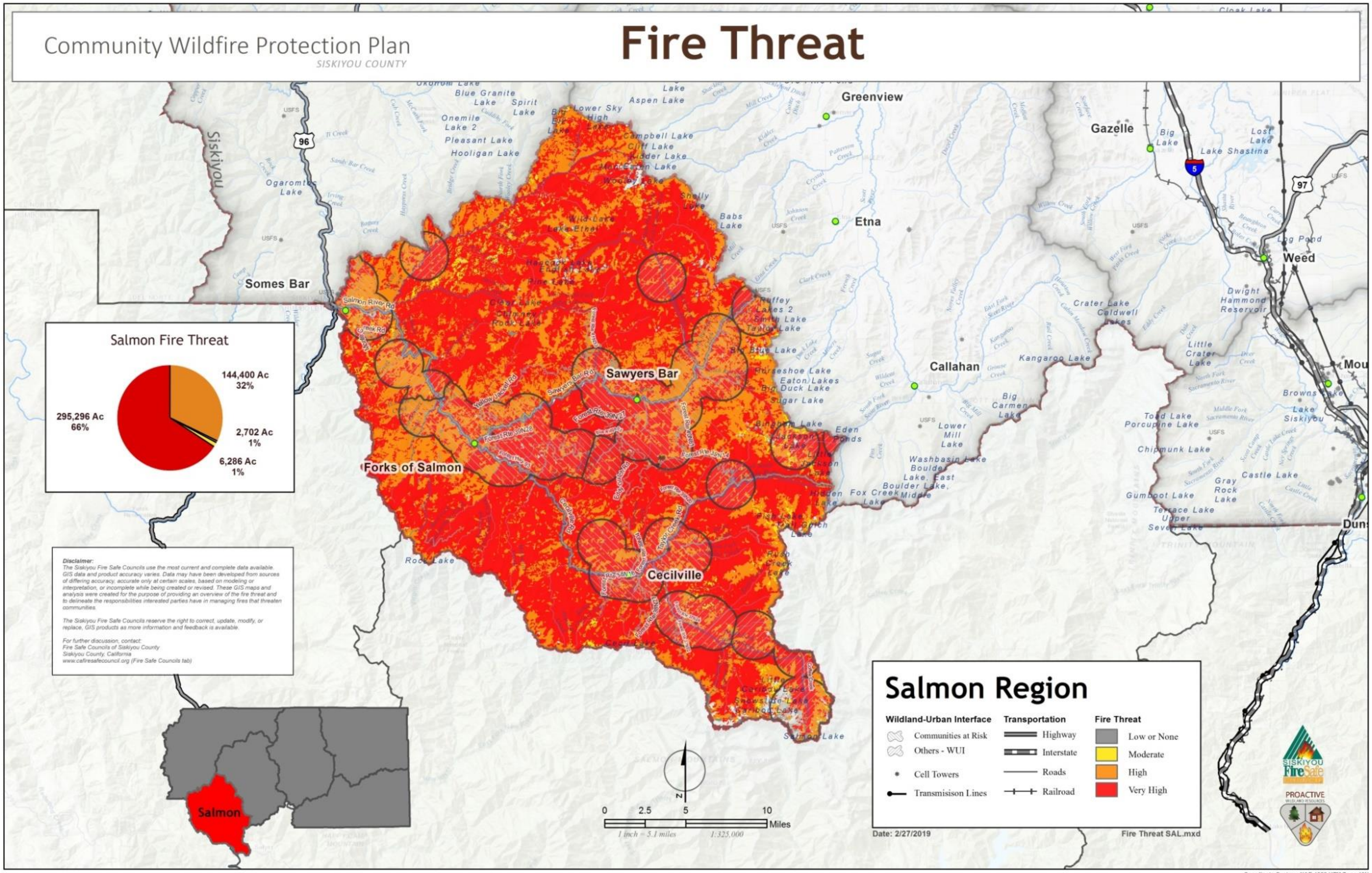


3) Fuel Rank - Salmon PR



4) Fire Threat - Salmon PR



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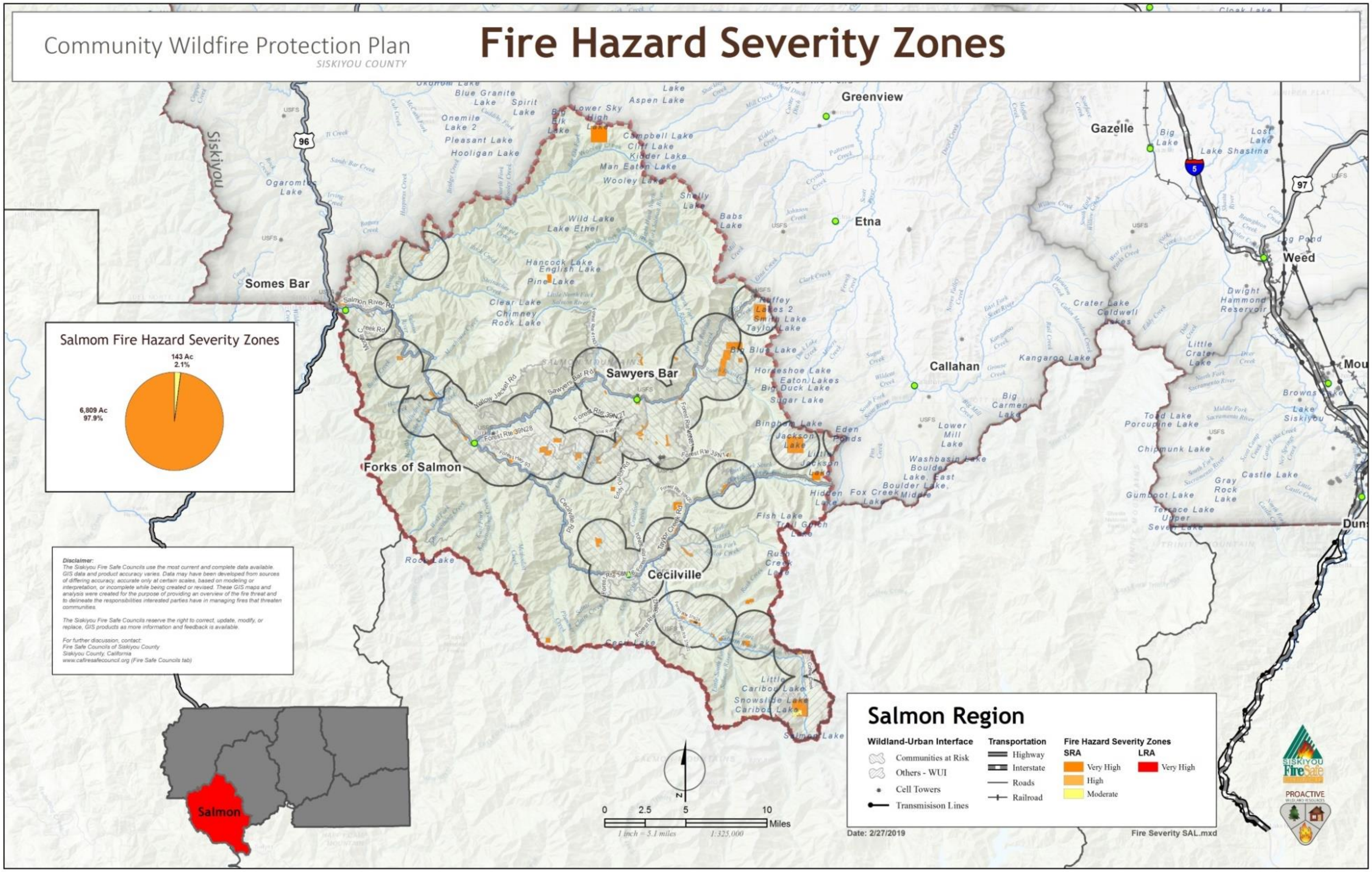
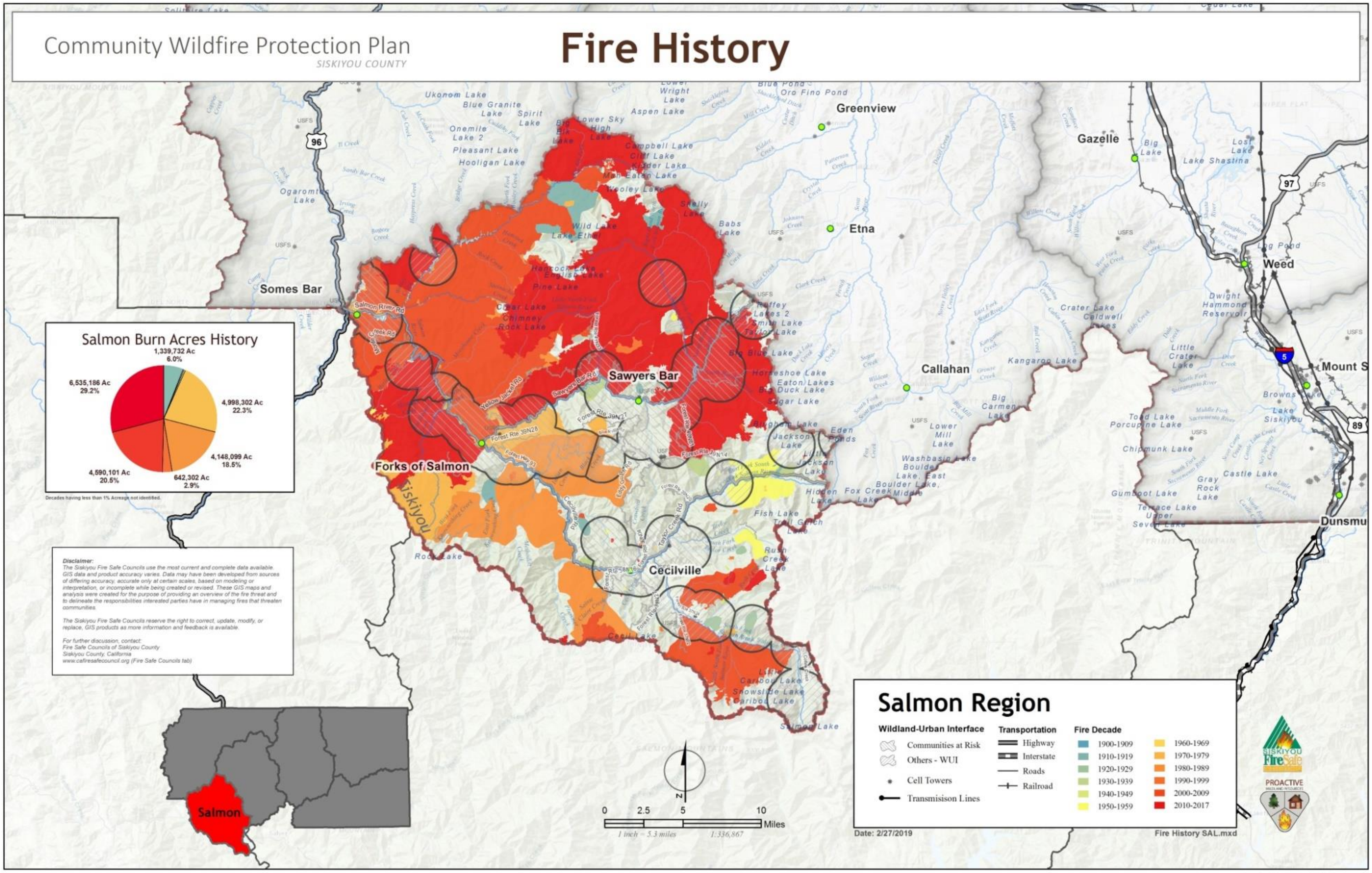
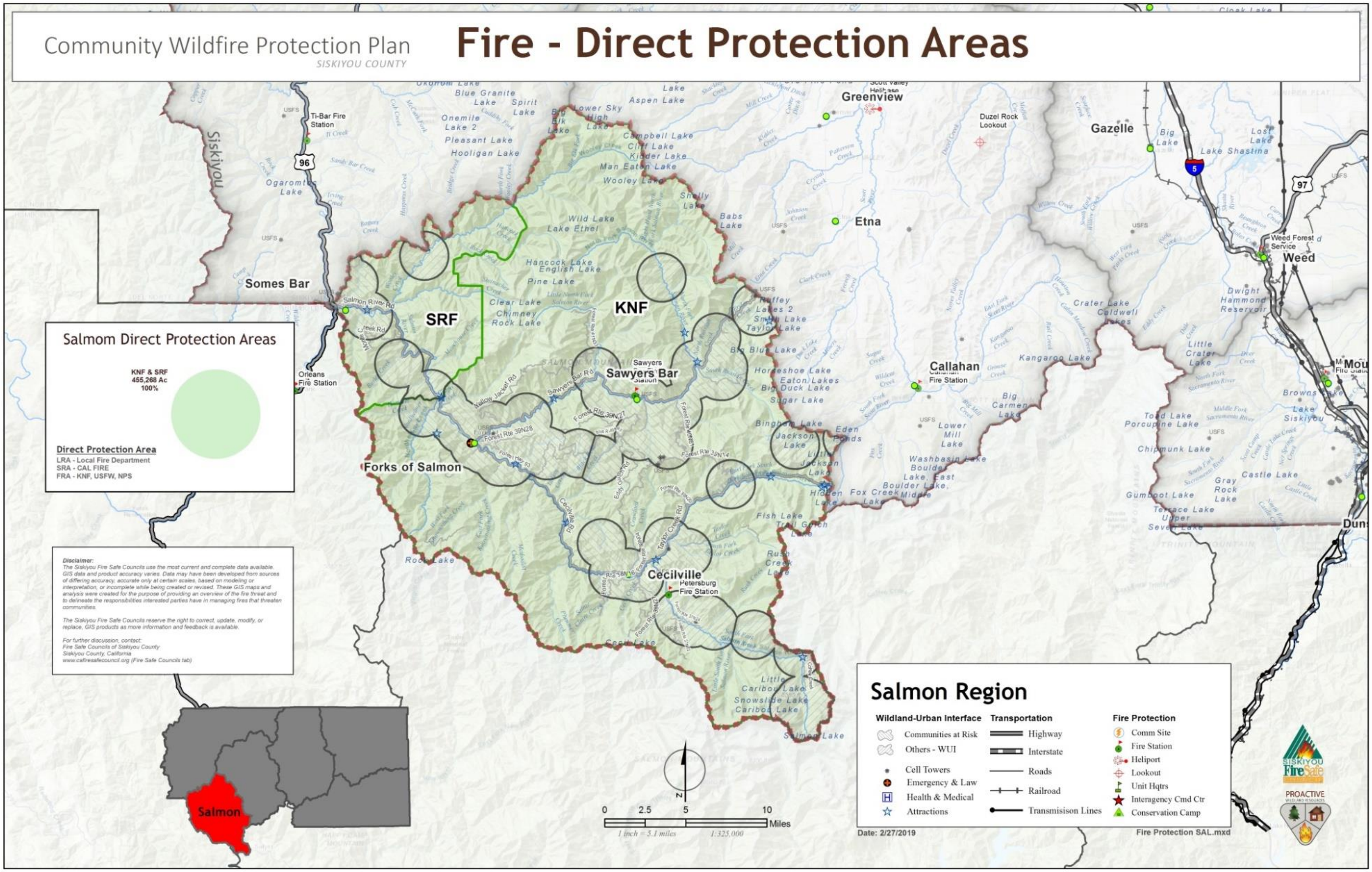


