Community Wildfire Protection Plan
Yreka Area

Badger Fire | July 2020

Yreka Area View of Mt Shasta

Klamathon Fire | September 2018

July 2021

MUTUAL AGREEMENT PAGE

This Community Wildfire Protection Plan (CWPP) for the Greater Yreka Area, California:

- ✓ 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 the Greater Yreka Area.
- ✓ 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 the Greater Yreka Area.
- ✓ 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: George J Jennings 7-29-2021
George Jennings, President
Yreka Area Fire Safe Council

Recommended by: 7-29-2021
Bernie Paul, Chief, South Yreka Fire Protection District and President
Siskiyou County Fire Chiefs Association

Recommended by: 7-20-2021
Jerry Lemos, Chief, Yreka Fire Department

Recommended by: 7-20-2021
Duane Kegg, Mayor
City of Yreka

Approved by: 7/29/2021
Phillip R. Anzo, Unit Chief
CAL FIRE Siskiyou

ACKNOWLEDGEMENTS

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

Yreka Area Residents
Due to coronavirus pandemic community members primarily contributed input online or via email

Yreka City Leadership
- City Mayor and City Manager Support

Yreka Area Fire Safe Council
- Member support and collaboration

Fire Safe Council of Siskiyou County
- Reference source for online countywide CWPP

County of Siskiyou Leadership
- County Office of Emergency Services

Siskiyou County Fire Chief's Association
- President, Fire Chief Association

Yreka Fire Department
- Chief and Executive Committee

South Yreka Fire Department
- Chief and Board of Directors

CAL FIRE
Siskiyou Unit CAL FIRE personnel were active participants Representation included:
- Unit Chief and Assistant Chief
- Unit Battalion Chief
- Unit Prevention Officers

Klamath National Forest
All Forest personnel who participated in workshops and assisted in plan development stages, including:
- Forest Leadership staff
- Forest Fire Ecologist

Community Meetings and Workshop Hosts
- CAL FIRE Siskiyou Unit Headquarters, Yreka, CA
- South Yreka Fire Department

Northern California Resource Center
- Leadership and Project Management Representatives

Consultant/Support
- Geo Elements LLC

PROACTIVE Wildland Resources
- Project Team

PLAN OVERVIEW

This CWPP is a product of collaboration among citizens across the Yreka Area and serves as a guide with tools to help prepare and protect local communities for wildfire impacts. Current information is imperative as California faces ongoing, unprecedented loss of life, property and natural resources to wildfire. The Yreka Area Fire Safe Council (YAFSC) has been central to project initiation and leadership, with funding support from CAL FIRE and Northern California Resource Center grants. Cooperative work includes communication amongst local and state fire departments, the local fire safe council, city leadership, and general public.

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

1. Developed collaboratively
2. Identifies and prioritizes areas for hazardous fuel reduction treatments
3. Recommends treatments to reduce structure ignitability

- Part I: Core Sections. Address general elements for the entire CWPP. An overview of the plan organization is as follows:

  Sections 1-5:

  - Introduction, purpose, objectives, collaborative process
  - Local policy *(includes reference to State, Federal policy)*
  - Yreka Area background *(including Communities at Risk)*
  - Wildfire situation: ecology, climate, fire history, wildfire environment
  - Wildfire science/assessment

  Sections 6-8:

  - Action plans (preparedness, strategy, mitigation actions, implementation tools)
  - Potential funding resources
  - Monitoring programs

- Part II: Planning Areas. Convey wildfire assessment and analysis (from Section 5) into ten succinct divisions, providing tools at a scale to better support local efforts and/or CWPP development.

- Part III: Appendices.

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PART I. Core Sections

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SECTION 1. INTRODUCTION

This Community Wildfire Protection Plan (CWPP) conveys a wildfire assessment to achieve a common goal of expanding community wildfire resilience for life, safety and value protection. The Yreka Area Fire Safe Council initiated this update of the initial 2013 plan, with support from the Northern California Resource Center (NCRC) and CAL FIRE. It provides extensive new data and information, including an increased scope of geographic and administrative coverage. As a science-based platform, this CWPP provides foundational guidance for the Yreka Area's wildfire planning, education, mitigation and implementation strategy and actions. Cooperative work by all citizens to accomplish adaptive measures that minimize potential wildfire hazard will progressively increase survivability factors in the Yreka Area Wildland Urban Interface (WUI) setting.

2020 was historic in California's wildfire history, marked by the most acreage ever burned in the state in a single wildfire season. This occurred just two years after the devastating 2018 wildfire season, the deadliest in state history. In mid-July of 2020, in the Yreka Area, the Badger Fire threatened thousands of residents as it moved down the slopes and into the outskirts of towns.

Badger Fire, July 19, 2020
Wildfire Today, CALFIRE Photo

The significant increase in wildfire incident size and complexity over the past several years has been accompanied by catastrophic damage including loss of life, structures, infrastructure, and natural resources. Factoring recent fire severity data, climate trends, and ecosystem changes, we know the question is not **if** a wildfire will burn, but **when** it will burn.

This plan fulfills an important role to better position Yreka Area communities in wildfire education, mitigation actions, and the ability to acquire potential grants as well as other funding sources.

1.1 PURPOSE OF THE PLAN

External Links

This CWPP contains links to numerous websites and additional resources. When you see blue underlined text, it indicates a clickable link. All links were current as of the CWPP publication date.

The primary purpose of this CWPP is to provide guidance that enhances protection of human life and helps Yreka Area communities become more resilient to wildfire. It is a resource to guide future actions by all citizens. It provides 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.

Wildfire science and data provided in this CWPP will effectively help identify vulnerable and/or high-hazard areas, which is important in wildfire protection grant application processes.

1.2 GOALS AND OBJECTIVES

Table 1 summarizes the key goals and objectives of this CWPP that 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	• Identify specific areas with the greatest wildfire threat • Evaluate wildfire protection capabilities and safe evacuation needs • Develop guidelines and mitigation strategies to reduce threats to life and property
Educate the public about wildfire threats and fire prevention measures	• Increase knowledge of existing policy, regulations and guidelines that address wildfire hazard or threat • Identify opportunities for property owners to receive on-site education as it pertains to pre-fire prevention planning and living in the WUI • Increase awareness of the public disaster readiness resources of CAL FIRE's "Ready for Wildfire" and California's Office of Emergency Services (OES) "Listos" campaigns
Improve fire safety by reducing excessive fuel loads and fire hazards	• Identify strategies that reduce structure vulnerability through assessment of potential damage/loss from burning embers and a flaming fire front • Evaluate safety requirements of ingress and egress routes throughout the area for incorporation into existing and future fuel treatment activities • Identify and prioritize hazard mitigation strategies and hazardous fuel reduction activities that enhance protection of values
Promote healthy forest landscapes, providing for improved water and air quality	• Implement mitigation strategies that consider visual, resource and environmental quality • Ensure mitigation activities follow best management practices regarding natural and historic resources • Ensure the CWPP meets or exceeds the requirements of the Healthy Forests Restoration Act of 2003 and addresses the importance of concerted actions regarding the increasingly problematic tree mortality issue
Facilitate knowledge of national, state and county level fire plans	• Provide information resources to enable citizens' access to the latest plans and policies at all levels • Identify grant funding sources for 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)) provides flexibility for communities to determine the substance and detail of their planning.

The CWPP planning process brings together 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.

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

1. *Collaboration.* A CWPP must be collaboratively developed. Various administrators and officials from fire protection agencies as well as other interested parties should be involved.
2. *Prioritized Fuel Reduction.* A CWPP must identify and guide prioritization of areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that reduce wildfire risk.
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 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

For the Yreka Area, final approval of any Community Wildfire Protection Plan rests with the CAL FIRE Unit Chief of Siskiyou.

1.3.1 Public Outreach

Due to Covid-19 safety concerns and restrictions, conducting the standard set of public workshops and meeting forums for this CWPP was not possible. Pre-pandemic, there had been public outreach at meetings with the South Yreka and Yreka Fire Departments as well as two presentations to the Yreka City Council. The onset of the pandemic brought a rapid close to public meetings. Project information and a public input announcement were printed in local press (Siskiyou Daily News) on December 9, 2020 and posted on the YAFSC website. This statement referenced the possibility of "virtual" (Zoom) workshop(s) to be announced depending on the level of interest generated by the press release. Additional outreach included since that point was via Facebook, email, and targeted small gatherings.

The CWPP was discussed at the following meetings:

Collaborative Meeting Dates and Locations

- December 2019: South Yreka Fire Protection District, Board of Directors
- December 2019: Yreka Fire Department, General Meeting, Executive Committee
- December 2019: January 2020, Yreka City Council CWPP presentation.
- February 2020: Fire Safe Council of Siskiyou County, Klamath National Forest HQ
- February 2021: Interagency meeting at CAL FIRE HQ, Yreka
- March 2021: Interagency and Resource agency projects and grants overview meeting, Yreka Fire Department

1.3.2 Interagency Collaborative Approach

A primary aspect in the development of this CWPP was to include and engage Yreka area wildfire emergency responder agencies. This approach was designed to share information and broaden the range of inputs. Participation included representation from:

- Local fire departments
- CAL FIRE
- USFS - Klamath National Forest
- Siskiyou County OES (Office of Emergency Services)
- Listos California
- Northern California Resource Center

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 on the Northern California Resource Center website on May 19, 2021 for a two-week public review period. Comments were considered and incorporated where appropriate.

1.3.4 Fire Safe Council Role

The Yreka Area Fire Safe Council (YAFSC) was formed in 2006 by property owners interested in protecting their properties and the surrounding area from catastrophic wildfire. YAFSC is a small community-based group, organized to improve the Yreka Area's resilience and reduce overall vulnerability to wildfire by providing wildfire education programs, project support and planning (more information is at the YAFSC website). They work closely with local fire agencies and coordinate with community citizens to develop and implement wildfire protection priorities.

2.1 POLICY AND REGULATORY FRAMEWORK

Knowledge of policies ensures compliance with wildfire prevention and mitigation recommendations, with the CWPP Siskiyou County being the primary reference document. This section lists only new or updated policies and regulations since the 2019 publication of the Siskiyou County CWPP, and also lists local policy pertaining specifically to the Yreka Area.

Please refer to **Section 1.4 of the CWPP Siskiyou County** for the ***complete list*** of policies and regulations relevant to this CWPP, including the California Fire Management Agreement (CFMA), an important policy agreement essential to understanding the interaction of respective agencies during an emergent wildfire response.

2.1.1 Updates – State

- ***2019 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.

- ***California Building Code 2019 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 Fire Hazard Severity Zone (FHSZ) within State Responsibility Areas (SRAs) or any Wildland-Urban Interface (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.

- ***California Residential Code 2019 Chapter 3 Building Planning, Section R337 Material and Construction Methods for Exterior Wildfire Exposure***

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

- ***California Building Code 2019 Chapter 7A***

  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.

SECTION 3. YREKA AREA OVERVIEW

The Yreka Area is located in the northern portion of Siskiyou County, just 22 miles south of the California-Oregon border. It is nestled in the southern portion of the Klamath Mountain Range and at the northern end of Shasta Valley. The area is surrounded by uniquely diverse ecosystems: steep broken mountainous terrain typical of the Klamath National Forest to the west; intermittent gentle grasslands broken by butte structures to the east; and a broad flat plain formed by the historic lava flows of Mount Shasta to the south. Yreka Area elevations range from a high of 6,060 feet at the peak of Antelope Mountain in the north to a low of 2,395 feet where Yreka Creek leaves the area. The lands adjacent to the area are of mixed wildfire management jurisdiction: primary agencies include Federal (USFS, USFWS, BLM and tribal, State (CAL FIRE) and private entities/companies.

Yreka City is the largest city in the county and became the county seat in April 1857. The 2020 census puts the city population at 7,604. Dominant industries still include some mining, along with timber harvesting and ranching. Hunting, fishing, camping and backpacking attract many visitors to the area as well.

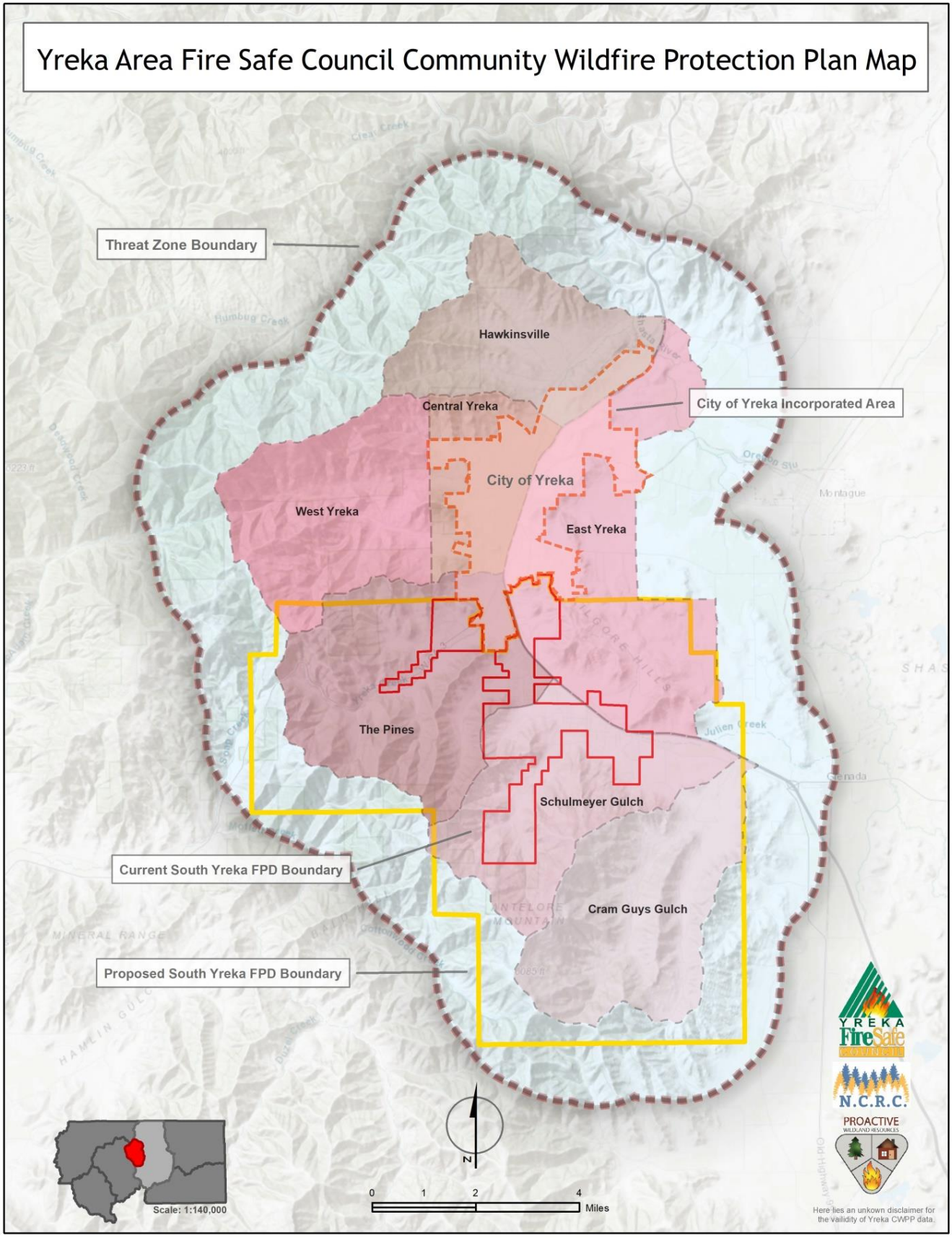
The proximity to Interstate Highway 5 (I-5) adds to a high volume of pass-through/drop-in visitors on a year-round basis. Tourists/visitors are often unaware of the area's fire history and seasonal conditions that pose a significant wildfire risk to citizens and tourists. Warm dry weather of the summer season has substantially increased in duration over the last four decades (NASA Goddard Institute for Space Science, 2020). Thunderstorm activity is a familiar occurrence, causing numerous wildfires each year, typically occurring in steep inaccessible terrain. In the past decade, human-caused ignitions in the Yreka Area's WUI have also posed an increasingly serious threat to nearby communities and resources.