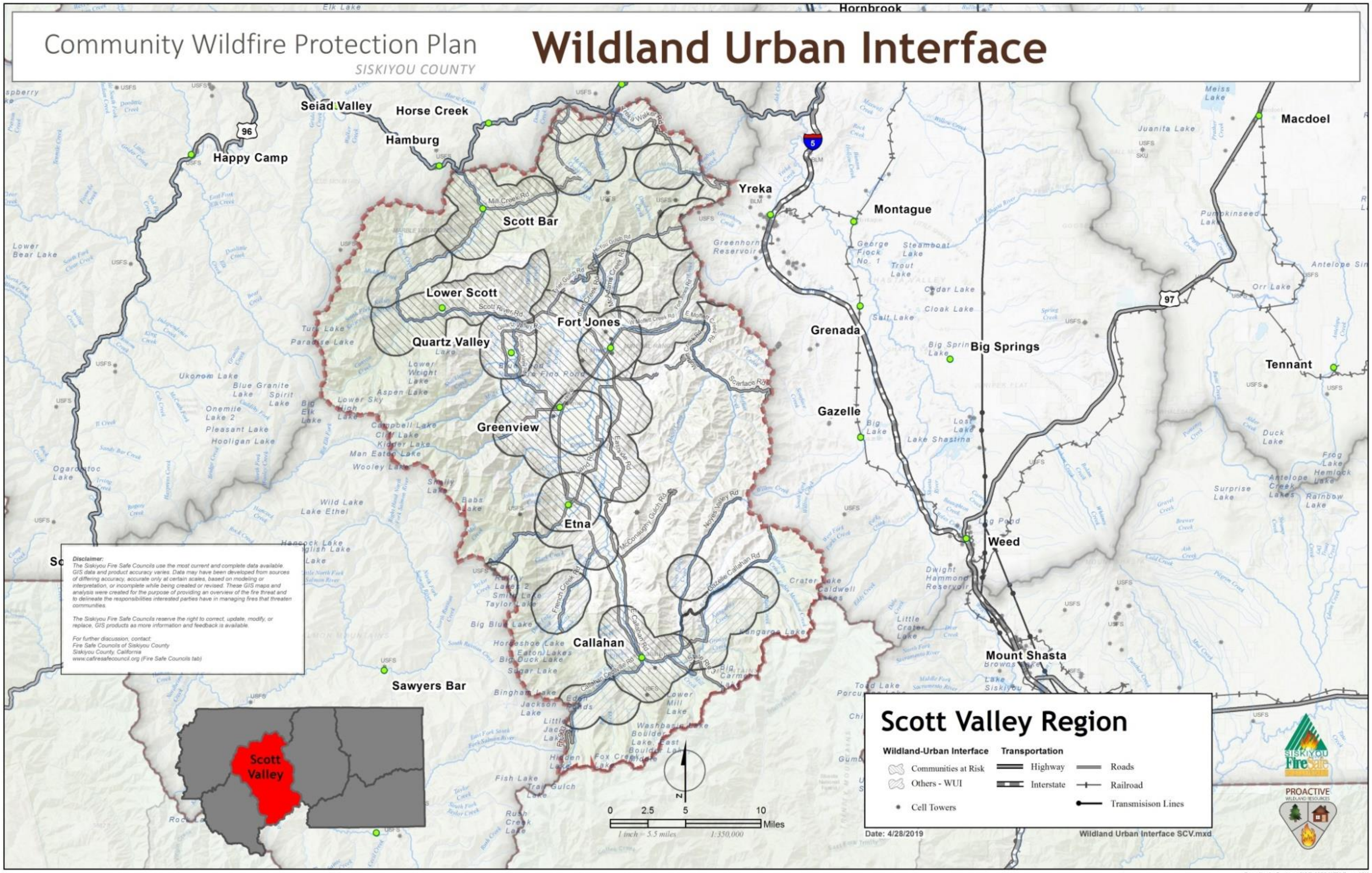
6) Fire History – Salmon PR (depicted by decade 1900-2017)