3.1 YREKA AREA PLANNING AREAS OVERVIEW

This updated CWPP provides a wildland fire analysis and protection strategy for an overall area that encompasses the city of Yreka and expands outward with a WUI "threat zone" that has been extended beyond the original CWPP WUI boundary by approximately 1.5 miles in all directions (as depicted in Figure 1).

Ten Planning Areas are addressed. The initial Planning Areas (1-7) were established in the 2013 Yreka Area CWPP for the purpose of accurately defining wildfire assessment elements and producing more specific and useful planning tools and actions in the context of geographical and topological characteristics. *(Note: for clarity, several of the Planning Area names are slightly different in this document compared to the 2013 CWPP).* This CWPP also adds three new Planning Areas (8-10) covered here for the first time to encompass additional considerations (such as important local administrative control aspects).

Figure 1. *Yreka Area Community Wildfire Protection Plan Map*



3.2 THE TEN PLANNING AREAS

1. **Hawkinsville**
2. **East Yreka**
3. **Central Yreka**
4. **West Yreka**
5. **The Pines**
6. **Schulmeyer Gulch**
7. **Cram Gulch and Guys Gulch**
8. **City of Yreka (Incorporated Area)**
   The incorporated City of Yreka crosses several of the original PA boundaries and is delineated with a dotted orange line in the map. It was deemed useful to conduct an assessment to provide details specifically for this area which is under the direct authority of the Yreka Fire Department (YFD).
9. **South Yreka Fire Protection District (SYFPD)**
   For the same reasons (stated in #8), a standalone analysis was also done for the South Yreka Fire Protection District. *[Note: The SYFPD is undergoing a change in their protection boundary and this CWPP assessment uses the proposed boundary which is currently under legal and administrative review. The map displays both the current (solid red line) and proposed (solid yellow line) boundaries.]*
10. **Threat Zone**
    A 1.5 mile buffer zone surrounding the original Yreka Area CWPP boundaries was added to help in assessing threats from outside the WUI or potentially from within the WUI threatening neighboring areas. Wildfires within this buffer zone pose a potential threat because they can spread into the Yreka Area and/or into the outlying areas, depending on wind direction. It is pivotal in the protection strategy within and exterior to the Yreka Area.

3.3 VALUES AT RISK

Values at risk include structures, critical infrastructure, businesses, and other tangible elements. Values also include intangible elements such as natural resources, sensitive species, cultural and historical resources, visual resources, and residents' perspectives about these intangible elements around them. Establishing effective wildfire hazard mitigation actions that protect both sets of values (tangible and intangible) is a challenge. Planning and developing strategies that reduce the overall wildfire threat is central to a balanced action plan that will lead to protection of all values.

An effective CWPP is tailored to focus on and address the most important values as defined collaboratively by the public and the community at large. During the planning process for this CWPP, the following key values were selected as being of primary importance to be addressed:

- Life Safety
- Homes/Structures/Access
- Critical Infrastructure and Municipal Facilities

- Natural and Historic Resources
- Recreation Amenities/Facilities

3.3.1 Life Safety

Human life safety (the physical well-being of all people in the community) was identified as the top priority for the Yreka Area. Recent wildfires that have threatened the area – including the 2018 Klamathon Fire and the 2020 Badger Fire - resulted in public evacuations, firefighter and civilian injuries, and one civilian death.

The complex nature of the Yreka Area WUI presents numerous life safety issues to consider prior to and during a wildfire emergency. These urgent life safety events often demand 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.

Emergency responders fulfill delivery of evacuation notification to citizens for protection of their life safety. Neglecting to take initial evacuation actions can put the lives of these individuals, as well as those of firefighters and law enforcement personnel, at even greater risk.

Awareness of specific population sub-sets and their inherent concerns is important to consider before and during emergency wildfire evacuations, both for responders and neighbors. These groups include:

- Vulnerable populations have special needs and may be less likely to respond to, cope with, and recover from a wildfire. These populations include those who live with a disability (blind, cognitive disorders, mobility limitations), and those who are limited/non-English speaking, culturally isolated, medically or chemically dependent, homeless, deaf or hard-of-hearing, frail, elderly, children, people living in poverty, people without access to transportation, etc. 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 as well as recover from loss. Non-English speakers may face communication barriers in understanding evacuation orders or support services. Planning for vulnerable populations is important to consider and gauge.

- Non-resident populations are short-term residents, visitors, and/or guests. Their interest areas include hiking trails, businesses, hotels, recreation facilities/amenities, short and long-term home rentals, and vacation homes. This contingent is very prominent in the Yreka Area due to its adjacency to the Interstate 5 (I-5) corridor. Individuals passing through and/or enjoying the attractions are likely not familiar with the wildfire threat, burning regulations, road systems, or evacuation routes.

- The homeless are often difficult to reach with public safety information, including wildfire education and preparation information and active emergency situation alerts. There is a significant and growing homeless population in the Yreka Area. As reported in March of 2020 in the Siskiyou Daily News, *"A "point in time" survey conducted in January (2020)*

revealed 244 homeless people in Siskiyou County. This is a 24% increase over 2018 survey results, according to a press release from the Siskiyou Homelessness Coalition. Although that constitutes less than 1% of the county's resident population, homelessness was found to be concentrated along the Interstate 5 corridor, with the greatest numbers in Yreka, Weed and Mount Shasta".

- Citizens with 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. People have risked their lives and the lives of others to save their animals. They may be unwilling to evacuate or enter a shelter during an emergency without their animals, instead choosing to remain in harm's way; and many emergency shelters and evacuation centers deny admission to pets for health and safety concerns (with the exception of service animals). Both owners and their animals can face suffering or death due to poor disaster planning.

3.3.2 Homes/Structures/Neighborhoods

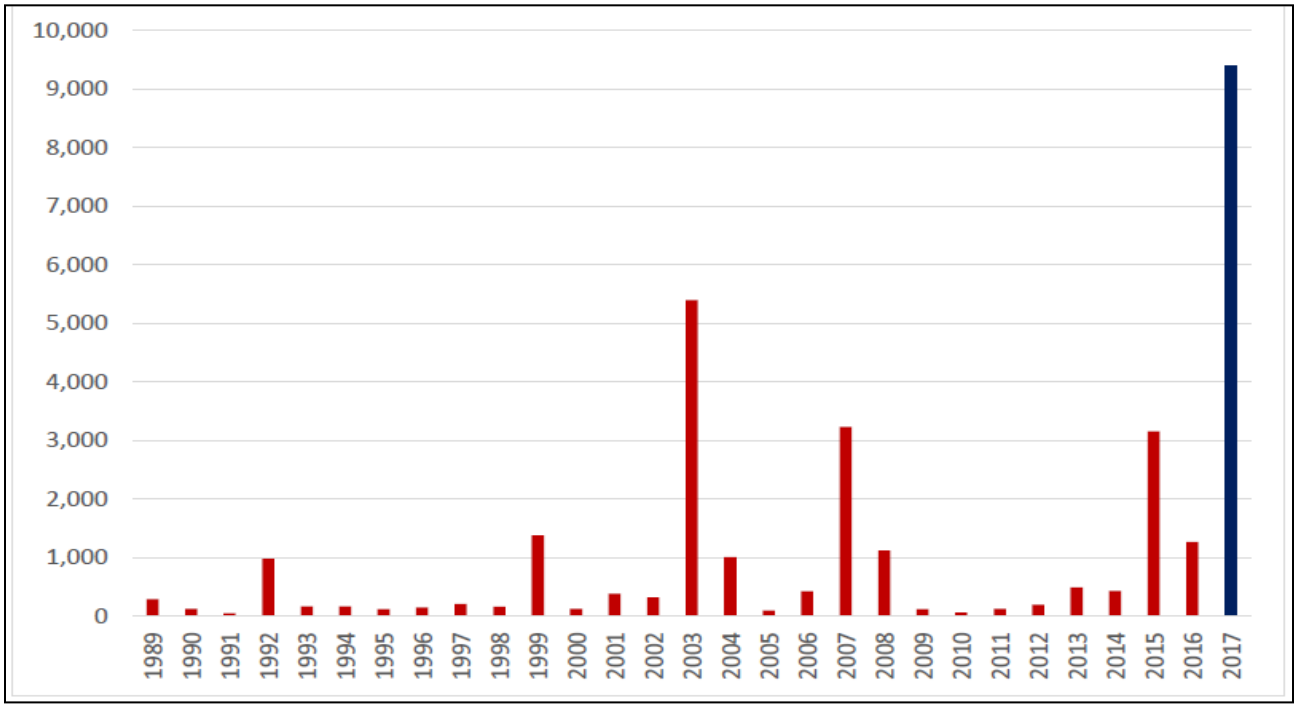
Structure and property loss due to wildfire is noted in the Yreka Area's historical records since the early 1900's. In recent years, the destructive outcome of the 2018 Klamathon Fire and local threat posed by the 2020 Badger Fire were a sobering reality for area citizens. During the Klamathon blaze, over 1,511 people were forced to evacuate. The 2020 Badger Fire prompted evacuations within the Yreka Area, primarily in the Hawkinsville-Humbug vicinity, as it moved toward the city of Yreka proper.

2018 Klamathon Fire, Hornbrook area
Courtesy of P.Titus. Cal OES

Most housing in the Yreka Area consists of single-family homes on lots that vary widely in size. The greatest densities of homes are within or adjacent to the city of Yreka, allowing a wildfire to more easily spread from structure to structure. Once ignited, structure fires threaten adjacent buildings with intense radiant heat, convective heat, and the production of burning embers transported in the air to other structures and fuels.

The enactment of stringent building codes targeted at improving fire resistance has reduced potential loss of residential structures; however, new codes and policies does not completely eliminate the risk. Devastation in the path of northern California's recent wildfires has resulted in unprecedented toll on homeowners, businesses and entire communities. Figure 2 depicts the number of structures destroyed by wildfire in California from 1989 through 2017. The numbers escalated yet further in 2018 and 2020 (updated graphic unavailable).

Figure 2. *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).

3.3.3 Critical Infrastructure and Municipal Facilities

Wildfires can cause significant damage to critical infrastructure and municipal facilities, resulting in substantial disruption and economic losses. The 2018 Klamathon Fire was a clear example as Interstate 5 and the Central Oregon and Pacific Railroad lines were closed. City water service was also problematic, hindering a quick recovery.

2018 Klamathon Fire - Interstate 5

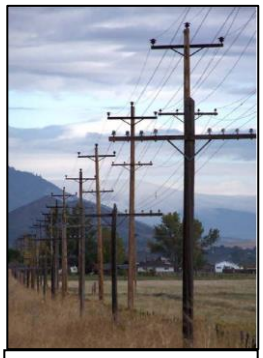
Economic and financial losses can have long-term effects on a community's vitality. It can take days, weeks, or months to repair critical infrastructure, restore services, and rebuild businesses following a wildfire. Taxpayers feel the squeeze of these repairs as each state typically reimburses the majority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

Roads

Areas outside of incorporated communities have limited road systems and, in some cases, unsafe options for access/egress. Road systems 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. When I-5 was closed due to the Klamathon fire, the use of alternate routes on smaller road systems led to traffic congestion and collisions. In extreme cases, emergency personnel and equipment can be delayed or prevented from reaching their objective (as demonstrated during the 2019 Camp Fire). Specific impediments to be aware of and consider include narrow, winding or steep roads; vegetation encroachment into roadways; gates, bridges, addresses not being clearly visible from roads; unlit roads and intersections; unlit street signage; and limited turnaround capabilities.

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. Agencies and companies incur significant repair, restoration, and rehabilitation costs.



Powerline Corridor
Weed/Yreka Area

Pacific Power is the Yreka Area's primary electricity provider. Helpful power related safety references for planning and preparation in a wildfire emergency and information about their Public Safety Power Shutoff (PSPS) program are provided on the Pacific Power website.

Water resources

Rivers, lakes, ponds, tanks, and wells compose a network of water sources that supply the Yreka Area, 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. Community discussions about specific area water resource issues must involve the local fire suppression representatives as well as community leaders.

3.3.4 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 of high value to the Yreka Area. They support citizens economically, culturally and simply for the joy of the extensive beauty added to daily lives. The Yreka Area's setting is unique as it is nestled at the north end of Shasta Valley abutted by mountainous terrain on three sides.

Shasta River
Courtesy of California Trout

Historically, gold was a sought-after resource. Most of the gold mined in this county has been from placers, the largest of which are along the Salmon, Scott, and Klamath Rivers. Considerable production also came from scattered lode deposits in the Humbug, Yreka, Fort Jones, Cherry Creek, and Cottonwood areas. There are over 4,000 mines in the Yreka vicinity, of which approximately 200 are still active.

Livestock, Yreka area
Courtesy of Zillow

Timber and forest resource management have been prevalent activities for roughly a century in this area. Production activities have been central to community livelihood for decades.

The sub-watersheds within the Yreka Area are dominated by montane chaparral and black oak stands in the lower portions transitioning to coniferous forests with rise in elevation. This area is

home to a network of creeks that feed the Shasta River which joins with the Klamath River water system, one of the state's priceless water sources. This water system is key to the agriculture industry and supports both salmon and steelhead trout. Native wildlife includes mule deer, elk, pronghorn antelope, cougar, black bear, and river otters. Open grassland valley areas between the mountain ranges allow for substantial grazing opportunities that support the cattle and livestock industry.

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. Finding a balance with community wildfire protection planning and protection of natural resources is a goal of this plan.

Historic Resources

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

Yreka Preservation Hall
Courtesy of 'Yreka History'

Wildfires can pose a serious threat to these resources unless proactive mitigations are planned. 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.

3.3.5 Recreation Amenities/Facilities

The Yreka Area has abundant outdoor recreation amenities and facilities including extensive trail systems, river/water sports, world class fishing, nearby skiing, mountain biking, as well as public parks.

The impacts of wildfires to recreational opportunities include the loss and/or degradation of recreation facilities and related structures; trail damage due to post-fire flooding and slides; destruction of scenic values, wildlife viewing experiences, and water quality; and reduced 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.

Large wildfire events within the last decade, were a significant deterrent to visitors as recreation and businesses 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 north state affected air quality from early July to October. Wildfire smoke made being outdoors unhealthy and uncomfortable, causing cancellation or postponement of outdoor sporting and social events.

3.4 COMMUNITY AT RISK (CAR)

To help protect people and property from potential catastrophic wildfire, the 2000 National Fire Plan (NFP) identified communities in the wildland-urban-interface (WUI) within the vicinity of Federal lands that were at high risk of damage and/or loss from wildfire. These high-risk

communities were identified in the Federal Register in 2001 (National Archives and Records Administration Federal Register, 2001). This list was extended by the states in 2003. In California, CAL FIRE has the responsibility of managing this list, and uses three main factors to determine which additional communities are at risk: 1) high fuel hazard, 2) probability of a fire, and 3) proximity of intermingled wildland fuels with urban environments.

The NFP specifically directs funding for projects designed to reduce wildfire risks to communities and restore ecological health on Federal lands. Yreka was designated as a CAR and listed in the Federal Register in 2001.

3.4.1 Wildland Urban Interface (WUI)

The Healthy Forest Restoration Act (HFRA) has an established process for developing a WUI boundary, delineating where wildfire could potentially impact a community. For the Yreka Area, the boundary identification task was accomplished in the 2013 version CWPP.

Adhering to CWPP guidance, it is incumbent upon the local Fire Departments, Fire Safe Councils (FSCs) and community citizens to periodically review, define and if needed, update the WUI boundary. During this CWPP update process, interagency coordination provided input and confirmed decisions regarding a newly delineated Threat Zone surrounding the previously defined WUI boundary.

Wildland Urban Interface

The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels.

(NWCG, 2019)

3.5 FIRE PROTECTION

The Yreka Area's fire protection duties and responsibilities are fulfilled by combined forces at 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 support for fire suppression, advanced life support, emergency medical services, technical rescue, and hazardous material response services. Neighboring federal wildland firefighting resources are available for reinforcement or second alarm support, even though they have no direct responsibilities within the Yreka Area.

As noted in *Section 2.1*, the CFMA is an important policy agreement essential to understanding the interaction of respective agencies in their roles and responsibilities during an emergent wildfire response. Table 2 provides key CFMA definitions relevant to this CWPP.

Table 2. *Key Definitions in the California Fire Management Agreement (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.