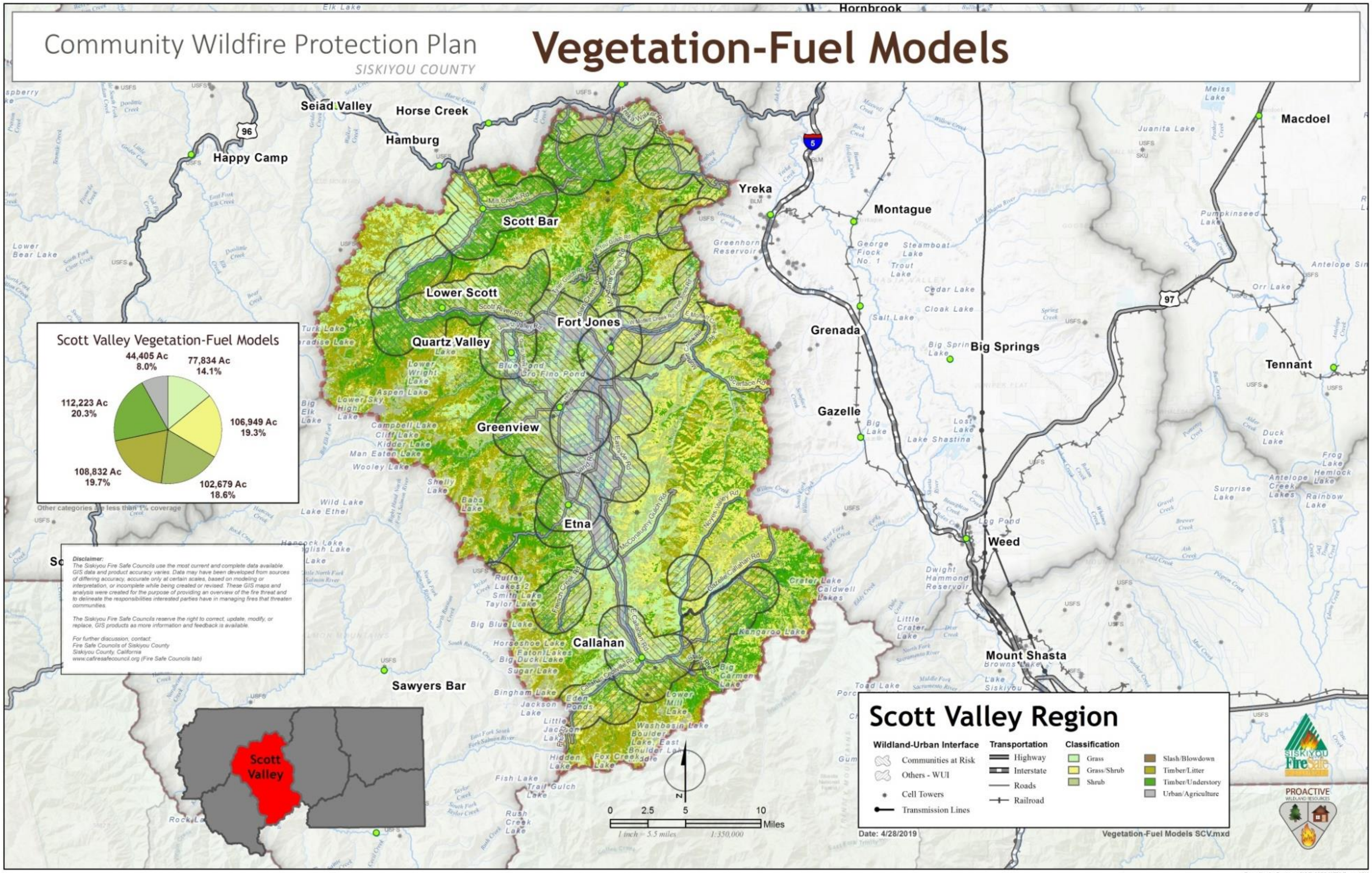
7) Direct Protection Areas – Salmon PR



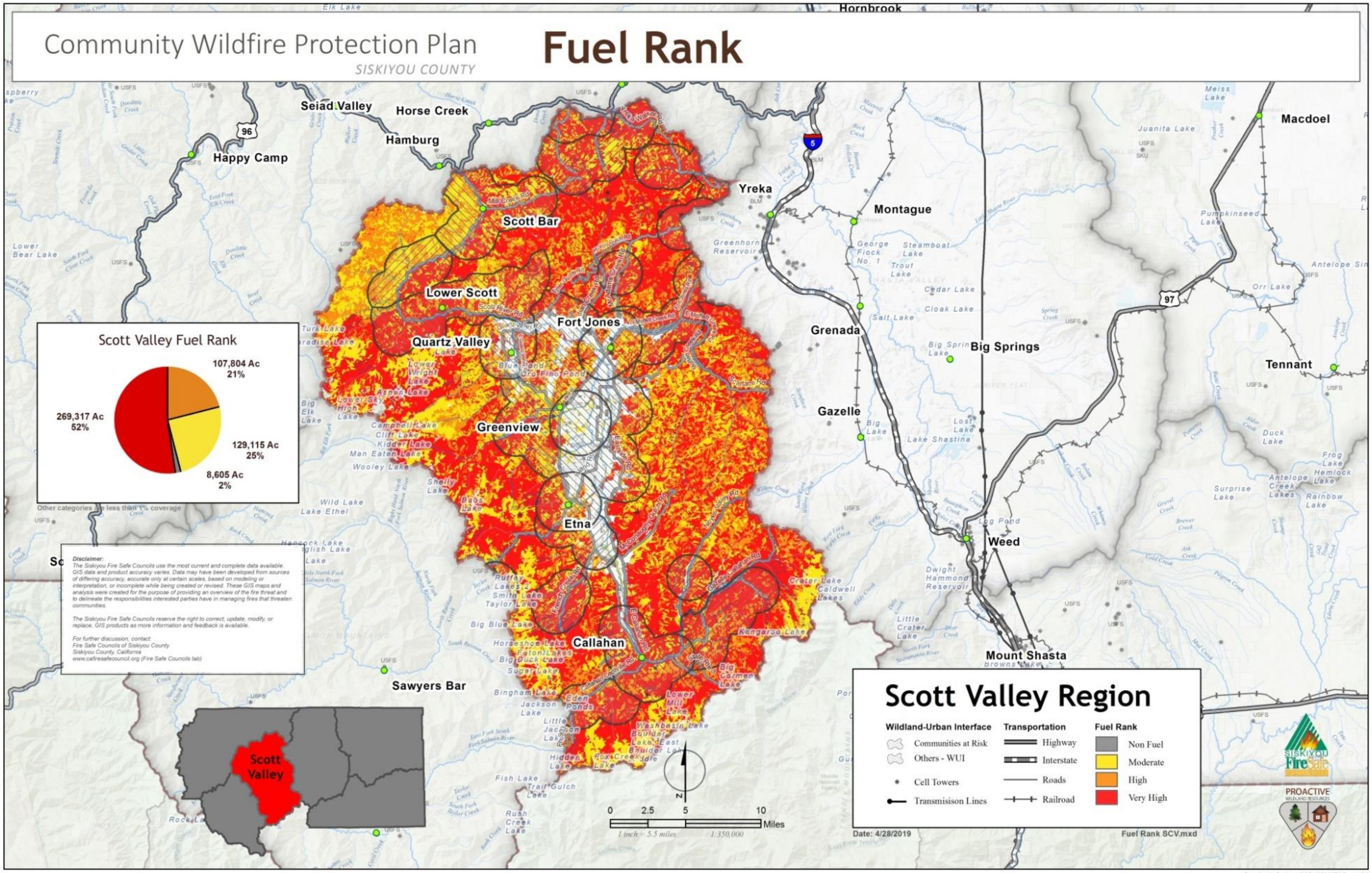
1) Communities At Risk with WUI Boundaries - Scott Valley PR



2) Vegetation Fuel Models - Scott Valley PR



3) Fuel Rank - Scott Valley PR



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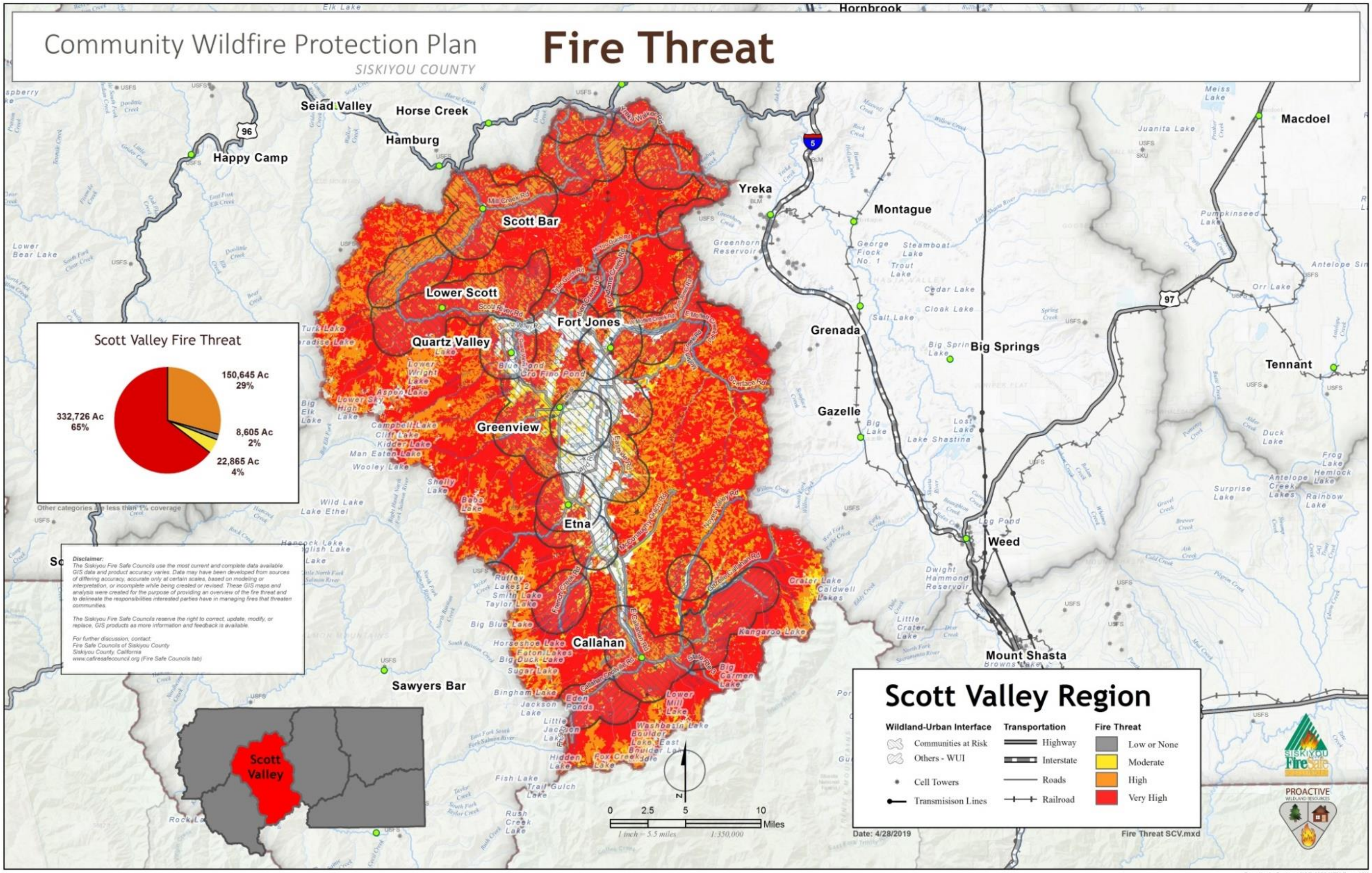
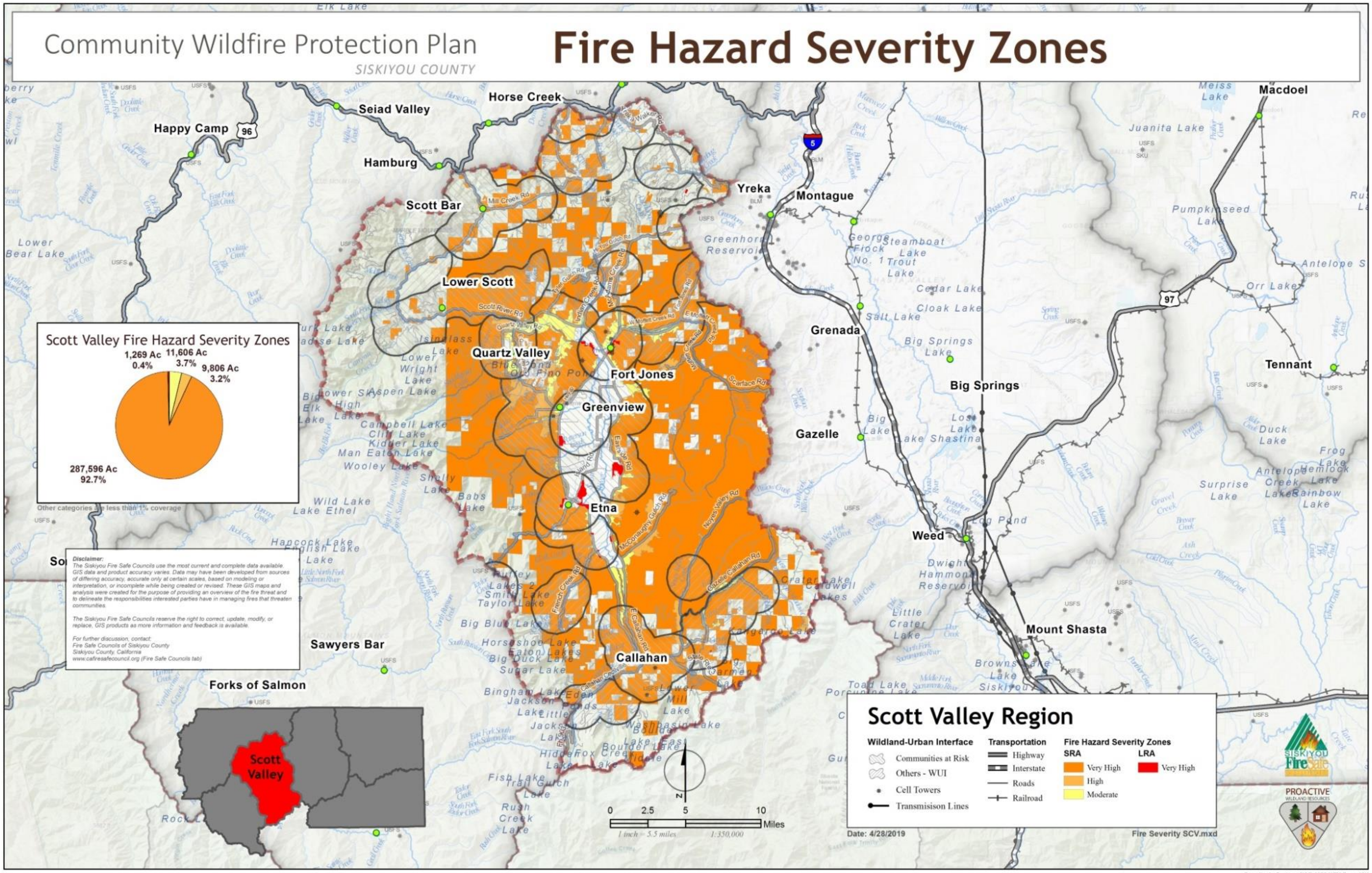
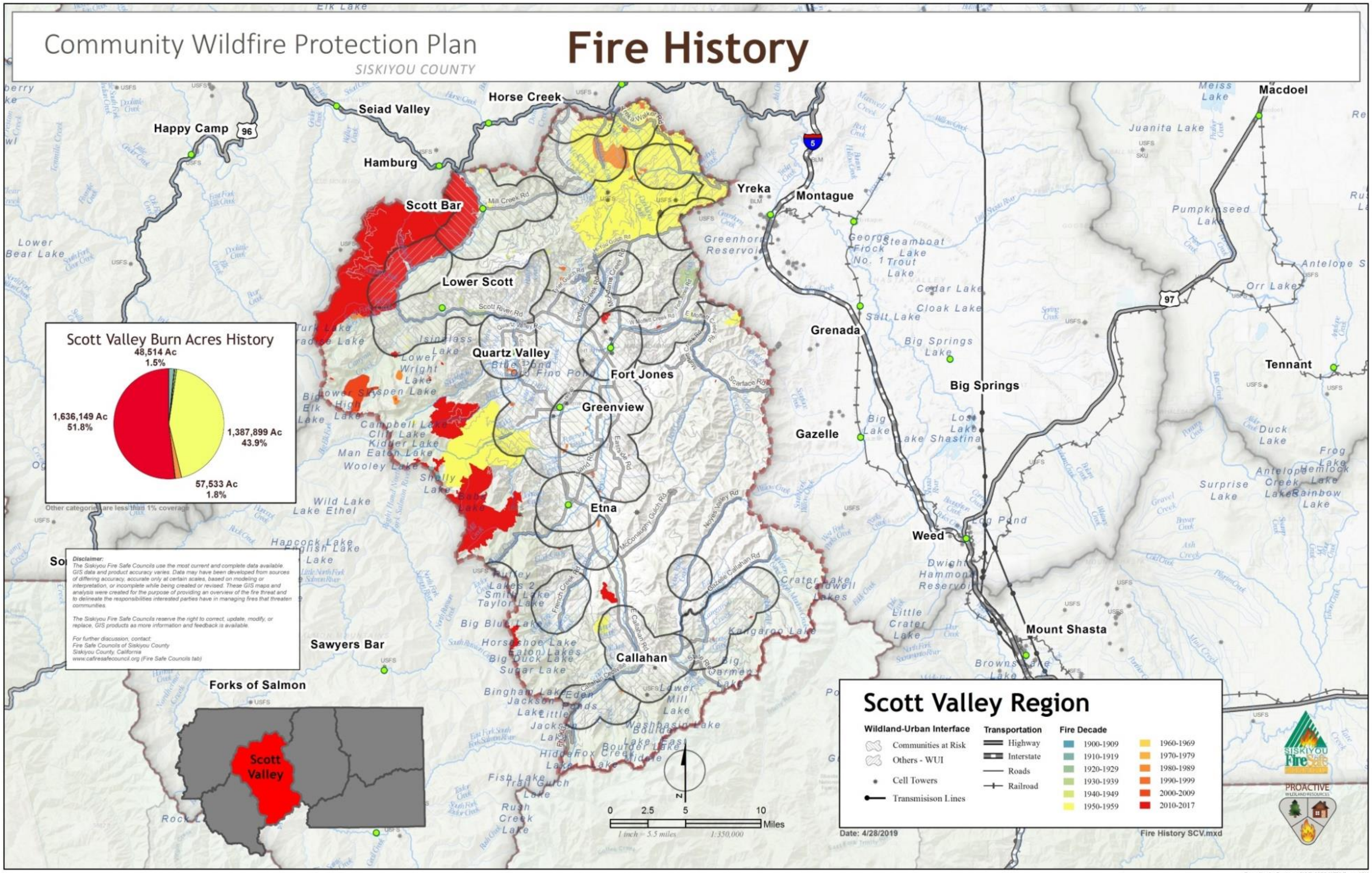