3.5.1 Wildfire Direct Protection Areas (DPA)

The vast majority of the Yreka Area's wildland protection responsibility is under state (CAL FIRE) or State Responsibility Area (SRA) authority. The City of Yreka is designated as a Local Responsibility Area with CAL FIRE assist. This organization of protection resources provides expedient emergency response to communities using the 'closest resource concept' (committing the closest available appropriate resources, regardless of ownership).

- ***SRA / FRA***
  Annual Operating Plans (AOPs) address wildland fire protection and structure defense to ensure consistency with what is provided by the CFMA. The vast majority of the Yreka Area wildland protection responsibility is under CAL FIRE authority, specifically within Battalion 2 (Shasta Valley) of CAL FIRE's Siskiyou Unit.
- ***LRA***
  Wildland fire protection responsibility for lands outside of SRA and FRA are considered LRA and are not part of the CFMA. The CFMA participating agencies are not jurisdictionally or financially responsible for wildland or other fire protection on these lands. Cost share agreements may document costs to local government agencies that are charged with protection of LRA). The Yreka City Administrative area is designated an LRA.

3.5.2 Yreka Area Suppression Resource Information

FEDERAL: The Klamath National Forest (KNF) Headquarters Office is located in the City of Yreka; however, this agency is are not directly responsible for suppression actions in the Yreka Area. On an 'initial attack' (IA) wildfire emergency response, KNF will provide mutual aid and air resources.

STATE: The Yreka Area's protection is provided by Battalion 2 (Shasta Valley), one of the four Battalions in CAL FIRE's Siskiyou Unit organization. Primary suppression resources in Battalion 2 include 1-Battalion Chief; 4-Type 3 engines; 1-Dozer; 1-Defensible Space Inspector; 1-Lookout.

LOCAL: The Yreka Area's local fire protection is covered by the Yreka Fire Department (YFD) and South Yreka Fire Protection District (SYFPD). Currently, these departments are largely staffed by volunteers. YFD is governed by Yreka City Council and SYFPD is governed by an elected board of directors. Each station has one to three engines ready to respond on a daily

basis. Table 3 is a list of local suppression resources. Fluctuations in resource numbers depend on availability of personnel and equipment. CAL FIRE reciprocates emergency services using Mutual Aid and Automatic Aid Agreements.

Table 3. *Local suppression resource information*

Greater Yreka Area – Local Fire Protection Resources	
Yreka Fire Department	**South Yreka Fire Protection District**
Equipment *(Type, Gallons, Identifier)*	Equipment *(Type, Gallons, Identifier)*
Engine, Type 1 | 500 gal | E412	Engine, Type 1 | 500 gal | E612
Engine Type 1, 75' ladder | 300 gal | T-423	Engine, Type 1 | 500 gal | E610
Engine, Type 3, 4x4 | 500 gal | E416	Engine, Type 1 | 2000 gal | E611
Engine, Type 6, CAF system | 186 gal | E410	Engine, Type 3, 4x4 | 500 gal | E615
Water tender, Type 1 | ETA June 2021	Engine, Type 3, 4x4 | 500 gal | E614
Utility with hand tools, no water | U451	Watertender, Type 1 | 400 gal | WT 630
Personnel	Personnel *(18 fire personnel on roster)*
5 Company Officers	1 Chief Officer, Type 1 Incident Commander
13 Fire-fighters	5 Company Officers
3 Student fire-fighters (variable availablity)	12 Fire-fighter 1 crew personnel

SECTION 4. DEFINING THE WILDFIRE SITUATION

Wildfire is inevitable and the probability of a catastrophic one occurring within or adjacent to Yreka Area communities 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 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 the county or state
- Limited or non-existent safe access for fire suppression resources into fire vicinity

When conducting a science-based wildfire analysis, key factors to consider are fire ecology, climate, and area fire history in conjunction with WUI proximity.

4.1 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 Yreka Area is situated in the Southern Cascade Bioregion (mid-eastern Siskiyou County).

The physical geography of a bioregion is foundational to the ecology of an area, largely affecting the other elements that comprise an ecosystem. The Yreka Area's diverse environment is mirrored in the range of wildfire behavior outputs. The following descriptions broadly define key ecological aspects which influence wildland fire and affect incumbent communities.

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, 2nd Ed. (2018)

Conifer Forests

Mixed Conifer forest
Courtesy of Klamathtribes.org

Conifer forests dominate the mid-montane zone. These stands are often intermixed with woodlands and shrublands. Stand composition is directly influenced by elevation, slope aspect, soil moisture conditions and substrate (Griffin 1967). 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.

Deciduous Hardwoods

In the lower montane zone and alluvial valley areas, oak woodland stands often overtop a grass-shrub understory. In the vicinity of the Yreka Area, the mid-montane zone often consists 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 and fire history.

Ponderosa Pine – Black Oak
Lower elevation slopes
Courtesy of USDA PSW GTR-256

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 sprout vigorously when top-killed. Canyon live oak and California black oak are considered sensitive to moderate-high intensity fire. Under typical weather conditions, fire severity is often lower in oak woodlands.

Shrub/Montane Chaparral

In the Yreka Area, forest cover is often interrupted by stands of montane chaparral. Shrub species dominance varies with substrate, soils, and other conditions. The lower and mid-montane zone is characterized by a complex and diverse intermixing of vegetation and a diversity of fire regimes. Many of the species are adapted for seasonal and larger episodic droughts. 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. Other commonly occurring shrubs include greenleaf manzanita (*Arctostaphylos patula*), California-lilac or deer brush (*Ceanothus integerrimus*). Once a wildfire becomes well established in this fuel type it is more likely to be a high intensity event. These more common shrubs also tend to sprout vigorously after being top-killed by wildfire. Recurring fire plays a key role in the maintenance of these shrub communities by inhibiting succession from shrubs to trees (Nagel and Taylor 2005; Lauvaux et al. 2016).

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.

NWGC Glossary, 2019

Shrub - Humbug Creek
Courtesy of Realtor.com

Grasses/Forbs

Lower elevations are dominated by grasslands, shrublands, and woodlands. 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. 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.

Shasta Valley Grasslands
Courtesy of Yreka News

4.2 CLIMATE

The Yreka Area is categorized as a Mediterranean climate. It is characterized by the typical precipitation pattern of dry and warm summer months with moisture occurring in the late winter and spring. Generally, increasing elevation results in decreased temperatures and increased annual precipitation, with most precipitation falling as snow in higher elevations. Shasta Valley is one of the drier locations located in the rain shadow of the Klamath range. Critical fire weather occurs with frontal passages and associated high wind / low humidity scenarios. Summer thunderstorms are often the source of lightning-ignited fires; they also account for 12-19% of total annual precipitation (Fire in California Ecosystems, 2018).

4.2.1 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. As fire season lengthens without measurable precipitation, concern centers on wildfires starting during these exceptionally windy, low relative humidity and dry fuels situations. The State has experienced many such fires in recent history: Camp (Paradise), Tubbs (Santa Rosa), Zogg (Redding area).
- 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.

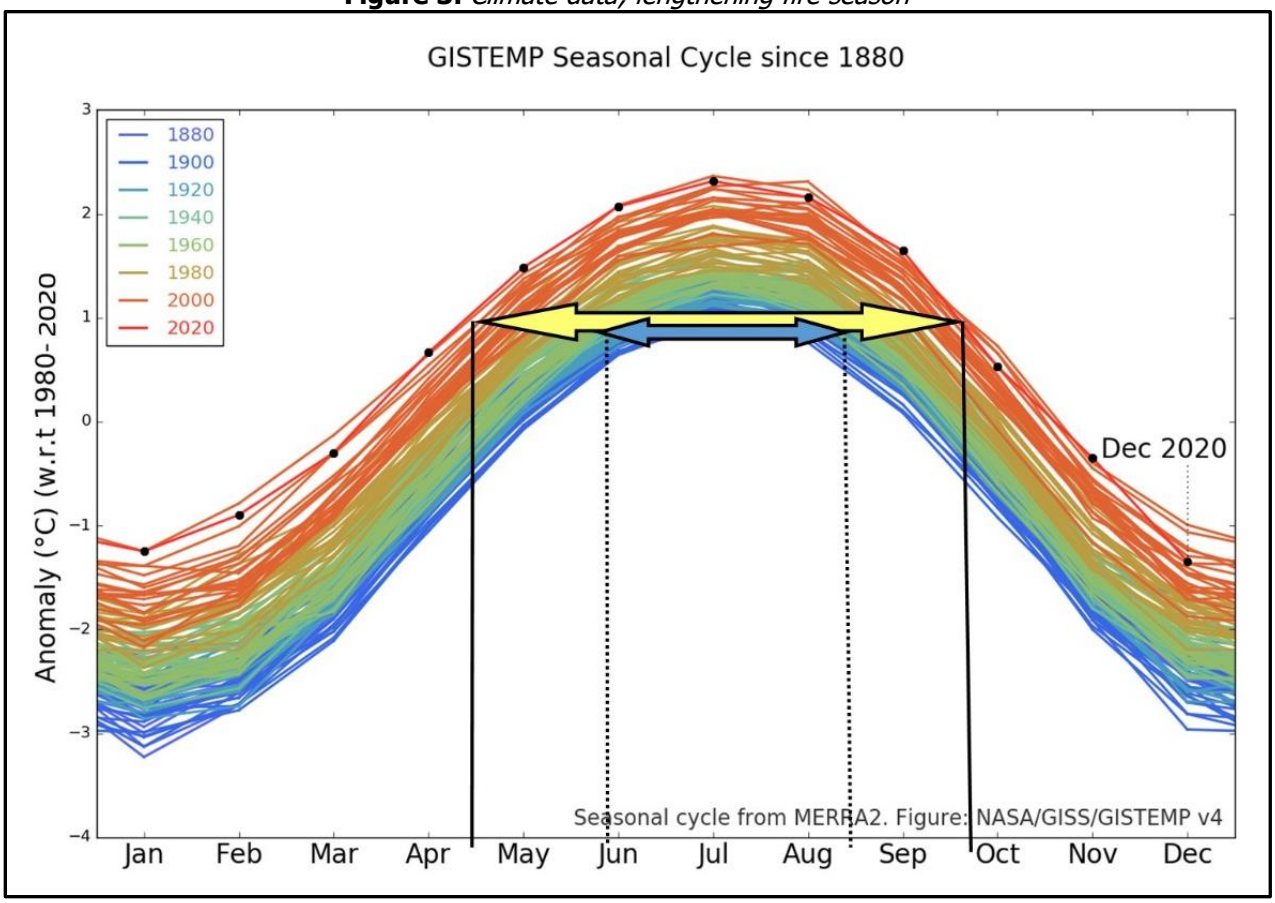
4.2.2 Climate Change

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 (see Figure 4). 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, 2018).

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.

Figure 3. *Climate data; lengthening fire season*



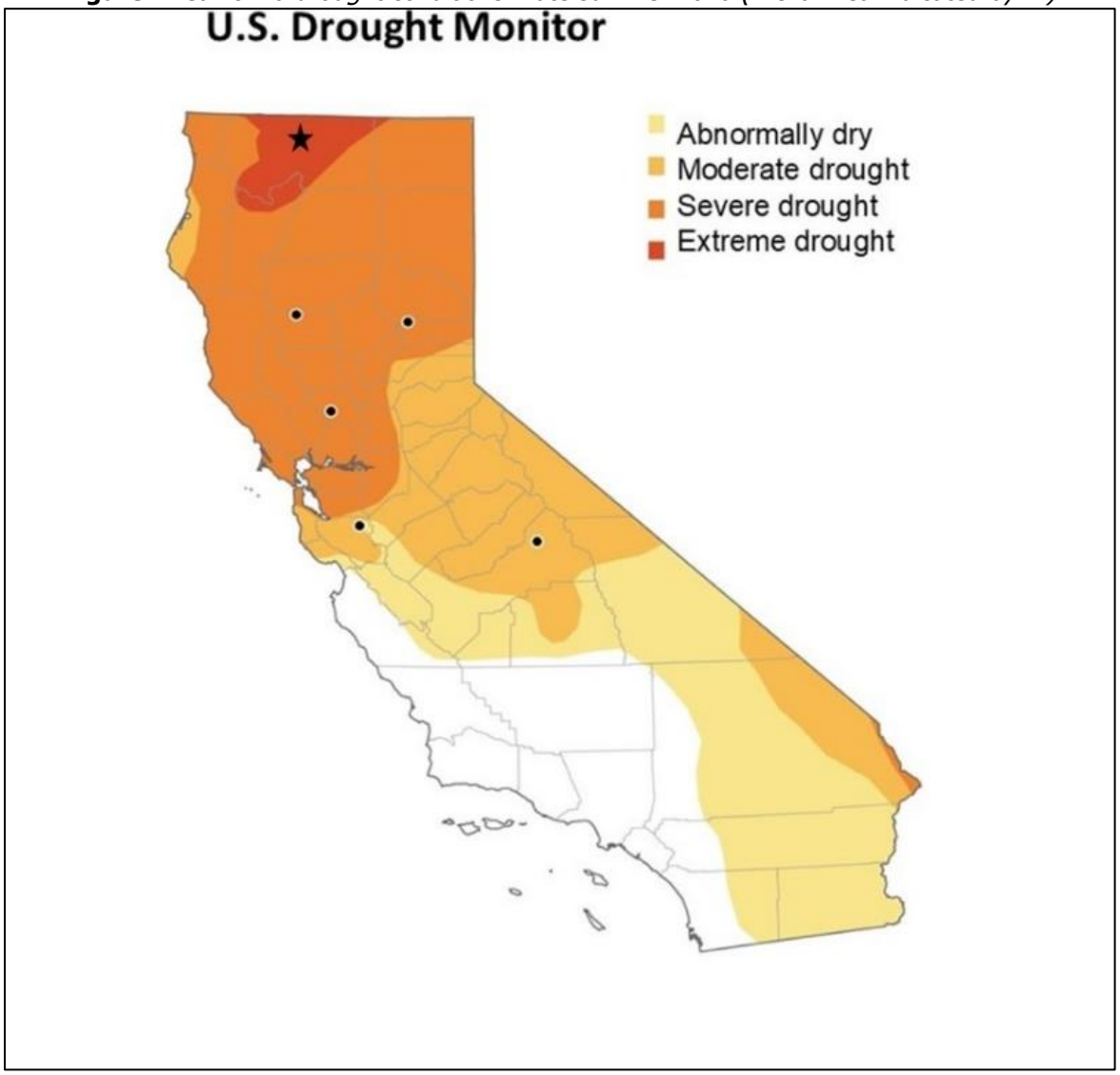
Source: NASA Goddard Institute for Space Science, 2020

4.2.3 Drought

The most recent drought period in California (beginning in approximately 2011) was one of the worst in the past century with significant impacts including fierce wildfires, water shortages and staggering agricultural losses. The dryness in California is only part of a longer-term drought trend across most of the Western United States, one that bio-climatologist 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).

The substantial increase in fire size and severity is an effect of the extended drought. As depicted in Figure 4, during 2020's unprecedented wildfire season, the Yreka area was one of the most drought prone areas of the entire state.

Figure 4. *California drought conditions - late summer 2020 (Yreka Area indicated by ★)*



Recent drought related wildfire trends

Drought-related fire behavior in 2018 resulted in some of California's first "megafires". The Carr Fire ravished Redding suburbs and burned 229,651 acres; and the Mendocino Complex Fire burned 459,123 acres, up to that point the largest fire in state history. In November, the devastating Camp fire (Paradise, CA) destroyed a record-breaking number of homes and structures, decimating the entire town.

What transpired in the summer of 2020 was simply beyond comprehension. A record-setting year of wildfires burned across the state, burning more area than ever measured during the modern era of wildfire management and record keeping. By the end of the year, 9,639 fires had burned 4,397,809 acres (CAL FIRE 2021) - more than 4% of the state's roughly 100 million acres of land

- making 2020 the largest wildfire season recorded in California's modern history. The August Complex fire has been described as the first "gigafire," as the area burned exceeded 1 million acres.

4.2.4 Tree Mortality

When forest density is high under drought conditions, competition for water and nutrients is amplified. Trees in this weakened condition are less effective at defending themselves from bark beetles and other pests.

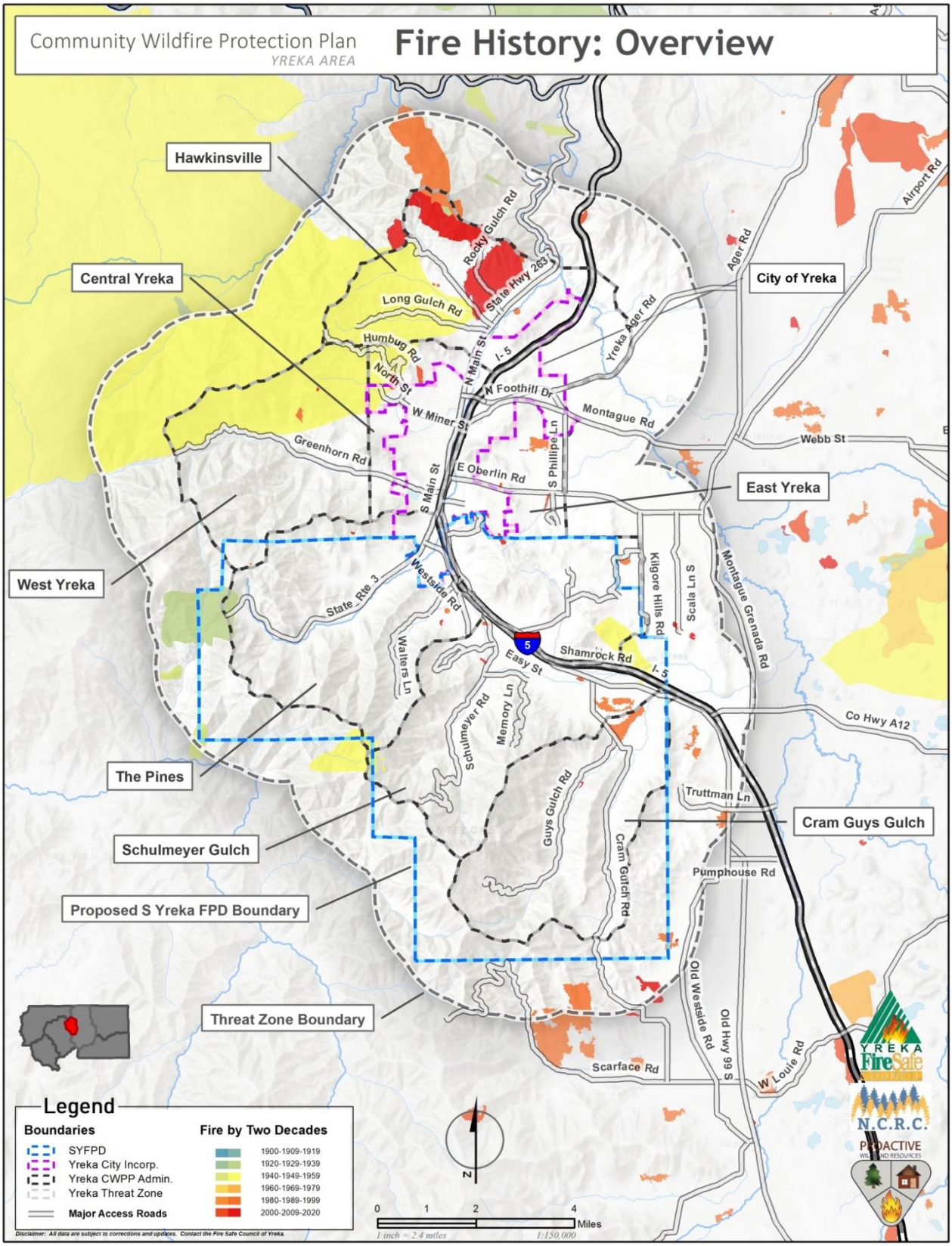
Overgrown forests, years of drought and bark beetles have created a situation where millions of trees throughout California are dead or dying. Data collection in April 2017 revealed 850,000 acres throughout Siskiyou County and adjacent to the Yreka Area as having some degree of tree mortality, with over 76,000 acres designated as having high to extreme tree mortality.

Conifer Mortality
Courtesy of Siskiyou County, Tree Mortality Task Force

4.3 AREA FIRE HISTORY

Figure 5 depicts a graphic representation of the Yreka Area'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. Recent wildfires have threatened the Yreka Area in multiple cases, yet the area has not experienced a substantially destructive wildfire in over 55 years. In theory, the absence of fire in an area adds to an increased probability of wildfire occurrence. *Section 5.5* shows recent wildfire events that directly threatened the area and provides potential results under adverse conditions to utilize for community preparations.

Figure 5. *Yreka Area Fire History*



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

Historic

Most areas of the Southern Cascades region experienced a fire frequency decline at approximately the beginning of organized fire suppression (early 1900's). Even then, rural residents would often continue burning to maintain forage for livestock. 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).

Twentieth Century

Changes in fire occurrence dictate fire regime change and accompany change in landscape vegetation patterns. Intermittent patterns of vegetation have been replaced by more continuous formations and 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 (Miller, et al. 2012).

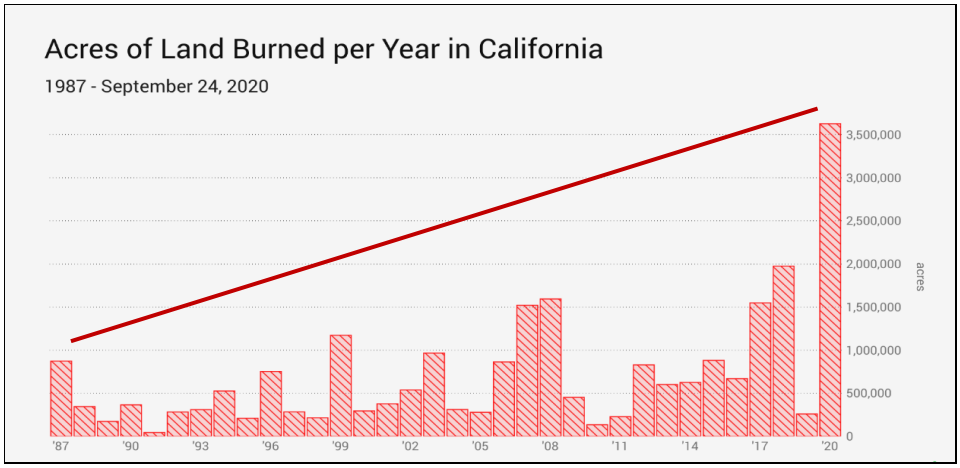
The larger the fire, the larger the maximum high-severity burn patches (Miller, et al. 2012). This pattern is related, in part, to higher quantities and more continuous, homogeneous fuels caused by accumulation during the fire-suppression period.

Twenty-first Century

In the early 21st century, fires have been bigger, more communities have burned, and firefighters have continued to die. This situation has become a crisis and 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.

Figure 6 depicts the extraordinarily rapid increasing trend in California's wildfire acreage over the last 4 decades. Seven of the top 10 most destructive fires in California's history have occurred since 2015, and in 2020 there were a total of 9,917 incidents which burned an unprecedented 4,257,863 estimated acres, caused 33 fatalities, and damaged or destroyed 10,488 structures. This dramatic fire season was driven in part by an on-going drought coupled with an extreme heat wave and lightning storms.

Figure 6. *Wildfire size trend*



Source: CAL FIRE, 2021

Table 4 and Table 5 list California's Top 20 Largest and Top 20 Most Destructive wildfires. Fifteen of the twenty largest wildfires and nineteen of the twenty most destructive wildfires have occurred in the 21st Century (CAL FIRE, January 15, 2019).

Table 4. *Top 20 Largest California Wildfires*

	FIRE NAME (CAUSE)	DATE	COUNTY	ACRES	STRUCTURES	DEATHS
1	**AUGUST COMPLEX** *(Under Investigation)**	August 2020	Mendocino, Humboldt, Trinity, Tehama, Glenn, Lake, & Colusa	**1,032,649**	935	1
2	**MENDOCINO COMPLEX** *(Under Investigation)*	July 2018	Colusa, Lake, Mendocino & Glenn	**459,123**	280	1
3	**SCU LIGHTNING COMPLEX** *(Under Investigation)**	August 2020	Stanislaus, Santa Clara, Alameda, Contra Costa, & San Joaquin	**396,624**	222	0
4	**CREEK FIRE** *(Under Investigation)**	September 2020	Fresno & Madera	**377,693**	853	0
5	**LNU LIGHTNING COMPLEX** *(Under Investigation)**	August 2020	Sonoma, Lake, Napa, Yolo & Solano	**363,220**	1,491	6
6	**NORTH COMPLEX** *(Under Investigation)**	August 2020	Butte, Plumas & Yuba	**318,930**	2,352	15
7	**THOMAS** *(Powerlines)*	December 2017	Ventura & Santa Barbara	**281,893**	1,063	2
8	**CEDAR** *(Human Related)*	October 2003	San Diego	**273,246**	2,820	15
9	**RUSH** *(Lightning)*	August 2012	Lassen	**271,911 CA / 43,666 NV**	0	0
10	**RIM** *(Human Related)*	August 2013	Tuolumne	**257,314**	112	0
11	**ZACA** *(Human Related)*	July 2007	Santa Barbara	**240,207**	1	0
12	**CARR** *(Human Related)*	July 2018	Shasta County & Trinity	**229,651**	1,614	8
13	**MATILIJA** *(Undetermined)*	September 1932	Ventura	**220,000**	0	0
14	**WITCH** *(Powerlines)*	October 2007	San Diego	**197,990**	1,650	2
15	**KLAMATH THEATER COMPLEX** *(Lightning)*	June 2008	Siskiyou	**192,038**	0	2
16	**MARBLE CONE** *(Lightning)*	July 1977	Monterey	**177,866**	0	0
17	**LAGUNA** *(Powerlines)*	September 1970	San Diego	**175,425**	382	5
18	**SQF COMPLEX** *(Lightning)*	August 2020	Tulare	**170,384**	228	0
19	**BASIN COMPLEX** *(Lightning)*	June 2008	Monterey	**162,818**	58	0
20	**DAY FIRE** *(Human Related)*	September 2006	Ventura	**162,702**	11	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.
*Numbers not final.

11/3/2020

Table 5. *Top 20 Most Destructive California Wildfires*

	FIRE NAME (CAUSE)	DATE	COUNTY	ACRES	STRUCTURES	DEATHS
1	**CAMP FIRE** *(Powerlines)*	November 2018	Butte	153,336	**18,804**	85
2	**TUBBS** *(Electrical)*	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	**NORTH COMPLEX** *(Under Investigation)**	August, 2020	Butte, Plumas, & Yuba	318,935	**2,352**	15
6	**VALLEY** *(Electrical)*	September 2015	Lake, Napa & Sonoma	76,067	**1,955**	4
7	**WITCH** *(Powerlines)*	October 2007	San Diego	197,990	**1,650**	2
8	**WOOLSEY** *(Under Investigation)*	November 2018	Ventura	96,949	**1,643**	3
9	**CARR** *(Human Related)*	July 2018	Shasta County, Trinity	229,651	**1,614**	8
10	**GLASS FIRE** *(Under Investigation)**	September 2020	Napa & Sonoma	67,484	**1,520**	0
11	**LNU LIGHTNING COMPLEX** *(Under Investigation)**	August 2020	Lake, Napa, Sonoma, Yolo & Solano	363,220	**1,491**	6
12	**CZU LIGHTNING COMPLEX** *(Lightning)*	August 2020	Santa Cruz, San Mateo	86,509	**1,490**	1
13	**NUNS** *(Powerline)*	October 2017	Sonoma	54,382	**1,355**	3
14	**THOMAS** *(Powerline)*	December 2017	Ventura & Santa Barbara	281,893	**1,063**	2
15	**OLD** *(Human Related)*	October 2003	San Bernardino	91,281	**1,003**	6
16	**JONES** *(Undetermined)*	October 1999	Shasta	26,200	**954**	1
17	**AUGUST COMPLEX** *(Under Investigation)**	August 2020	Mendocino, Humboldt, Trinity, Tehama, Glenn, Lake, & Colusa	1,032,649	**935**	1
18	**BUTTE** *(Powerlines)*	September 2015	Amador & Calaveras	70,868	**921**	2
19	**CREEK FIRE** *(Under Investigation)**	September 2020	Fresno & Madera	377,693	**856**	0
20	**ATLAS** *(Powerline)*	October 2017	Napa & Solano	51,624	**783**	6

"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.
*Numbers not final

11/3/2020

The Future

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.

Jon Keeley, a research scientist with the United States Geological Survey, noted that the major, multi-year drought that hit California between 2011 and 2019 killed off an immense amount of vegetation in the state. He acknowledges that climate change "almost certainly" exacerbates fire-friendly conditions in California, but says that's only part of the story (PBS 2020).

One thing that remains constant is the fact that humans are responsible for the vast majority of the blazes that occur every year. Keeley argues that the role of human activity should be emphasized when it comes to addressing root causes of massive wildfires, and points to both the practice of fire suppression and California's increasing population as primary factors.

Regarding the 2020 fire events in northern California, Keeley states: "The bottom line is this is a multifactor problem. It's not just climate change, it's not just the drought, it's not just dieback. It's management activities that have suppressed fires for over a century — a lot of things going on. The way I see the current situation in California, this is the perfect storm. Everything is coming together at once."

4.4 YREKA AREA WILDLAND FIRE ENVIRONMENT

Countryman, a renowned wildland fire researcher, defines the fire environment as "the conditions, influences and modifying forces that control fire behavior" (Countryman, 1972). 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 surrounding the Yreka Area.

4.4.1 Fuels

Vegetation is the primary fuel source for wildfires and is the foundational factor in modeling fire hazard (although many human-made sources also become fuel, including structures and ornamental vegetation). All contribute to the fire environment and can significantly affect Fire Behavior (see *Section 4.4.4*).

Over the last several decades, much of the wildland forest area fuels have grown densely overstocked, causing unhealthy conditions which can produce high severity fires. The interface between the communities and forest is potentially hazardous during wildfires as modeled fire intensity is often greatest in this zone.

Many communities have incorporated areas of natural vegetation often termed "Open Space" in their plans. However, limited wildland fuels management in these Open Space areas pose problems that affect community resilience with respect to wildfire. From a wildfire protection perspective, these areas have the potential to produce wildfires and/or are threats to communities. 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 open space lands within communities (Fennesy, 2014) include:

- 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

Any fuel source in wildlands surrounding a community or in open space within a community directly influences wildfire behavior. The physical properties of wildland fuels are defined by a set of characteristics.

Fuel Characteristics

Primary fuel characteristics that affect wildland 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 various fire behavior processes. Understanding the association between fuel characteristics and fire behavior helps facilitate the design of effective fuel treatment strategies.

- ***Fuel Types/Fuel Models***

  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. Reduction or removal of vegetation modifies the fuel model and fire behavior on the landscape (Scott, J.H. and Burgan, 2005). Yreka Area Fuel Models are discussed in detail in *Section 5.2.1*.

- ***Fuel Moisture***

  Fuel moisture is a dynamic variable controlled by seasonal and daily variations in the weather. The moisture of living and dead fuel directly influences wildland fire behavior. Lower moisture = higher flammability; higher moisture = lower flammability.

  Manzanita: dead and live fuels
  Courtesy of J. Titus

  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 (air or ground/surface) changes the fuel moisture content. Smaller diameter fuels such as dry grasses exchange moisture quite rapidly. Table 6 displays the rate of exchange of moisture between dead fuel and the environment. Timelag is the time required to reach equilibrium with surrounding environment (Andrews, 2008).