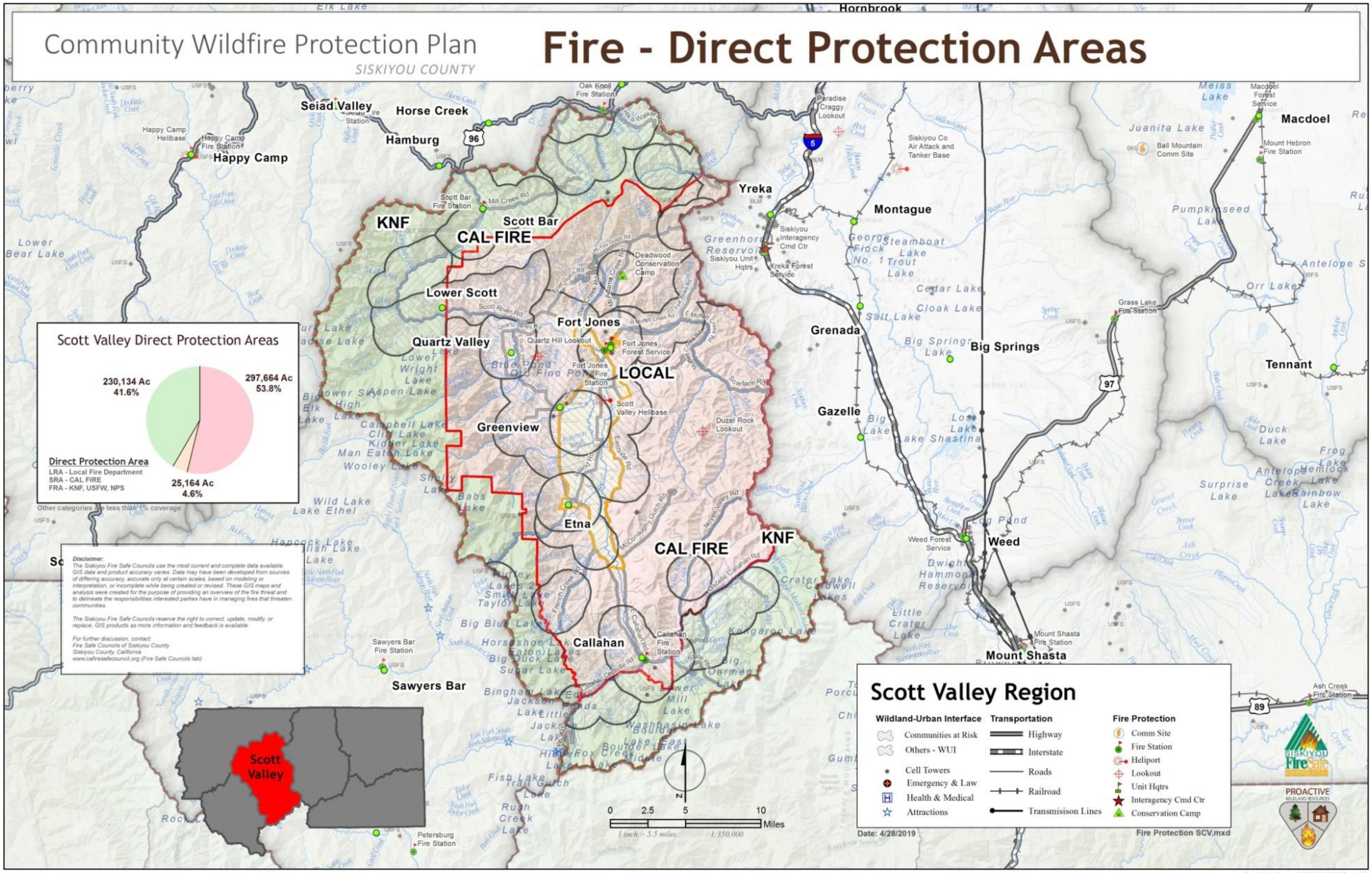
5) Fire Severity – Scott Valley PR



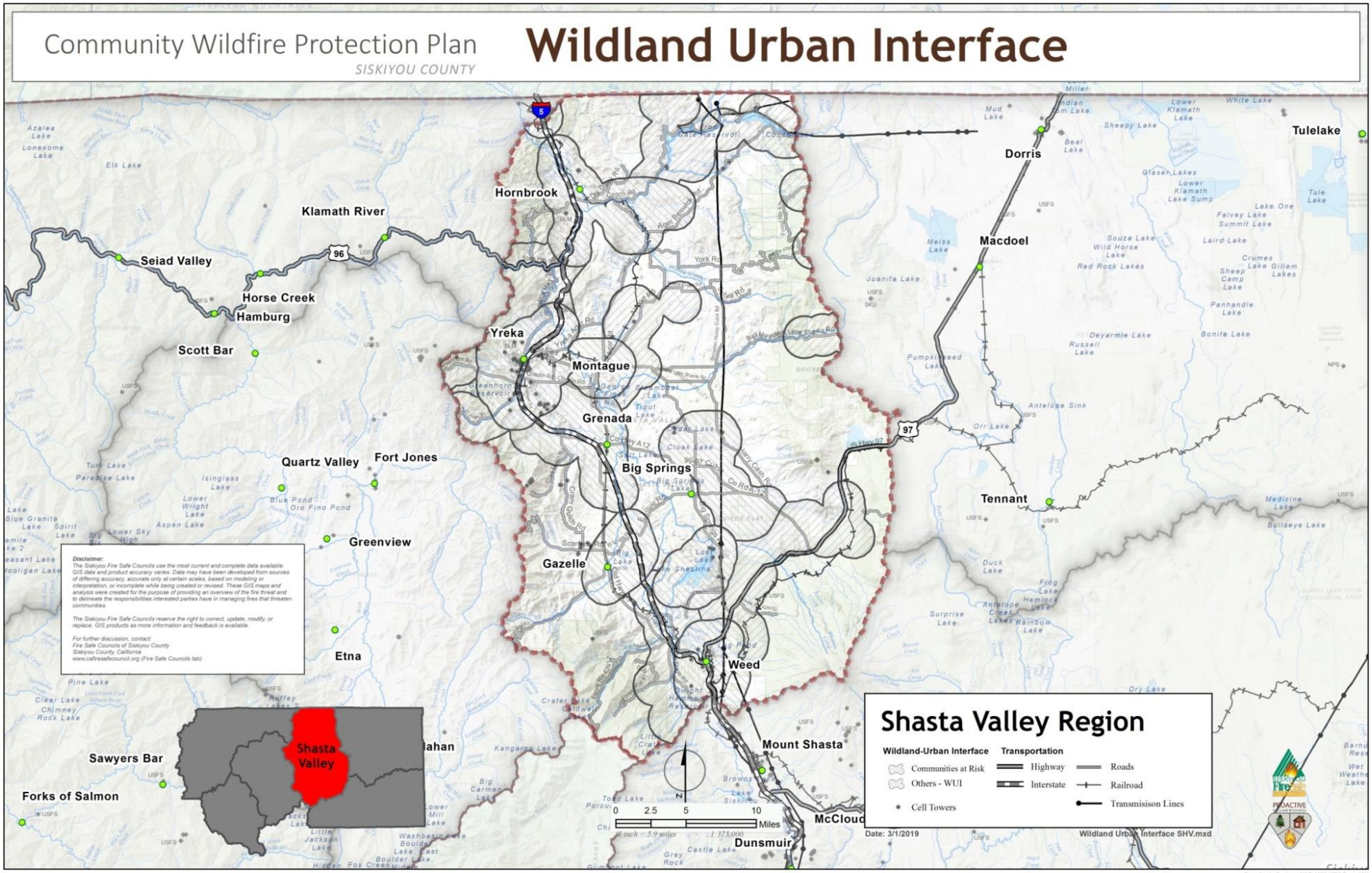
6) Fire History – Scott Valley PR (depicted by decade 1900-2017)