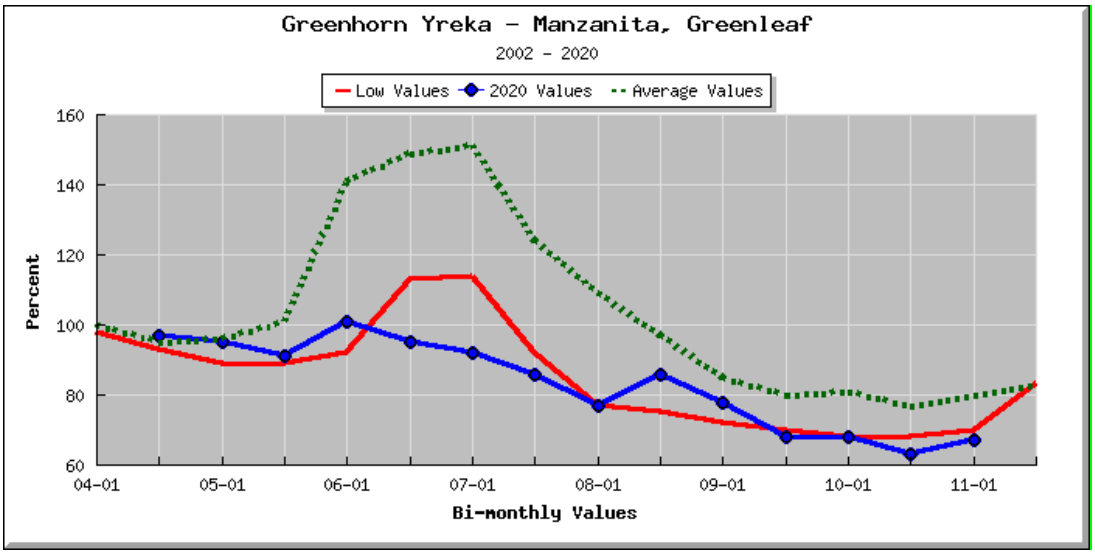
Table 6. *Dead Fuel Moisture and Timelag Relationship to Fuel Size*

Diameter Class	Timelag	Fuel Description
0 – 0.25"	1-hour	Grasses, forbs
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. Internal physiological mechanisms and external influences regulate live moisture through rainfall, drought, aspect, elevation, and seasonal drying patterns. Typically, live fuel moistures are highest in the spring and early summer and lowest in late summer and winter.

Agencies conduct live fuel moisture sampling and data analyses. As an example, Figure 7 displays current, average and low fuel moisture data for Greenleaf Manzanita from the Greenhorn, Yreka area (US Forest Service National Fuel Moisture Database).

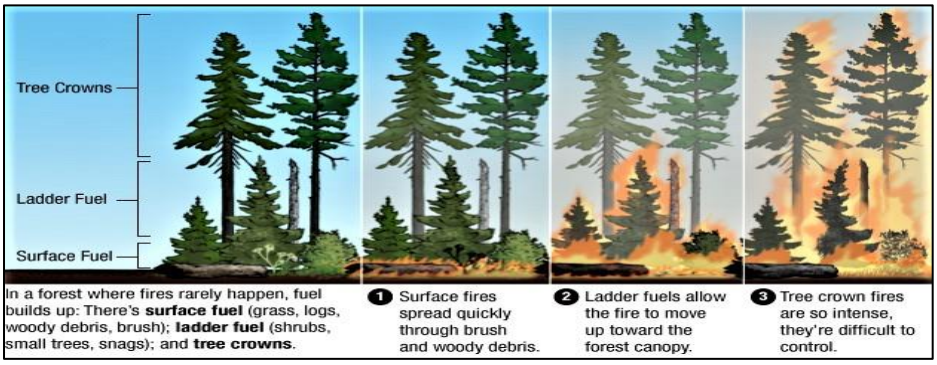
Figure 7. *Example Fuel Moisture Data*



- ***Fuel Loadings***
  Fuel loadings vary greatly by fuel types. Generally, grasslands produce fuel loadings between 1 to 5 tons per acre, 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 heavier fuel loads releasing more heat energy lighter fuel loads.

- ***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 the Yreka Area, fuel continuity is occasionally disrupted by road systems and neighborhoods; however, many roadways lack adequate fuel clearance, thereby limiting an adequate break of continuous fuel beds. Even in a broken/discontinuous fuel bed, the presence of wind or steep slopes, can cause embers and/or radiant heat to advance the wildfire front. The predominant fuel types in the Yreka Area are receptive to flaming or glowing embers (firebrands), resulting in a high probability of spot fire occurrence.

- ***Vertical Arrangement***
  Vertically arranged fuels are those that can carry fire burning in surface fuels into the shrub canopy, then into (crowns) of taller trees. A continuous vertical fuel bed is known as "ladder fuels".



- ***Chemical Properties***
  Chemical properties of fuel are 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.

4.4.2 Weather

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

The difference between weather and climate is a measure of time. Weather is atmospheric conditions over a short period of time, and climate is how the atmosphere "behaves" over relatively long periods of time.

Local weather factors affect stages of the wildfire process from ignition phase, to flaming propagation phase, to the cool-down phase as it dies out. On-site weather elements (temperature, relative humidity, precipitation, and winds) are constantly monitored in a wildfire management operation and play a key role in strategy and tactics.

Frontal passages and associated wind events create fire weather alert situations (fire weather watch/red flag warning). During these wind events, dry season conditions (defined by low relative humidity, dry fuels, heat and low humidity recovery) produce a recipe for rapid wildfire growth.

Problematic Weather Scenarios

During the fire season, general weather conditions consist of light to moderate winds, hot temperatures, low humidity and poor night-time humidity recovery. A wildfire ignition can rapidly transition from a surface to a crown fire and spread by spotting ignitions well ahead of the main fire. These conditions often cause considerable resistance to containment by firefighting resources.

Extreme "red flag" weather conditions are a common occurrence in the Yreka Area throughout summer and fall, and can continue into winter. Two of the more common triggers of these conditions are:

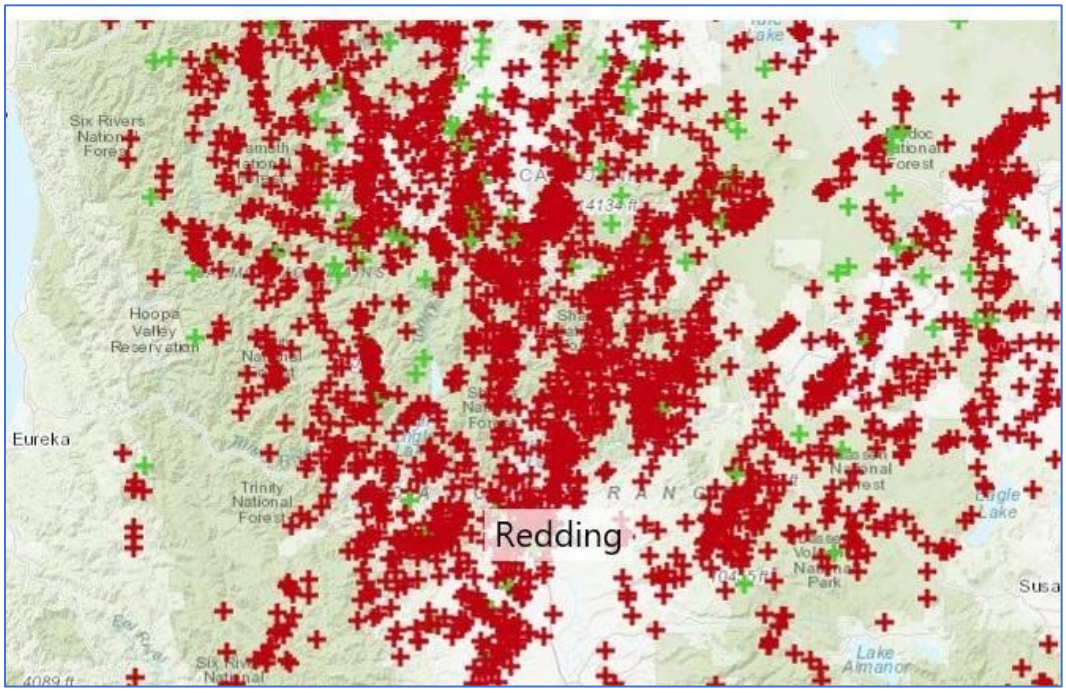
A **Red Flag Warning** is issued for weather events which may result in extreme fire behavior that will occur within 24 hours. It is the ***highest alert.***

A **Fire Weather Watch** is issued when weather conditions could exist in the next 12-72 hours.

(NWS / CAL FIRE)

1) A forecasted dry lightning-strike event (without precipitation). These events occur primarily over higher elevations and mountainous terrain. They can be accompanied by strong erratic updraft and downdraft winds, creating conditions for short-term, rapid flare-ups in behavior. Once these storms abate, multiple new wildfire ignitions are commonly discovered. This scenario is common over the local mountain ranges. Figure 8 illustrates a recent occurrence of a two-day lightning strike event in Northern California.

Figure 8. *Lightning Strike Map, Northern California Area, August 9-10, 2019*



Source: National Weather Service Sacramento

2) Winds associated with frontal passages and atmospheric pressure gradient changes. This weather condition is the most common red flag causal factor throughout the fire season and can become extended in duration, ranging from several hours to multiple days. When combined with low fuel moisture conditions, the dry air mass and strong gusty winds can cause wildfires to quickly become explosive in behavior and characteristics.

4.4.3 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 wildfire spread. These topography factors include slope, aspect,

terrain or land features, and elevation. Topography modifies general weather by channeling wind, creating thermal belts, producing orographic (pertaining to upwelling slopes) thunderstorms, and contributing to Foehn (or Northerly) winds.

Of all the topographic features, the steepness of slope is the most influential on fire behavior.

A basic fire science principle is the fact that fire will burn faster uphill as 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 9.

Figure 9. *Effect of slope on fire spread*

4.4.4 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.

> **Fire Behavior (FB):** The manner in which a fire reacts to the influences of fuel, weather, and topography.
>
> (NWCG, 2019)

The diversity of fuels, topography and weather across the Yreka Area exhibits a fire environment that supports a full spectrum of fire behavior. The following are general concepts to help understand fire behavior aspects. Broad categories of the types of wildland fire observed on the landscape include:

- **Surface fires:** Fire burning in material at ground level including low vegetation such as grasses, low shrubs, small trees, and woody debris on the soil surface.
- **Torching fires:** 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 transports firebrands outside the main perimeter of the fire. A "spot fire" develops and grows if a firebrand lands on a receptive fuel-bed. In this analysis the 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; 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 distinguished by fuels that are actively burning, and adjectives used to describe fire behavior are quantifiably categorized by ROS and FL (Table 7).

Table 7. *Adjective Ratings for Fire Behavior 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**

The concepts of wildfire science that have been introduced in this section are the foundation for the assessment work outlined in *Section 5,* which will produce tools for community protection planning.

An analysis of wildfire potential utilizes established assessment methods and scientifically accepted fire models. The following assessment is 1) a derivative of analysis work completed by CAL FIRE in their Fire and Resource Assessment Program (FRAP) and 2) a more focused analysis utilizing local weather data and targeted vegetation/fuels information. The focused analysis was undertaken using the U.S. Forest Service Wildland Fire Decision Support System (WFDSS) and the Short-term Fire Behavior and FS-Pro (Fire Spread Probability Model) subsystems.

This section begins by using higher-level analyses available from the Siskiyou County CWPP to convey elements of Wildland Fire Hazard Severity and the components that define it (Fuel Models, Fuel Rank, and Wildland Fire Threat).

It continues by focusing down to the Yreka Area level to convey elements of wildfire hazards and risks (Risk and Burn Probability and Initial Attack Suppression Opportunity). These data then enable even further analysis to assist in identifying areas that are problematic for first responders and in providing information that can inform decisions on areas for targeted priority projects (see *Part II. Planning Areas*).

This section concludes with assessments on two local recent wildfires which are modeled to show potential risk factors based on outcomes utilizing science-based scenarios This evaluation provides perspective for how these fires may have behaved and spread had they started under very different, yet highly likely, circumstances.

5.1 WILDLAND FIRE HAZARD SEVERITY

PRC (Public Resources Code) 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, aid in defining the application of various mitigation strategies to reduce risk associated with wildland fires. Fire models provide a quantitative basis for rating fire danger and predicting fire behavior. These foundational modeling concepts continue to be the basis of current wildfire prediction work.

Fire Hazard Severity is an assessment of the threats or potential impacts arising from wildland fire. The Fire Hazard Severity rating system is a way to measure or model physical fire behavior so that potential wildfire damage can be predicted (FRAP, CAL FIRE, 2008). Wildfire behavior outputs include the speed that it moves, the amount of heat it produces, and 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.

5.1.1 Fire Hazard Severity Zones

Fire Hazard Severity Zones (FHSZs), as approved by CAL FIRE and required by law, use data and models that describe fire development patterns and estimated behavior characteristics based on potential fuels over a 30 to 50 year time horizon (FRAP, CAL FIRE, 2008). CAL FIRE is in the process of reviewing and updating information as a result of the past several years of severe wildfire impacts on the state.

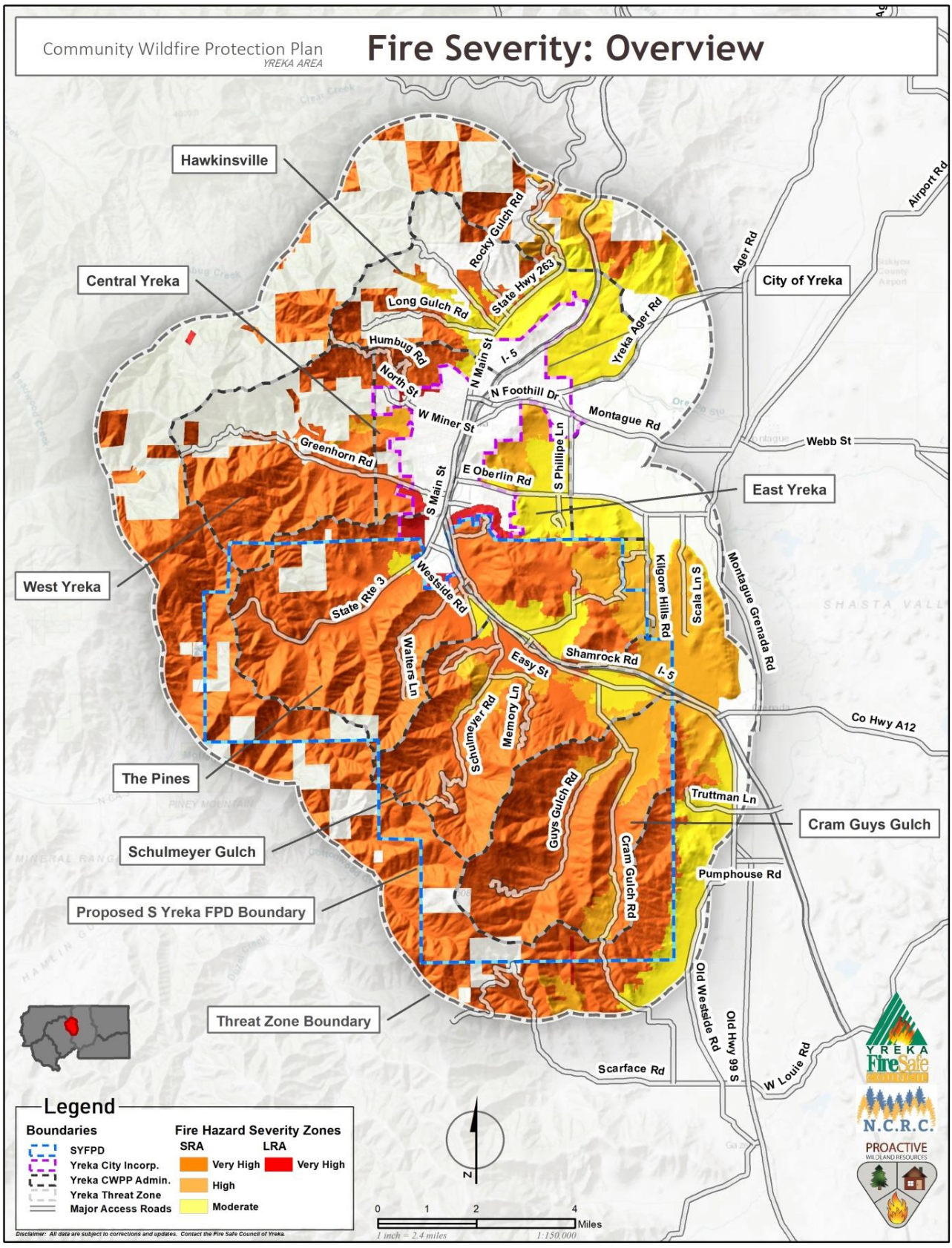
FHSZs provide the basis for mitigation strategies to reduce wildland fire risks to structures. These zones also correlate to building code requirements designed to reduce structure ignition potential in WUI. They also provide criteria utilized by the insurance industry in the evaluation process for both home coverage policies and cases involving loss from wildfire. This state level FHSZ analysis does not cover the Federal Responsibility Area (FRA) landscape. Figure 10 depicts the Yreka Area'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. The data were 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.