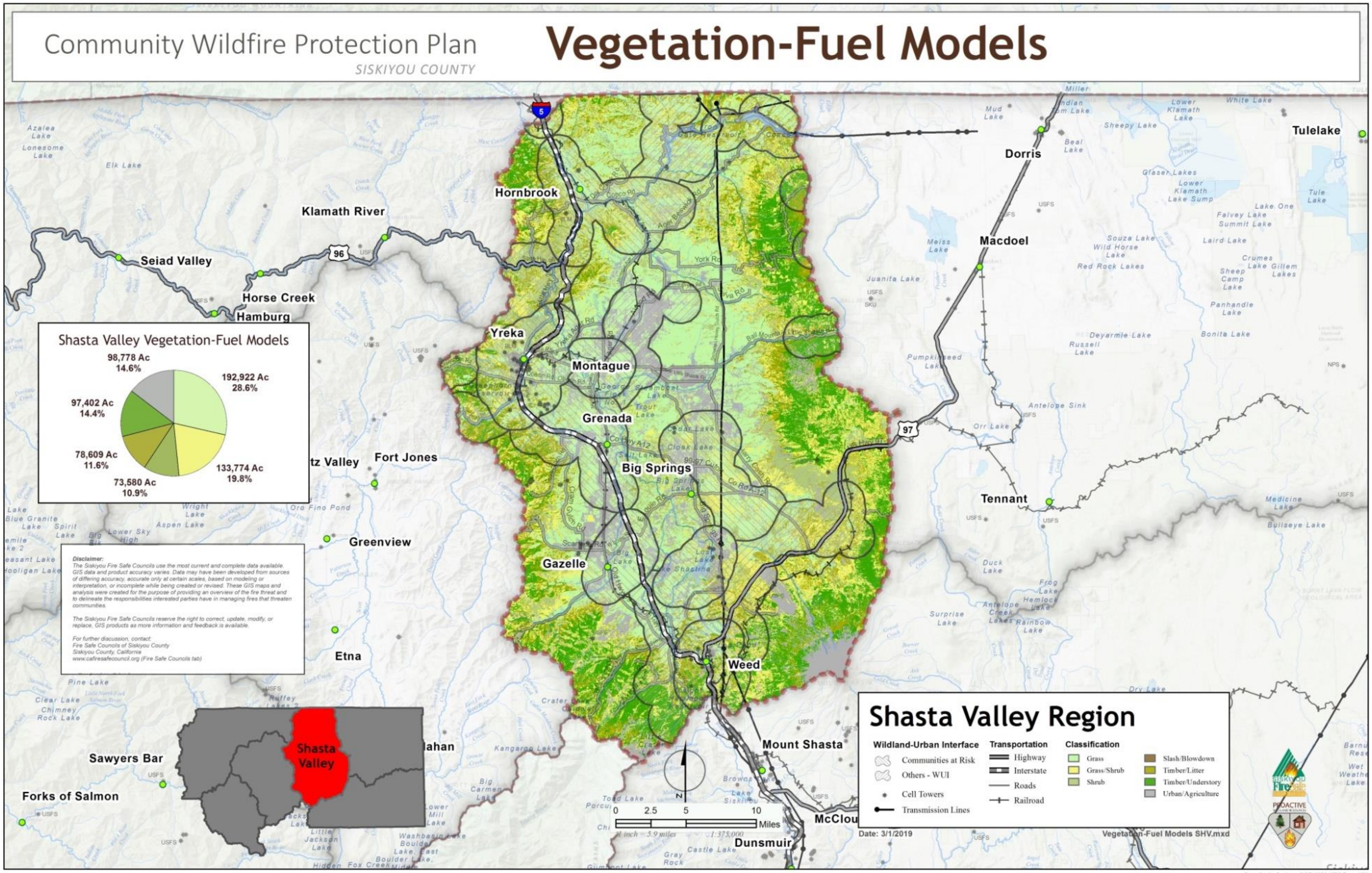
7) Direct Protection Areas – Scott Valley PR



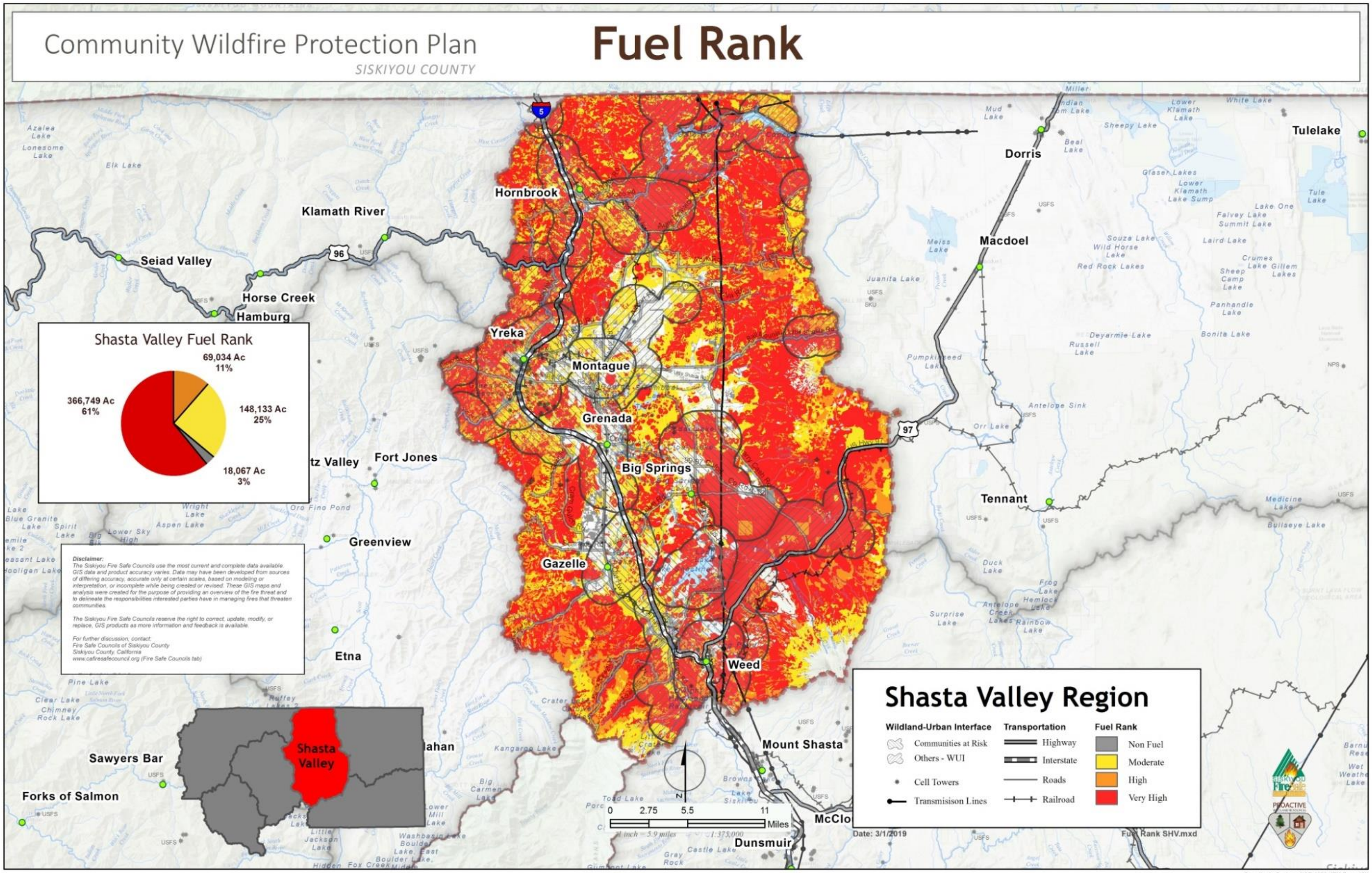
1) **Communities At Risk with WUI Boundaries - Shasta Valley PR**



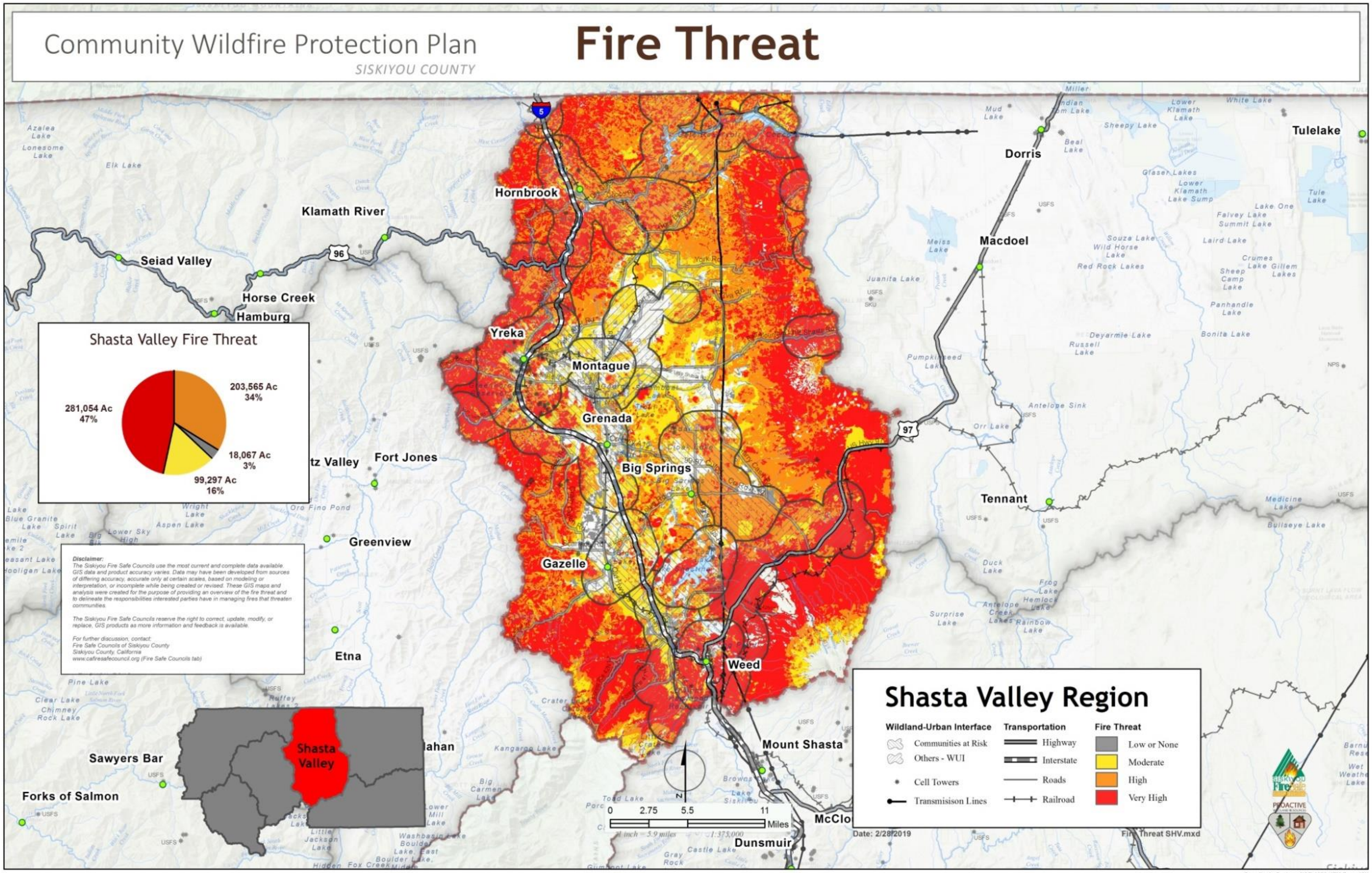
2) **Vegetation Fuel Models - Shasta Valley PR**