CAL FIRE is required by law (PRC 4789) to assess California's susceptibility to wildland fire events on private lands. Updates to state data are underway. Recent large devastating fire seasons have prompted a refocus on statewide analyses. The data used for this CWPP come from the Siskiyou County CWPP (published in May of 2019) which was derived from a CAL FIRE update which occurred in 2010. Ongoing and updated data are available on the Office of the State Fire Marshall website.

Figure 10. *Fire Hazard Severity Zones for SRA and LRA – Yreka Area*



Note: Hillside shading does not indicate a difference in FHSZ classification.

5.2 COMPONENTS OF FIRE HAZARD SEVERITY

Fuel rank is the foundation of the CAL FIRE's Fire Severity modeling depicted in Figure xx above. Fire hazard levels are represented by vegetation/fuels *in relation to the energy output when it burns*. Vegetation is further classified into "fuel profiles" (grouping of burnable material that tends to burn in a similar manner).

This Fuel Rank data models wildfire potential on the landscape and represents fire hazard. The model methodology assigns ranks based on expected fire behavior using combinations of vegetative fuels and topography under adverse severity level weather conditions (high wind speed, low humidity, and high temperature).

The following three sections introduce new terminology and concepts; the figures associated with them are on the three pages below the narrative.

5.2.1 Fuel Models

Vegetation species of an area are referred to as "fuel types". Fuel type data is coarsely mapped and available in state-level and national-level databases. Fire researchers take this data and use the most common fuels for any specific area to predict primary fire behavior, which results in "Fuel Models" (FM) for that area. Yreka Area Fuel Models are depicted in Figure 11.

> **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, 2019)

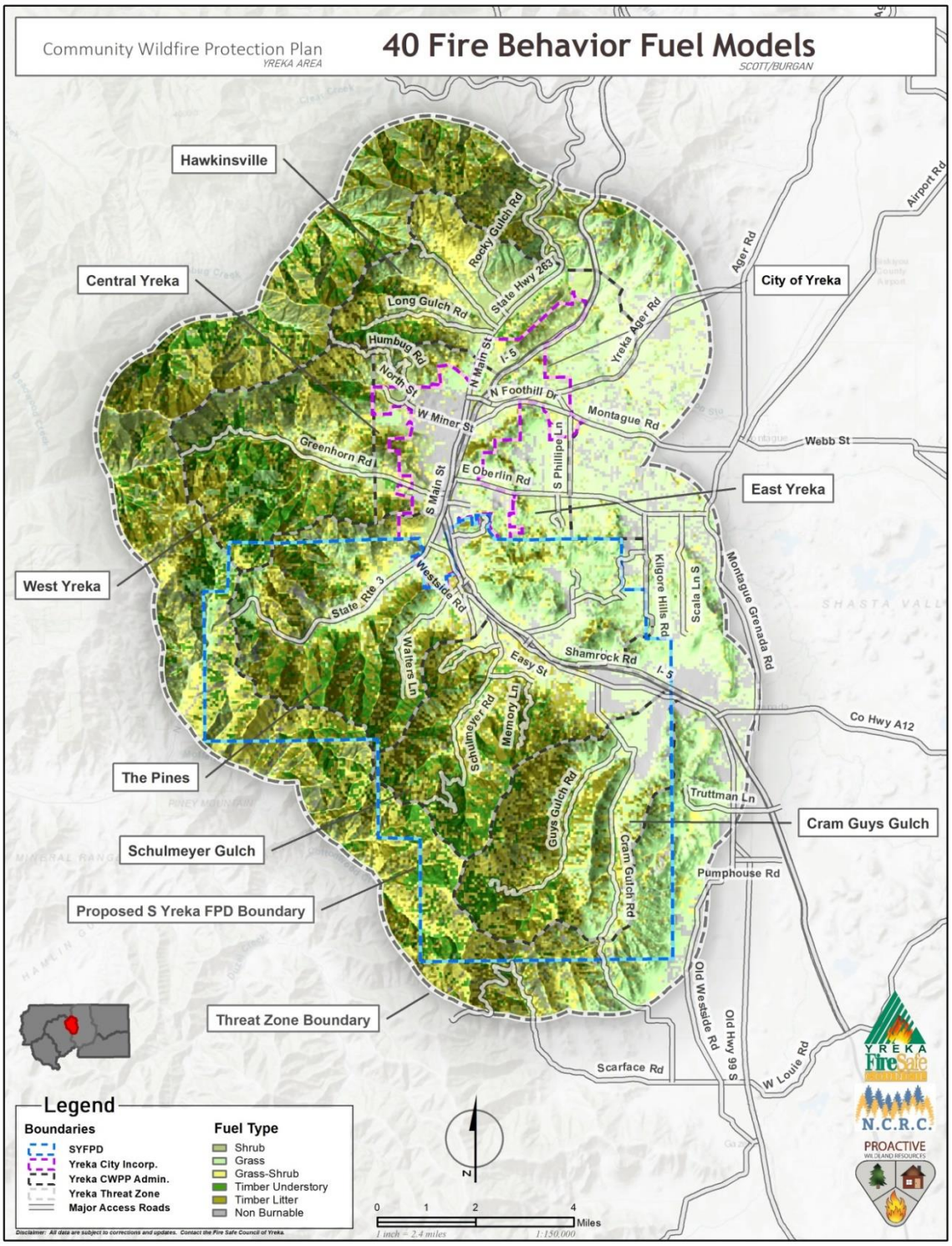
5.2.2 Fuel Rank

As an example of how fuel models affect fire behavior, grass dominant fuel models will spread fifteen times faster than fuels burning in a timber or shrub understory (beneath a canopy). Figure 12 displays Fuel Rank data for the Yreka Area. This Fuel Rank data models wildfire potential on the landscape and represents fire hazard. The model methodology assigns ranks based on expected fire behavior using combinations of vegetative fuels and topography under adverse severity level weather conditions (high wind speed, low humidity, and high temperature).

5.2.3 Wildland Fire Threat

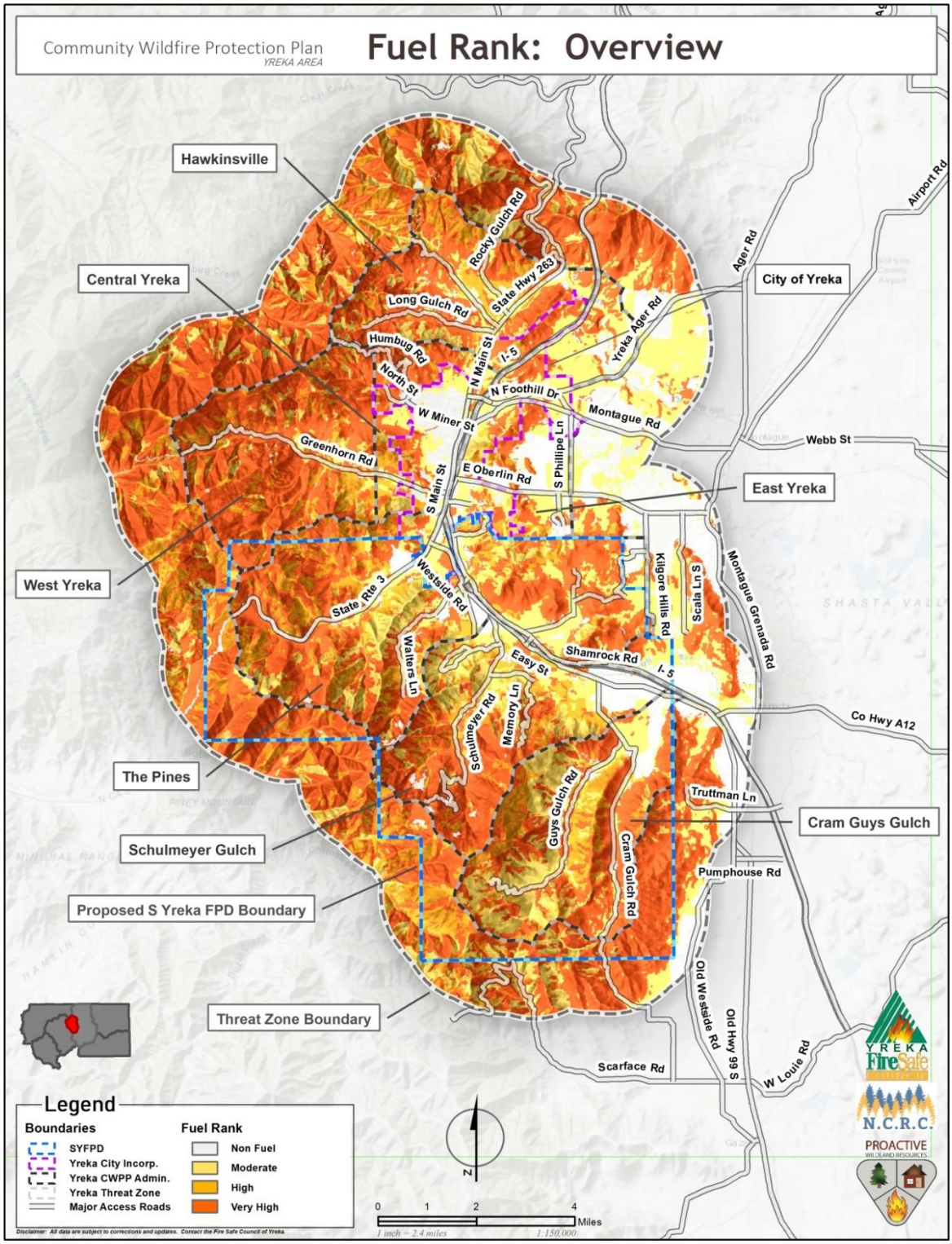
Wildland Fire Threat is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create four Fire Threat classes. Fire threat is used to estimate the potential for impacts (risk of a wildfire) on various assets. (FRAP Forest and Range 2003 Assessment on-line technical report "Trends in Wildland Fire"). Figure 13 depicts the Yreka Area's Wildland Fire Threat.

Figure 11. *Fuel Models – Yreka Area*



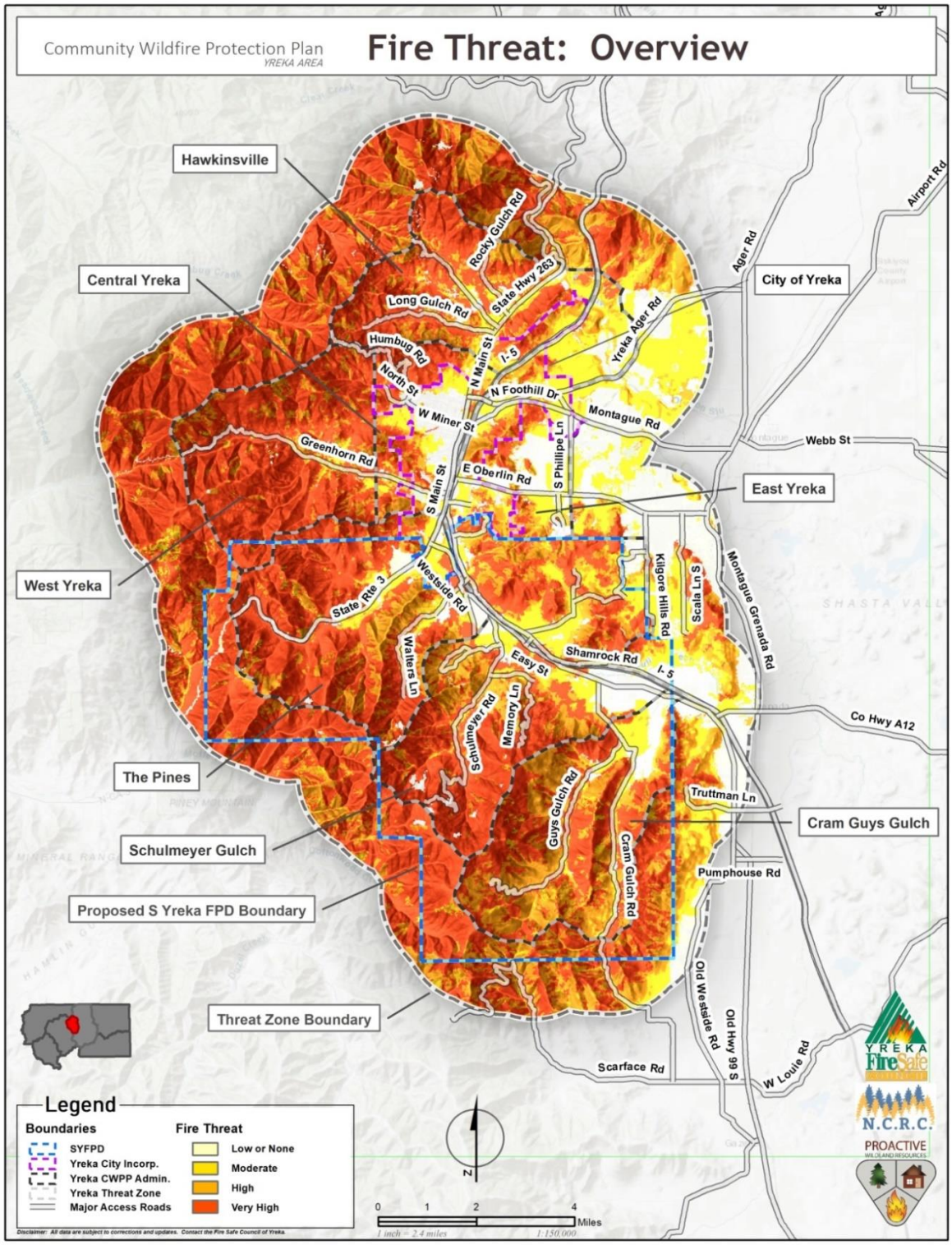
# Acres / % Acres of Primary Fuel Types – Yreka Area							
	Grass	**Grass-Shrub**	**Shrub**	**Timber Litter**	**Timber Understory**	**Non-Burnable**	**Grand Total**
# Acres	27,634	21,171	10,357	18,145	17,476	11,909	**106,691**
% Acres	25.9%	19.8%	9.7%	17%	16.4%	11.2%	**100%**

Figure 12. *Fuel Rank – Yreka Area*



FUEL RANK CATEGORIES BY ACRES AND PERCENT ACRES					
	Low-Non-Burnable	**Moderate**	**High**	**Very High**	**Grand Total**
# Acres / % Acres	1,053 / 2.0%	13,980 / 26.0%	9,902 / 18.5%	28,777 / 53.6%	**53,712 / 100%**

Figure 13. *Wildland Fire Threat - Yreka Area*



Wildland Fire Threat by # / Acres and % Acres					
	Low-Non-Burnable	**Moderate**	**High**	**Very High**	**Grand Total**
# Acres / % Acres	1,052 / 2%	6,944 / 13%	14,049 / 16%	31,661 / 59%	**53,706 / 100%**

5.3 RISK AND BURN PROBABILITY

Burn probability is used to display the potential for an area's vegetation to burn. Historical fire events aid in reviewing where fires have occurred and how they burned. Burn probability adds the dimension of seeing where fire is likely to burn given random ignitions across the landscape.

Wildland fire ignitions are categorized as natural or human caused. As a whole, lightning is the primary natural source of large wildfires as they frequently occur in isolated remote areas and can occur at a rate that overwhelms the number of firefighting resources available.

Human caused fires are frequently started in lower elevations and areas of high human occupancy or use. 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 lower slope WUI ignitions are rapidly turning into deadly and/or highly damaging wildfires; far too often experienced in California's expanding WUI environment.

Wildfire 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)

Wildfire 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)

Randomized Wildfire Ignitions

To develop burn probability models, 25,000 randomly-placed ignitions were analyzed across the Yreka Area, indicating an overall picture of the area's susceptibility to fire. Fires were permitted to burn for two burning periods with no suppression actions. These ignitions were then modeled for two ends of the fire season spectrum (Early Fire Season and Late Fire Season), defined below and used for several comparative analyses and figures throughout the remainder of this CWPP.

Early Fire Season compared to Late Fire Season

The fire season can be defined by four primary fire behavior/fire danger periods: low/moderate, high, very high, and very high/extreme. The four periods are defined by historic weather conditions broken into percentile classes. For example, if the 97th percentile of temperature is 100 degrees, this means 97% of days analyzed are equal to or cooler than 100 degrees. Conversely, only 3 days had a temperature at or above 100 degrees. Percentile weather conditions were analyzed based on the historical fire season (May 1st to October 31st) over a 10-year period (2008 to 2017). For this CWPP, only the following two fire behavior/danger periods were used for analyses outputs; they were deemed the most relevant given the changes to the fire season wrought by drought and weather conditions noted earlier.

Early Fire Season
(60th Percentile Weather)

Corresponds to "high fire danger periods"

60th percentile weather conditions are the point when suppression efforts start to become difficult due to an area's propensity to burn beginning to increase.

Late Fire Season
(97th Percentile Weather)

Corresponds to "very high/extreme fire danger periods"

97th percentile weather conditions are increasingly common as fire seasons are becoming longer, hotter and drier. These conditions occur late summer through late fall and are characterized by hotter, more quickly advancing wildfires, with greater probabilities of severe wildfires.

Burn Probability

Burn probability is calculated by dividing the number of times an area (pixel) burns by the total number of simulations. Therefore, an area that burned two times (out of four) has a 50% probability of burning, whereas an area that burned three times has a 75% burn probability.

Burn probability modelling results support: a) reducing hazardous fuels in select areas, b) the need for homeowners to ensure defensible space and home hardening, and c) the need for aggressive initial attack suppression by firefighting agencies.

Burn Probability - Early Fire Season

Early in the fire season, fuels predominant in the Yreka Area are not as burnable. Grass is typically not yet dry. Brush is typically in growing stage with ample moisture. Modeling early season fire confirms that fires are not likely to grow large and are easier to contain. The average size of the modeled fires was 8.47 acres, and the maximum size was 28 acres.

Burn Probability - Late Fire Season

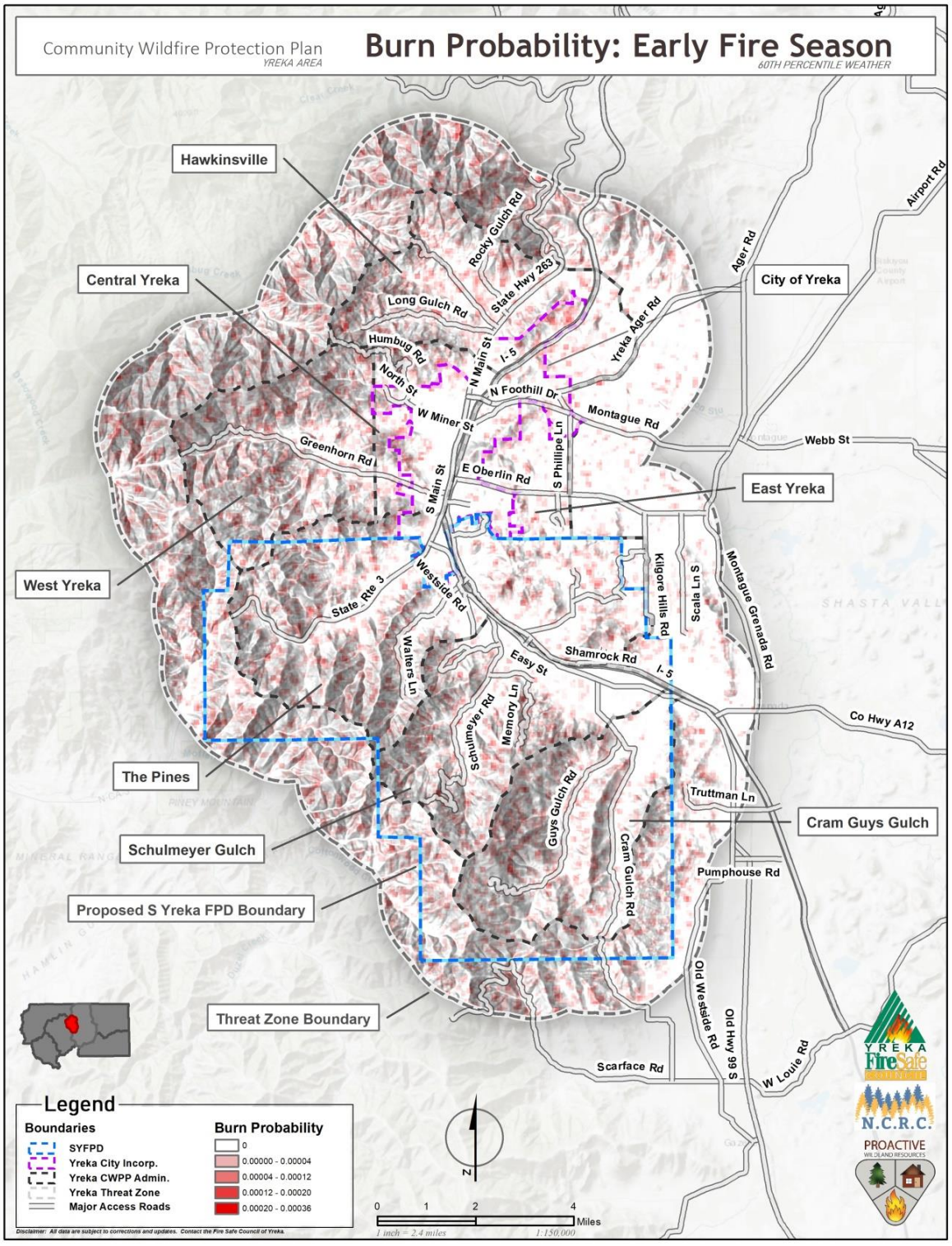
As the fire season progresses through the late summer and into fall, fuels increase in their flammability due to increased heat and lower humidity. As such, fires will burn more aggressively, become larger, and require more firefighting resources for containment. The results of the 25,000 modeled ignitions provide strong data supporting the importance of improving home defenses and for aggressive initial attack suppression actions. The following section further supports this conclusion with identifiable areas of concern. The average size of the fires modeled was 2,134 acres, and the maximum size was 16,224 acres.

For the Yreka Area, burn probabilities for early and late fire season were analyzed and the results are depicted in Figure 14 and Figure 15. The darker reds indicate a greater probability for an area to burn.

Fire sizes were categorized by a fire size classification system used by all wildland fire agencies (National Interagency Fire Center).

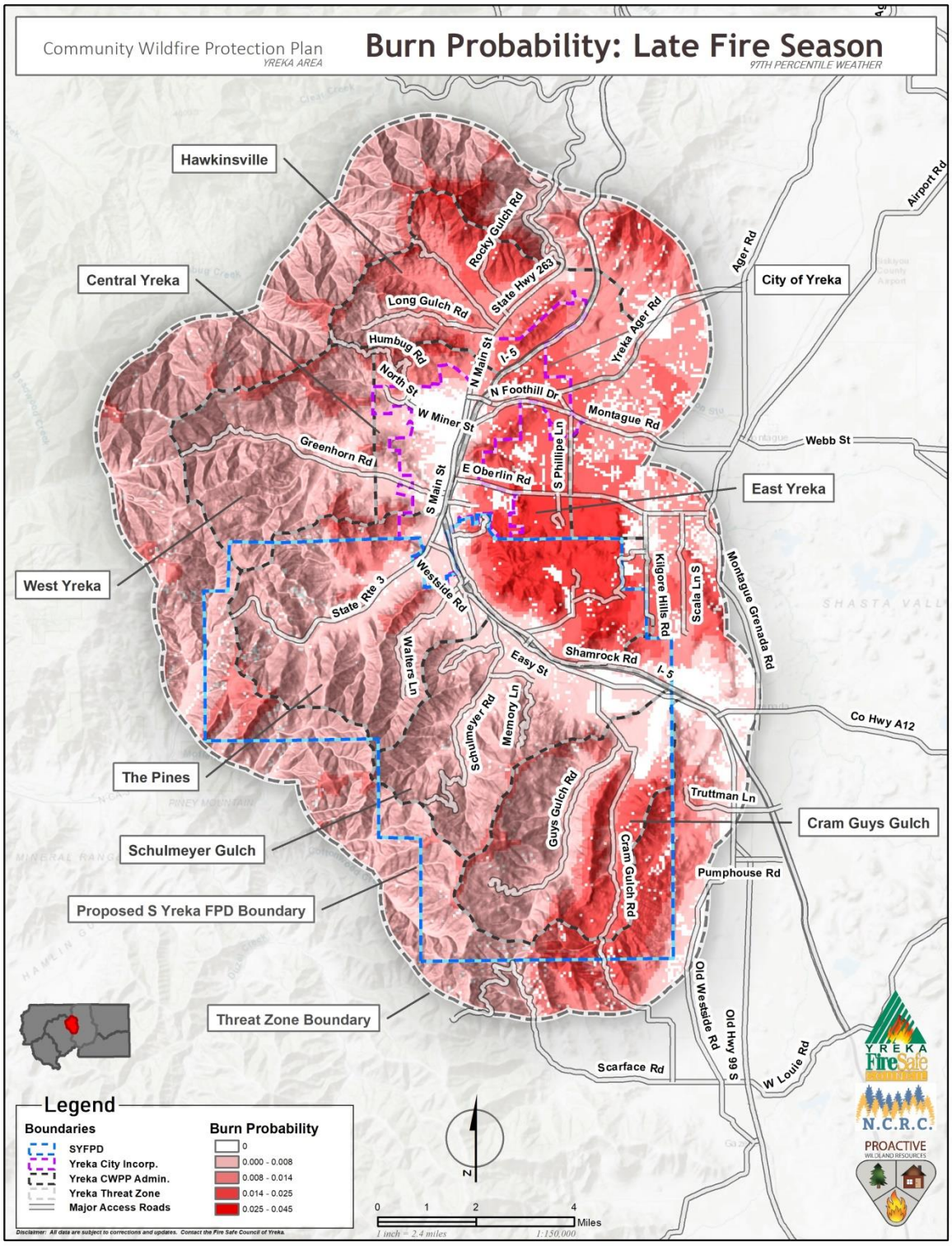
Fact: 64% of Yreka Area's burnable areas are comprised of grass, grass-shrub, and shrub.

Figure 14. *Burn Probability – Early Fire Season*



Number of Modeled Fires by Fire Size Class: Early Fire Season							
	Class A: 0 to .25 acres	**Class B: .25 to 10 acres**	**Class C: 10 t0 100 acres**	**Class D: 100 to 300 acres**	**Class E: 300 to 1,000 acres**	**Class F: 1,000 to 5,000 acres**	**Class G: 5,000 plus acres**
Number of Fires		25,000 / 100%					

Figure 15. *Burn Probability – Late Fire Season*



Number of Modeled Fires by Fire Size Class: Late Fire Season							
	Class A: 0 to .25 acres	**Class B: .25 to 10 acres**	**Class C: 10 t0 100 acres**	**Class D: 100 to 300 acres**	**Class E: 300 to 1,000 acres**	**Class F: 1,000 to 5,000 acres**	**Class G: 5,000 plus acres**
# of Fires / % Fires	0 / 0%	171 / 0.7%	178 / 0.7%	485 / 1.9%	7,393 / 29.6%	14,774 / 59%	1,999 / 8.0%

5.4 INITIAL ATTACK SUPPRESSION OPPORTUNITY

5.4.1 Fireline Intensity (Flame Length)

Firefighters assess fireline intensity (heat at flaming front) by flame length (FL). Longer flame lengths increase heat intensity and therefore suppression task difficulty. Table 8 contains a wildfire control and suppression guide based on flame length that has been established by research and practitioners, and Figure 16 and Figure 17 model and contrast typical FL conditions for the Yreka Area during Early Fire Season and Late Fire Season.

Table 8. *Fire Suppression Interpretations based on FL and FLI*

Flame Length	Interpretations
Less than 4 feet	Fires can generally be attacked at the head or flanks by firefighters using hand tools. Handline should hold fire.
4 to 8 feet	Fires are too intense for direct attack on the head with hand tools. Handline cannot be relied on to hold the fire. Dozers, tractor-plows, engines and retardant drops can be effective.
8 to 11 feet	Fire may present serious control problems: torching, crowning, and spotting. Control efforts at the head will probably be ineffective.
Over 11 feet	Crowning, spotting, and major fire runs are probable. Control efforts at the head of the fire are ineffective.

5.4.2 Rate of Spread

Another key factor is how fast a fire travels, which directly affects fire suppression resource capability to contain or slow a wildfire's advance. Wildfire rate of spread (ROS) is expressed in chains per hour (ch/hr); a chain is 66 feet. Figure 18 and Figure 19 model and contrast typical ROS conditions for the Yreka Area during Early Fire Season and Late Fire Season.

5.4.3 Initial Attack Suppression Opportunity

Flame length and rate of spread are brought together in the Initial Attack Suppression Opportunity Model (IASO). Simply stated, if a wildfire is too hot and advancing too quickly it can be difficult to impossible to contain until conditions or circumstances change. Figure 20 and Figure 21 depict Early Fire Season and Late Fire Season comparisons in suppression likelihood. As the colors trend from green/yellow towards orange/red, resistance to containment increases. Below the figure, a table provides the total number of acres, percentage of acres, and number of structures for each containment category (i.e., non-burnable, containable, unlikely to contain). Location of structures is also included, but are difficult to discern at the Yreka Area level; Section 5.4.4 below describes additional analysis undertaken at the Planning Area level to make structure location more clear.

5.4.4 Structures and Wildfire Suppression Concerns

To arrive at additional actionable data for each Planning Area, analysis was prepared utilizing a structure location layer superimposed onto the (IASO) methodology, resulting in "Structures at Risk" maps. This level of analysis enables the discernment of areas of special consideration for area residents and landowners. Microsoft's U.S. Building Footprint product (Microsoft 2018) was utilized to provide a sense of structure location and better understand potential threats from hazardous fuels and wildfire damage. See *Part 6. Action Plan*, along with IASO and Structures at Risk maps per Planning Area, for opportunities for mitigation work adjacent to structures.