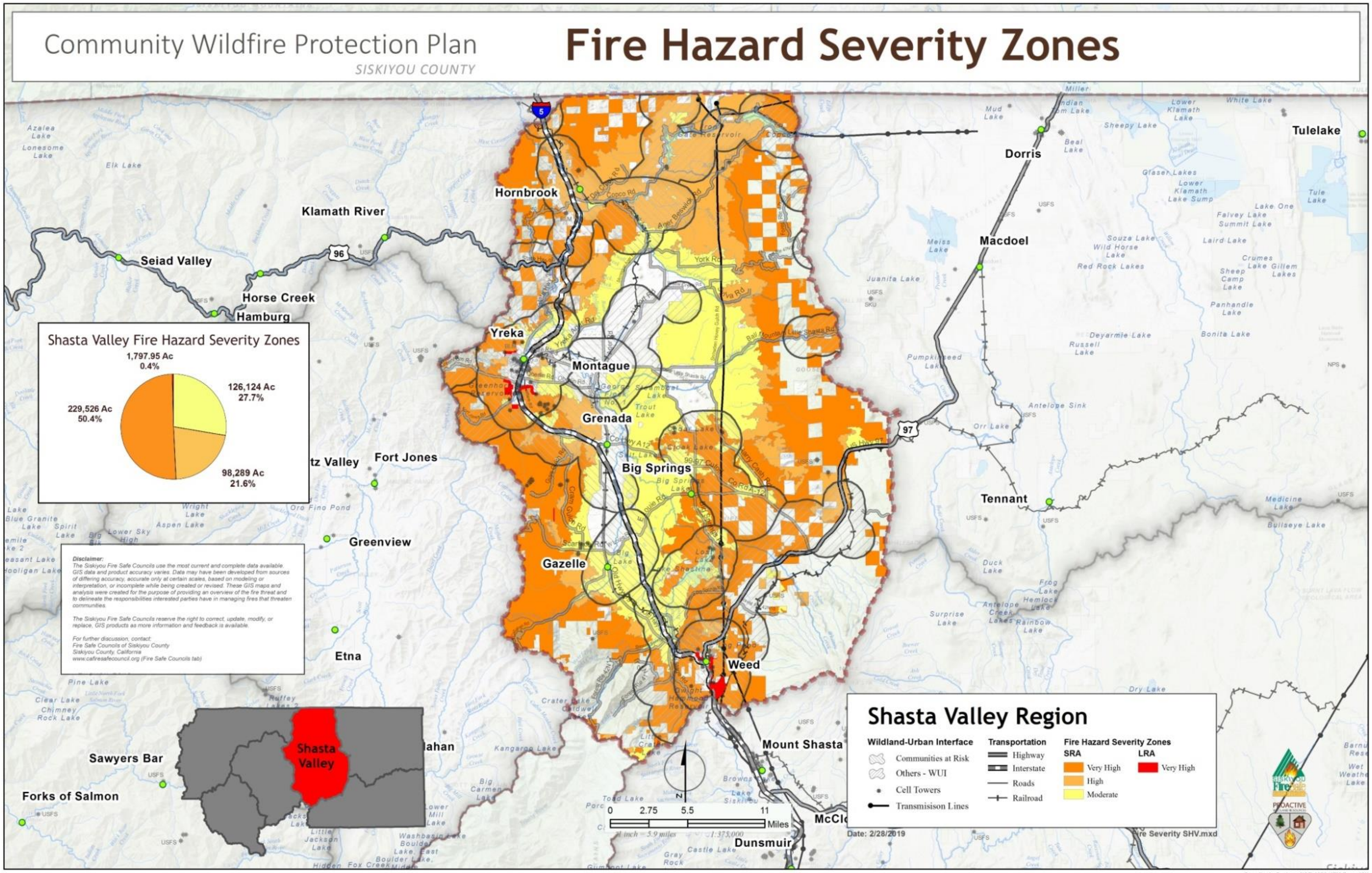
3) Fuel Rank - Shasta Valley PR



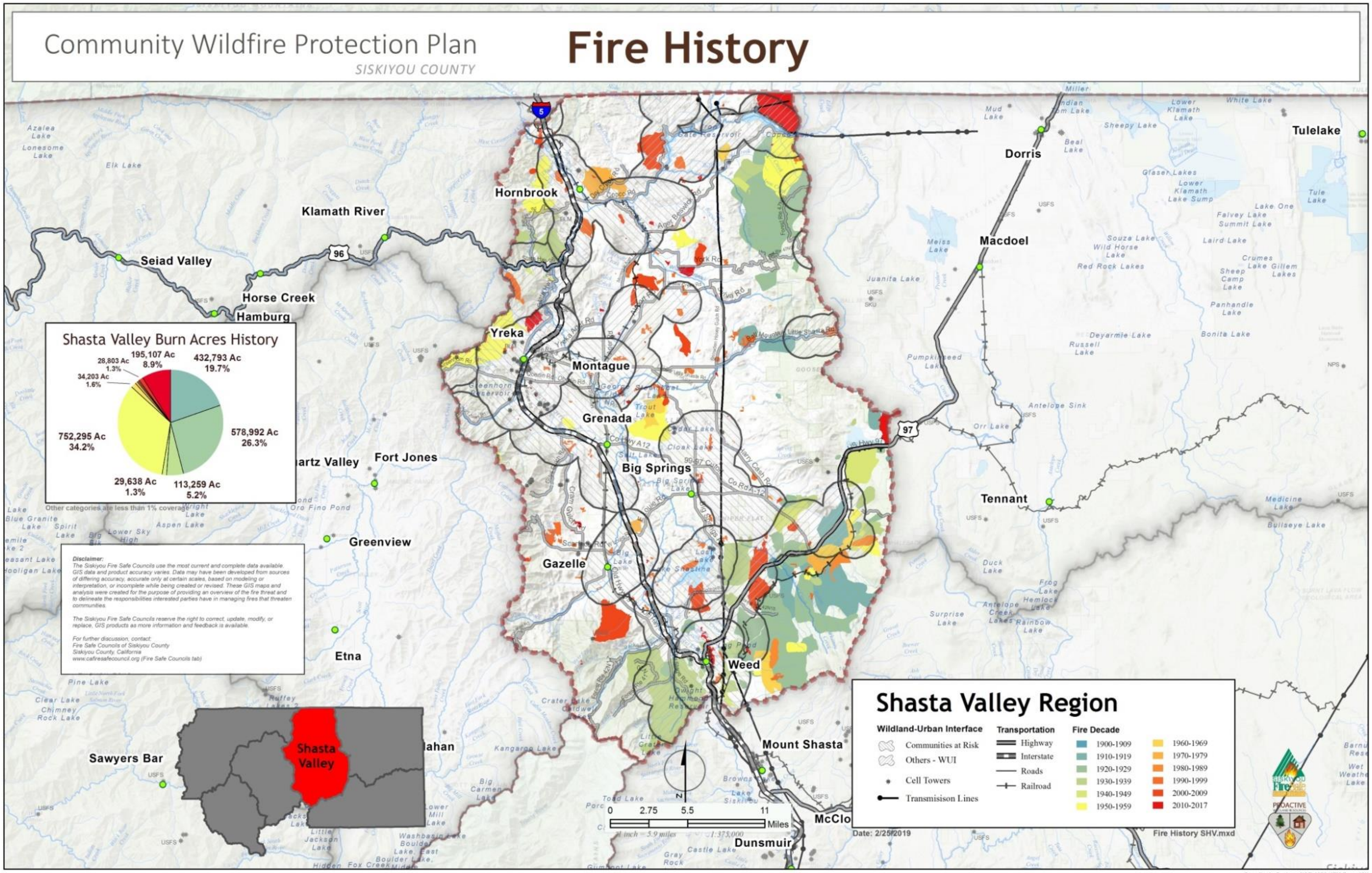
4) Fire Threat - Shasta Valley PR



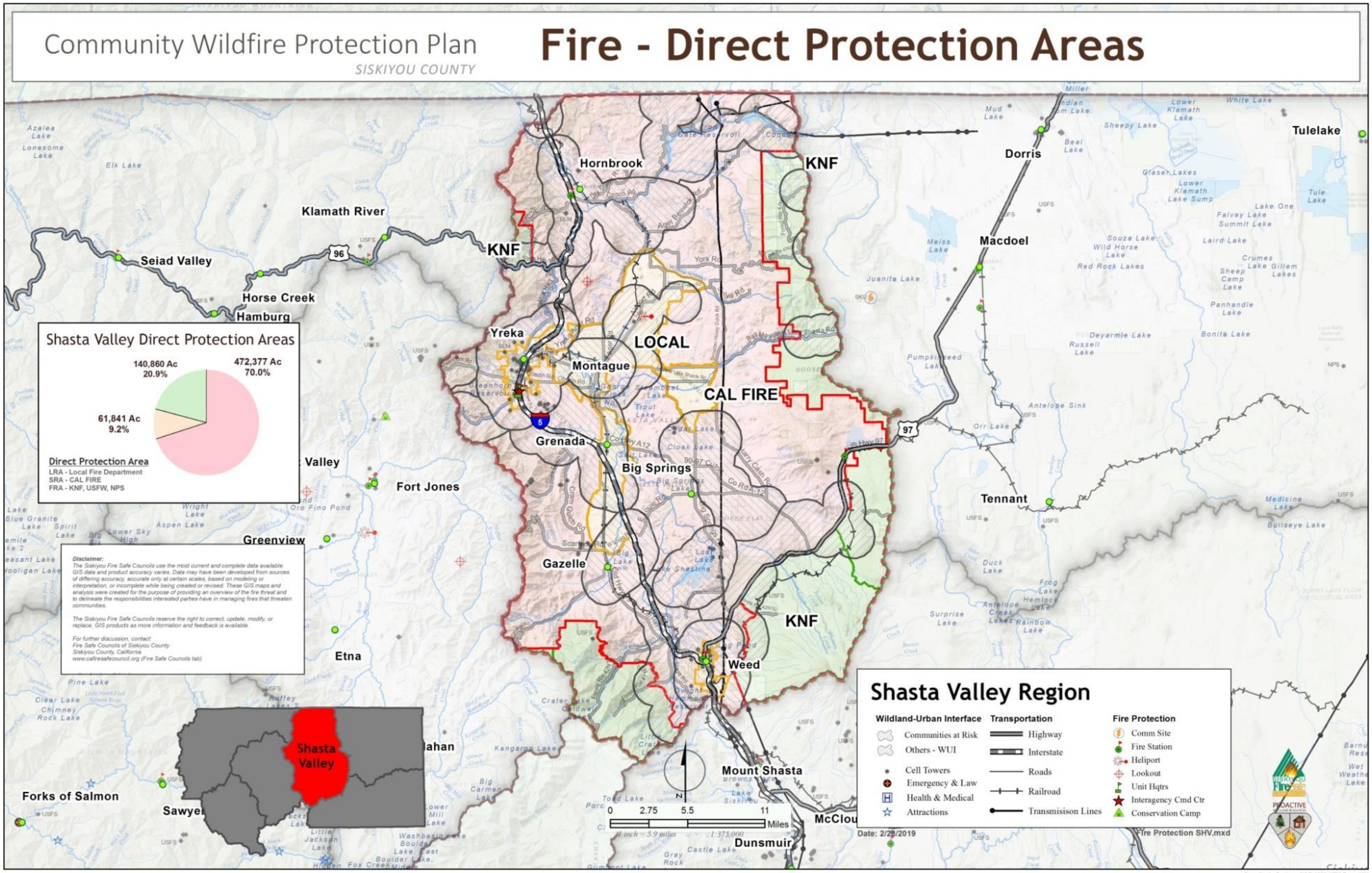
5) **Fire Severity – Shasta Valley PR**



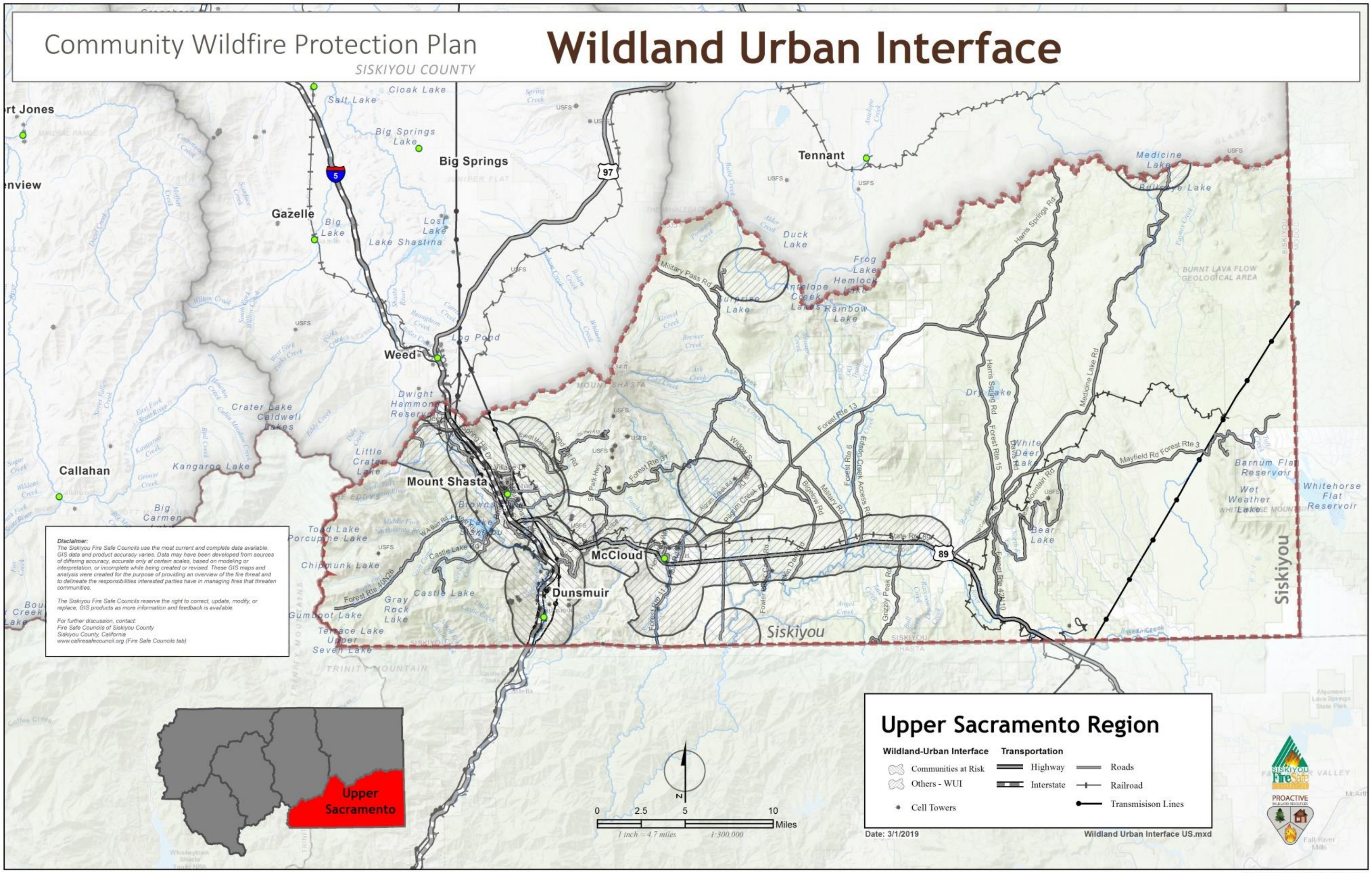
6) **Fire History – Shasta Valley PR (depicted by decade 1900-2017)**


Community Wildfire Protection Plan
SISKIYOU COUNTY
Fire History
Shasta Valley Burn Acres History
195,107 Ac 8.9%
432,793 Ac 19.7%
28,803 Ac 1.3%
34,203 Ac 1.6%
578,992 Ac 26.3%
752,295 Ac 34.2%
29,638 Ac 1.3%
113,259 Ac 5.2%
Other categories are less than 1% coverage
Shasta Valley Region
Wildland-Urban Interface
Communities at Risk
Others - WUI
Cell Towers
Transmisison Lines
Transportation
Highway
Interstate
Roads
Railroad
Fire Decade
1900-1909
1910-1919
1920-1929
1930-1939
1940-1949
1950-1959
1960-1969
1970-1979
1980-1989
1990-1999
2000-2009
2010-2017
Date: 2/25/2019
Fire History SHV.mxd
Coordinate System: NAD 1983 UTM Zone 10N
0 2.75 5.5 11 Miles
Shasta Valley
Tulelake
Dorris
Macdoel
Tennant
Hornbrook
Klamath River
Seiad Valley
Horse Creek
Hamburg
Yreka
Montague
Grenada
Big Springs
Fort Jones
Greenview
Gazelle
Etna
Weed
Mount Shasta
Sawyers Bar
Dunsmuir

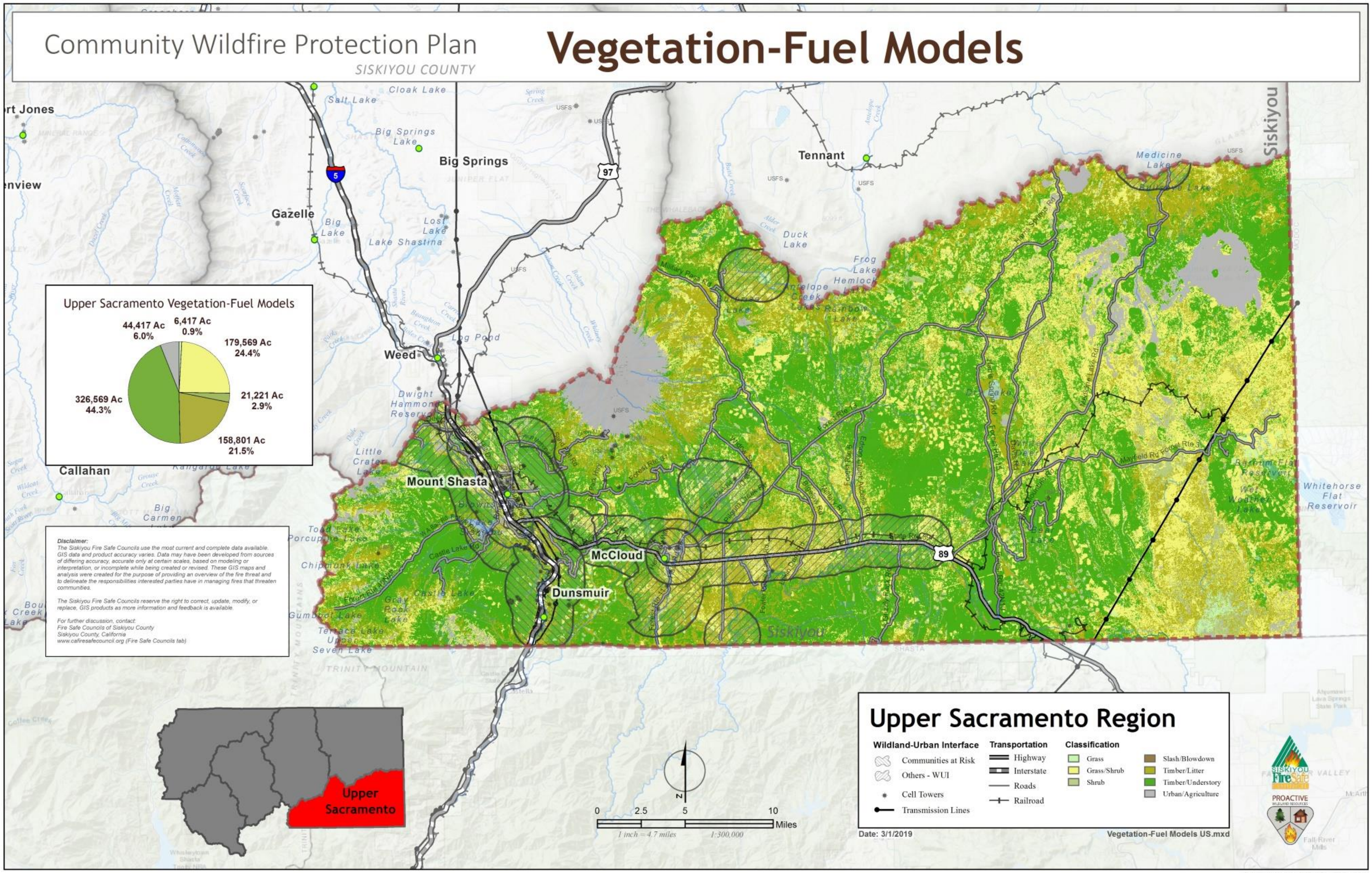
7) Direct Protection Areas – Shasta Valley PR



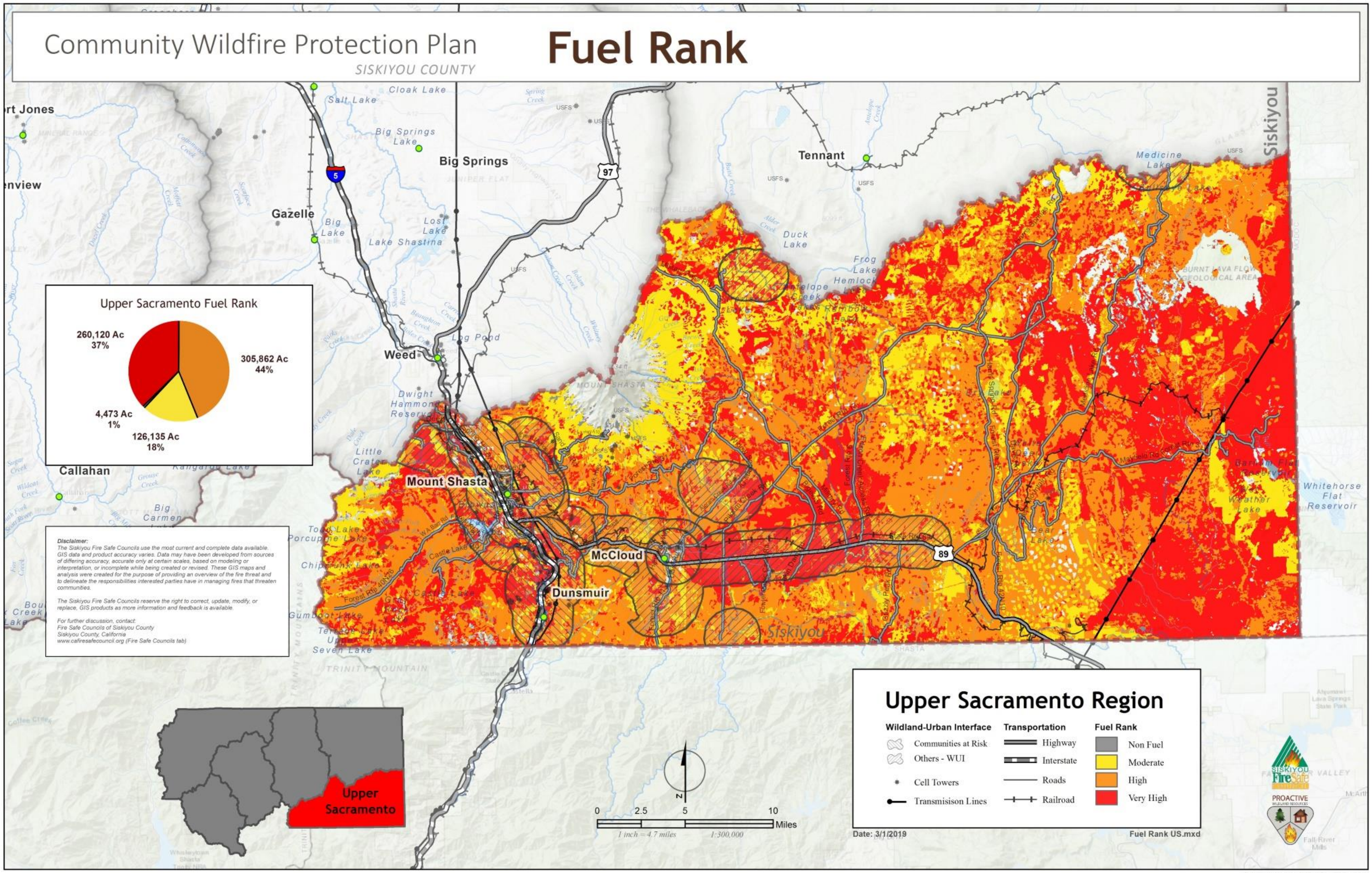
1) Communities At Risk with WUI Boundaries - Upper Sacramento PR



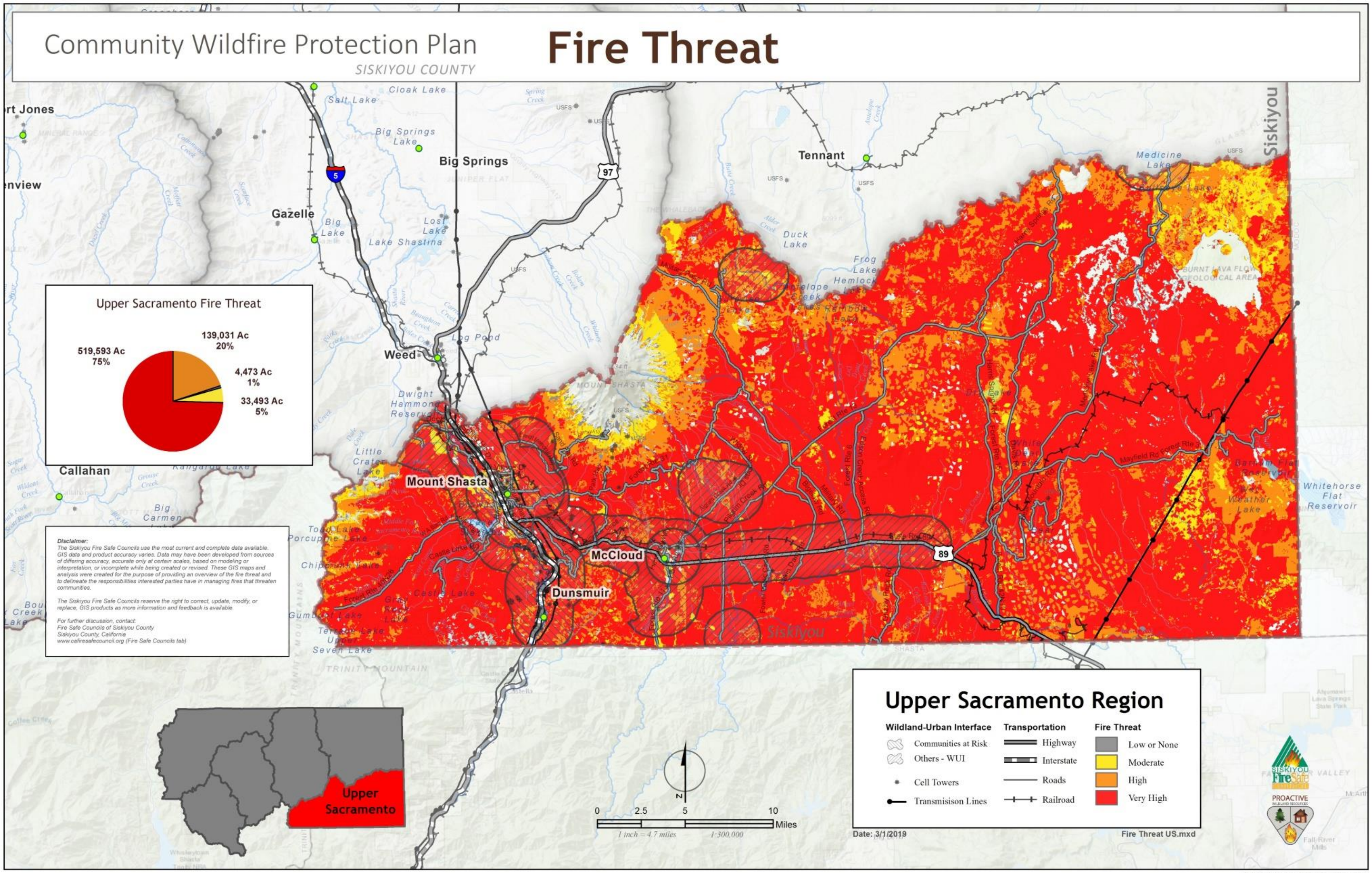
2) Vegetation Fuel Models - Upper Sacramento PR



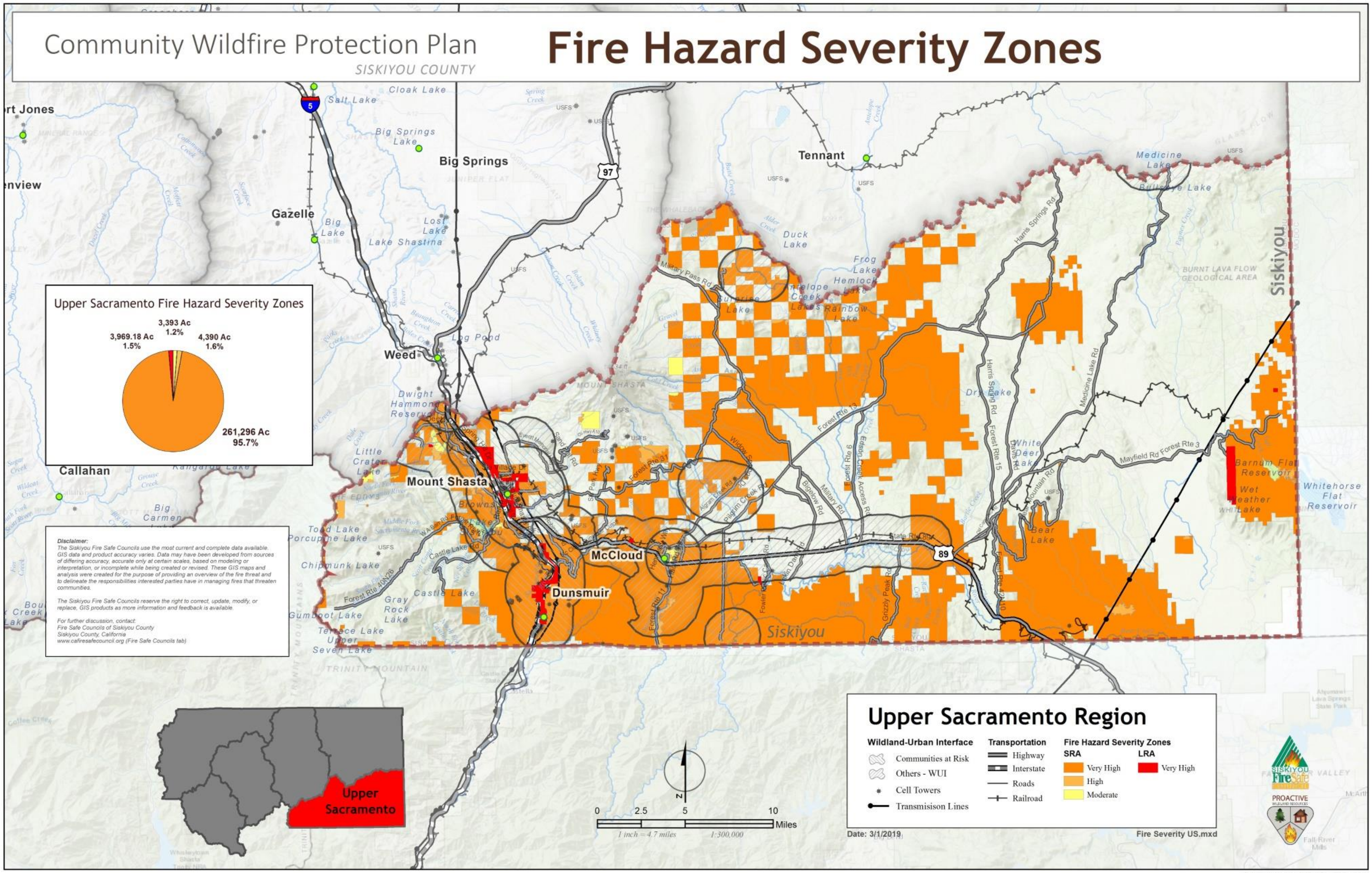
3) Fuel Rank - Upper Sacramento PR



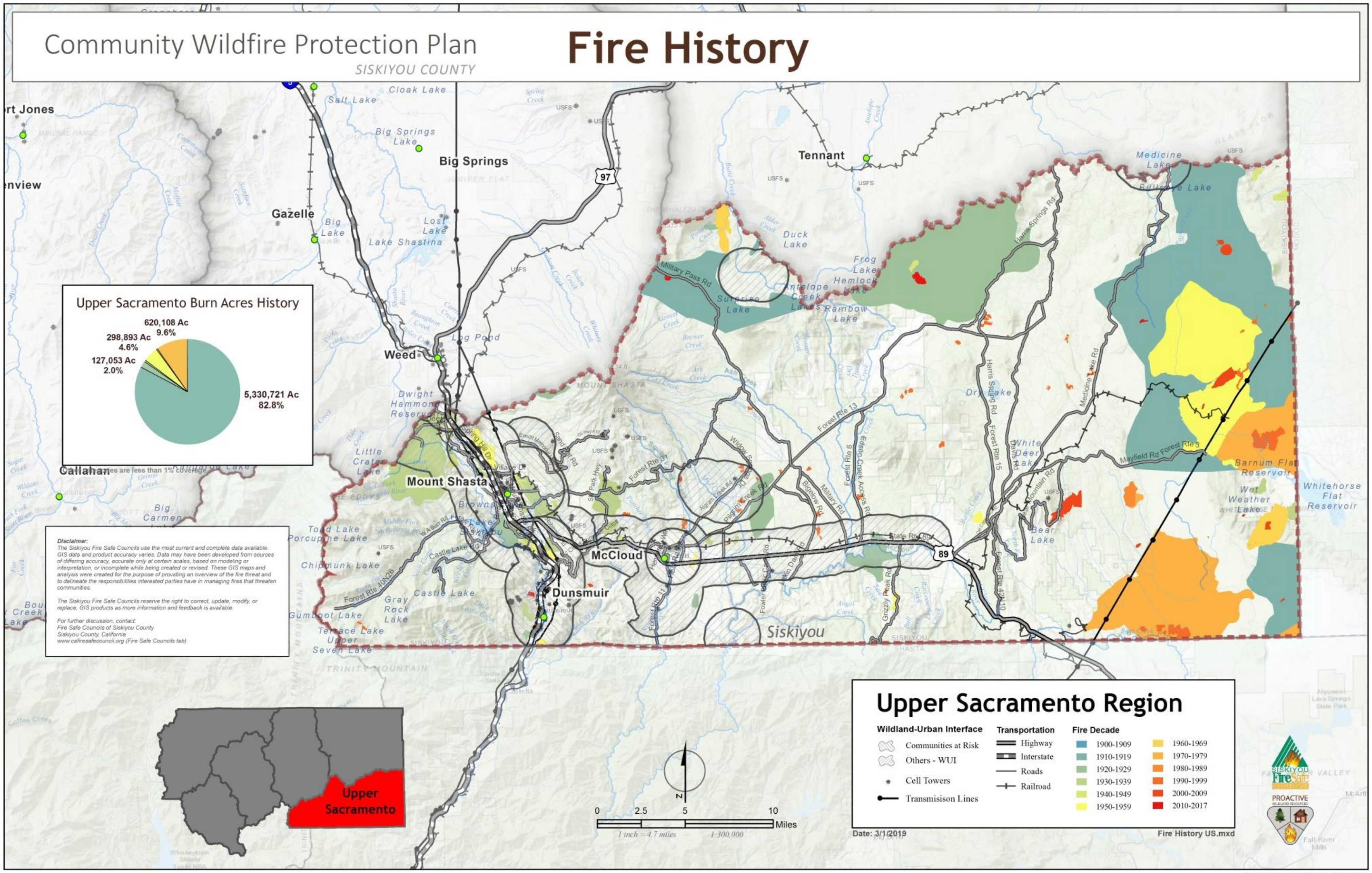
4) **Fire Threat - Upper Sacramento PR**



5) Fire Severity – Upper Sacramento PR



6) Fire History – Upper Sacramento PR (depicted by decade 1900-2017)



7) Direct Protection Areas – Scott Valley PR