Figure 16. *Flame Length – Early Fire Season*

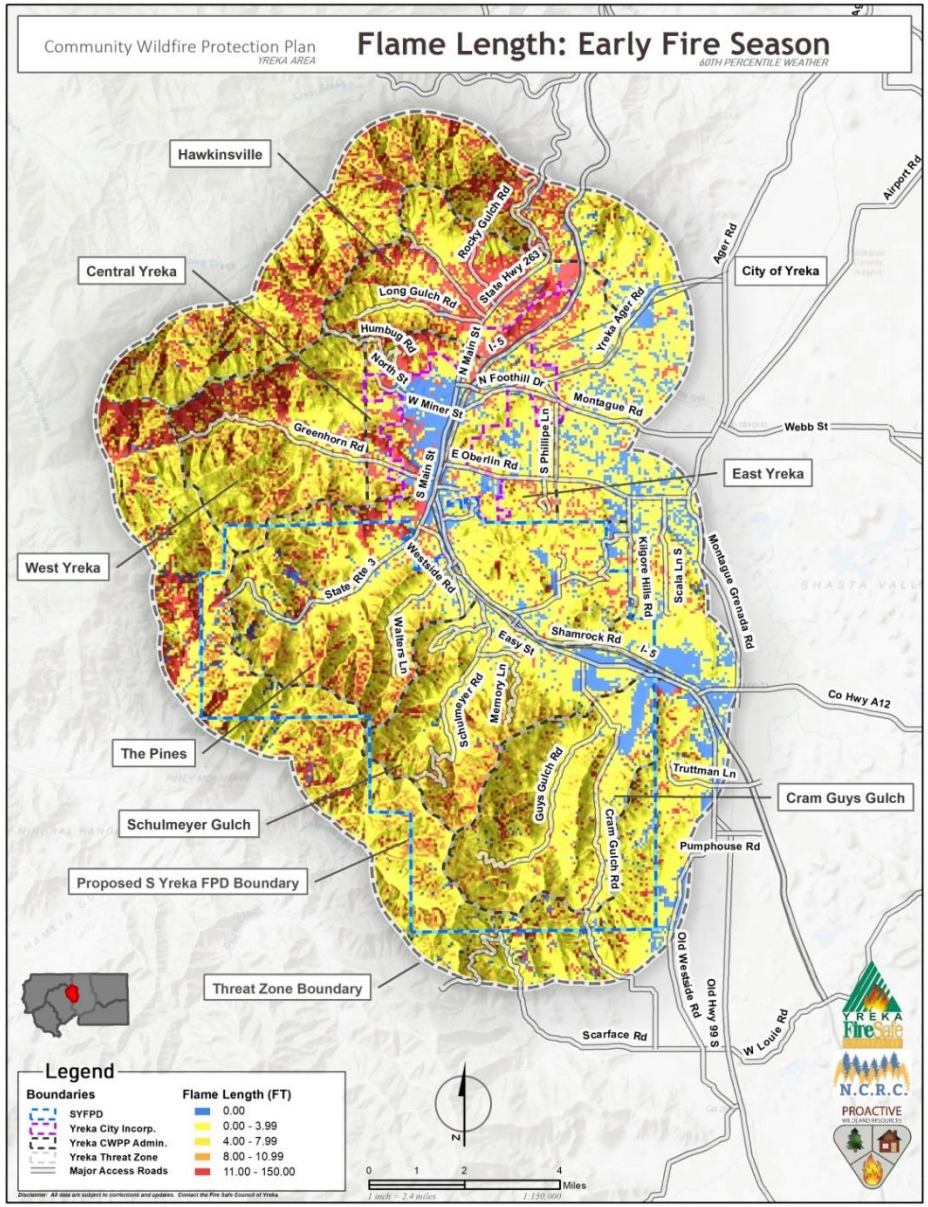


Figure 17. *Flame Length – Late Fire Season*

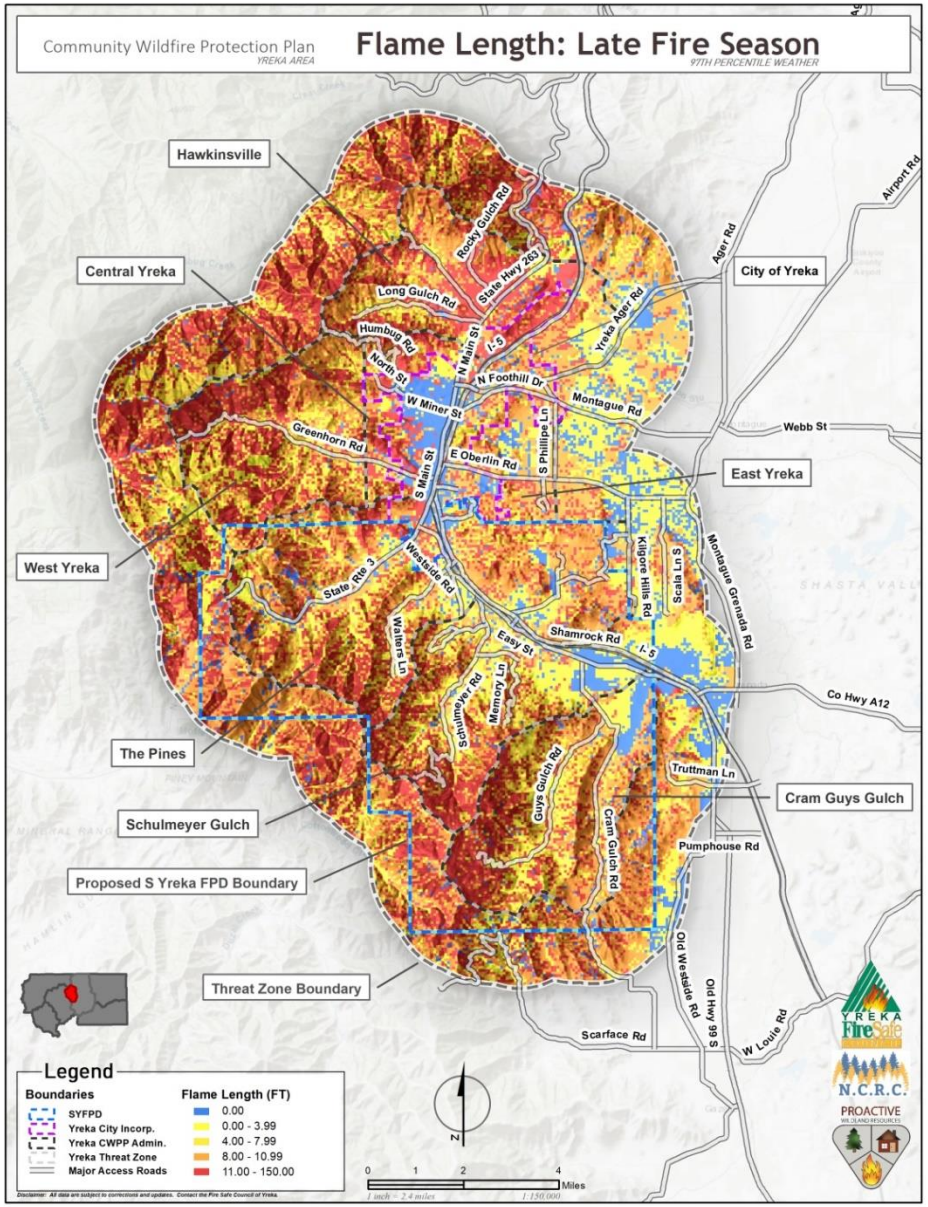


Figure 18. *Rate of Spread – Late Fire Season*

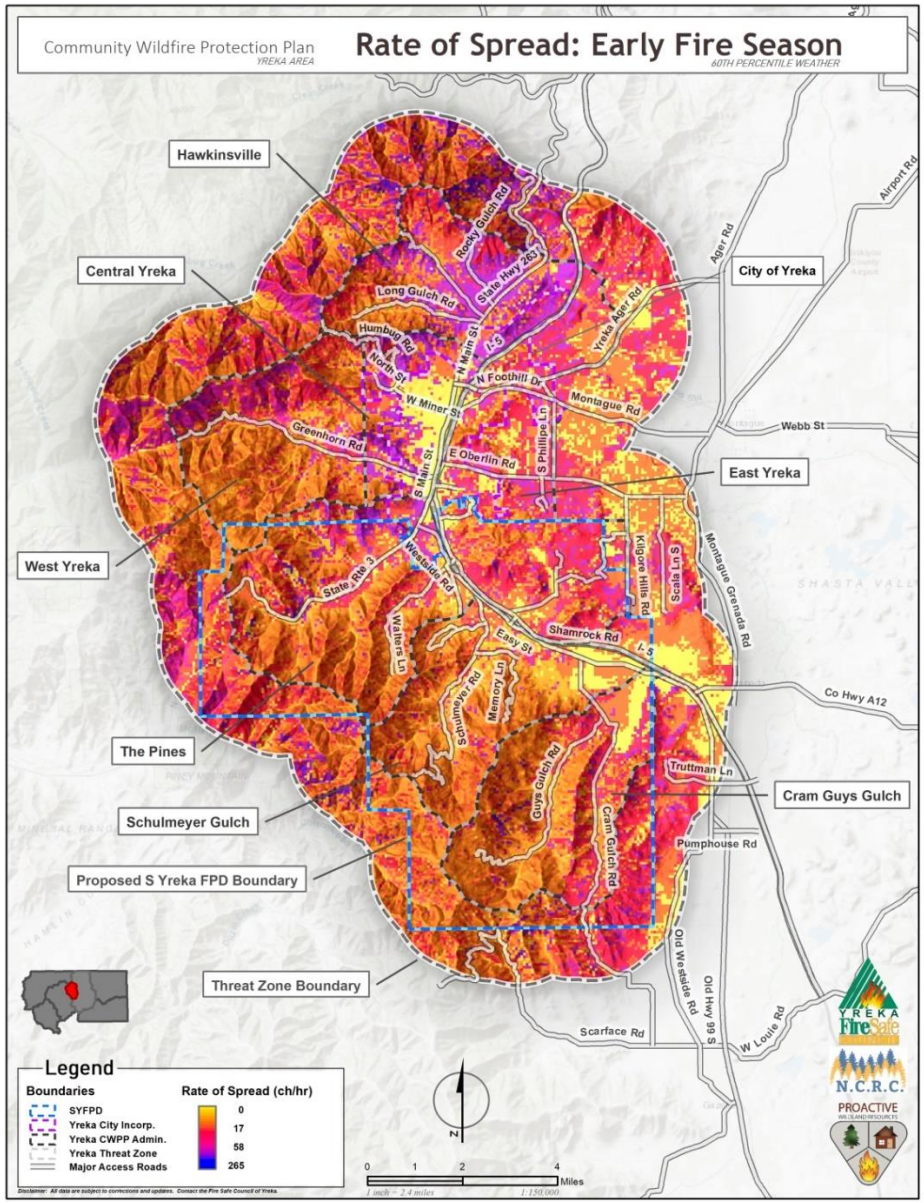


Figure 19. *Rate of Spread – Late Fire Season*

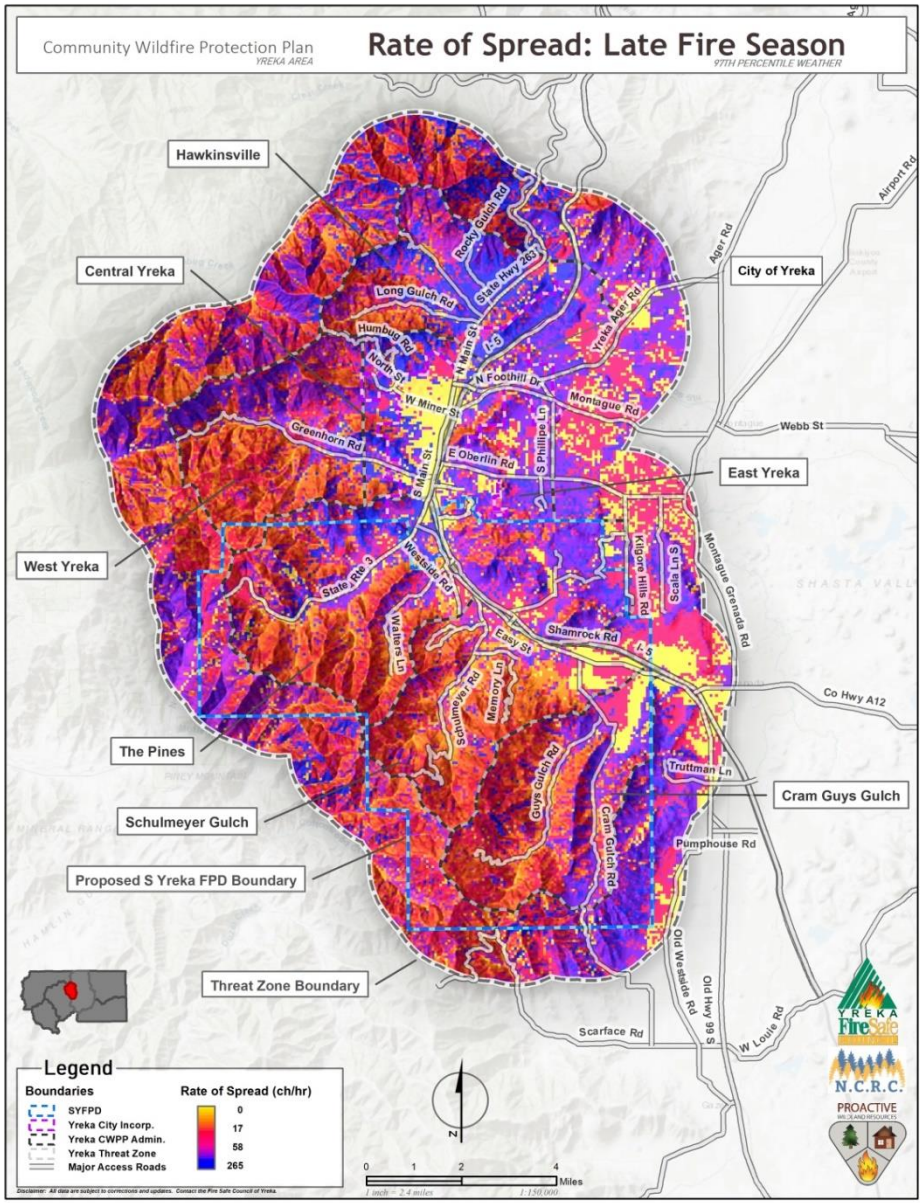
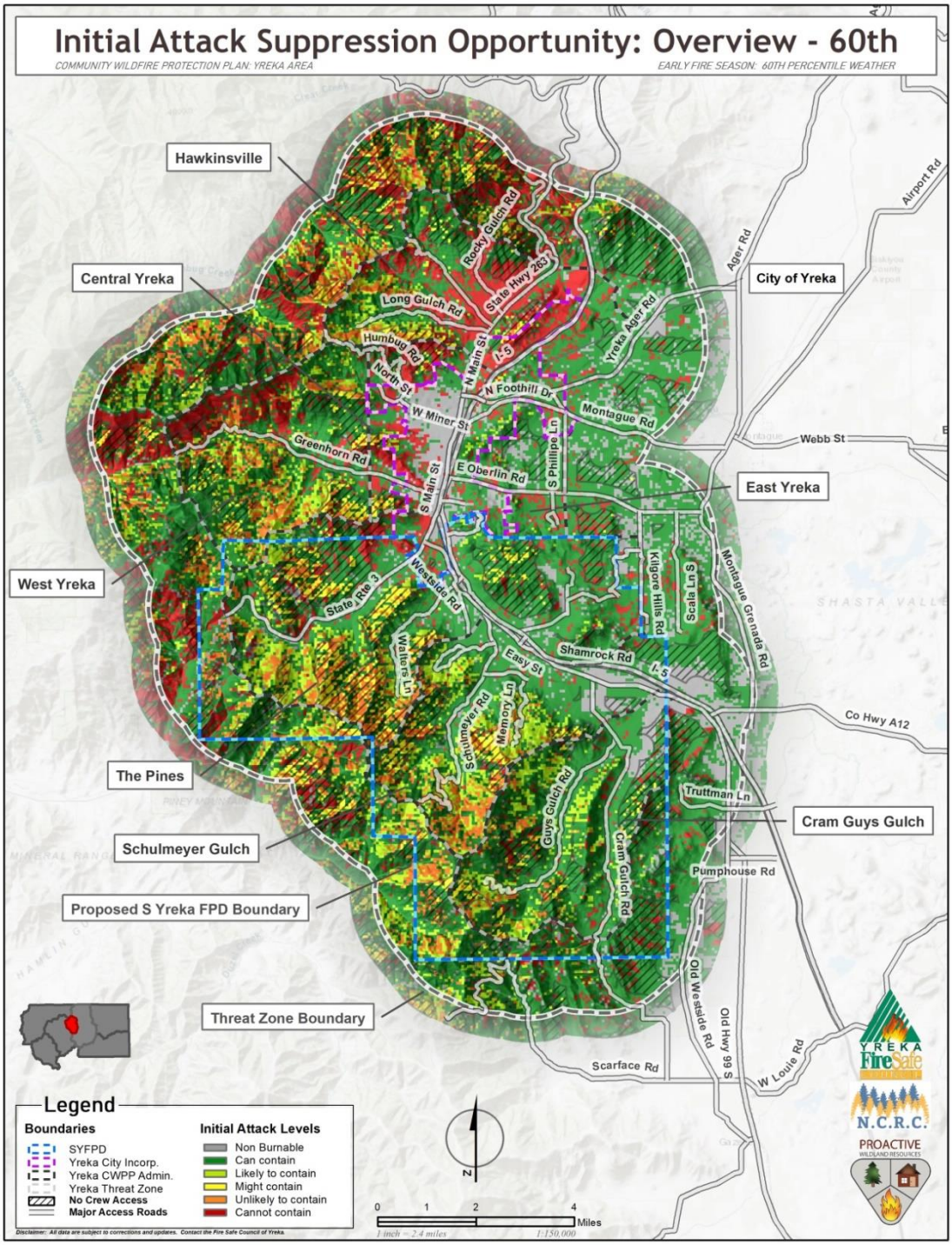
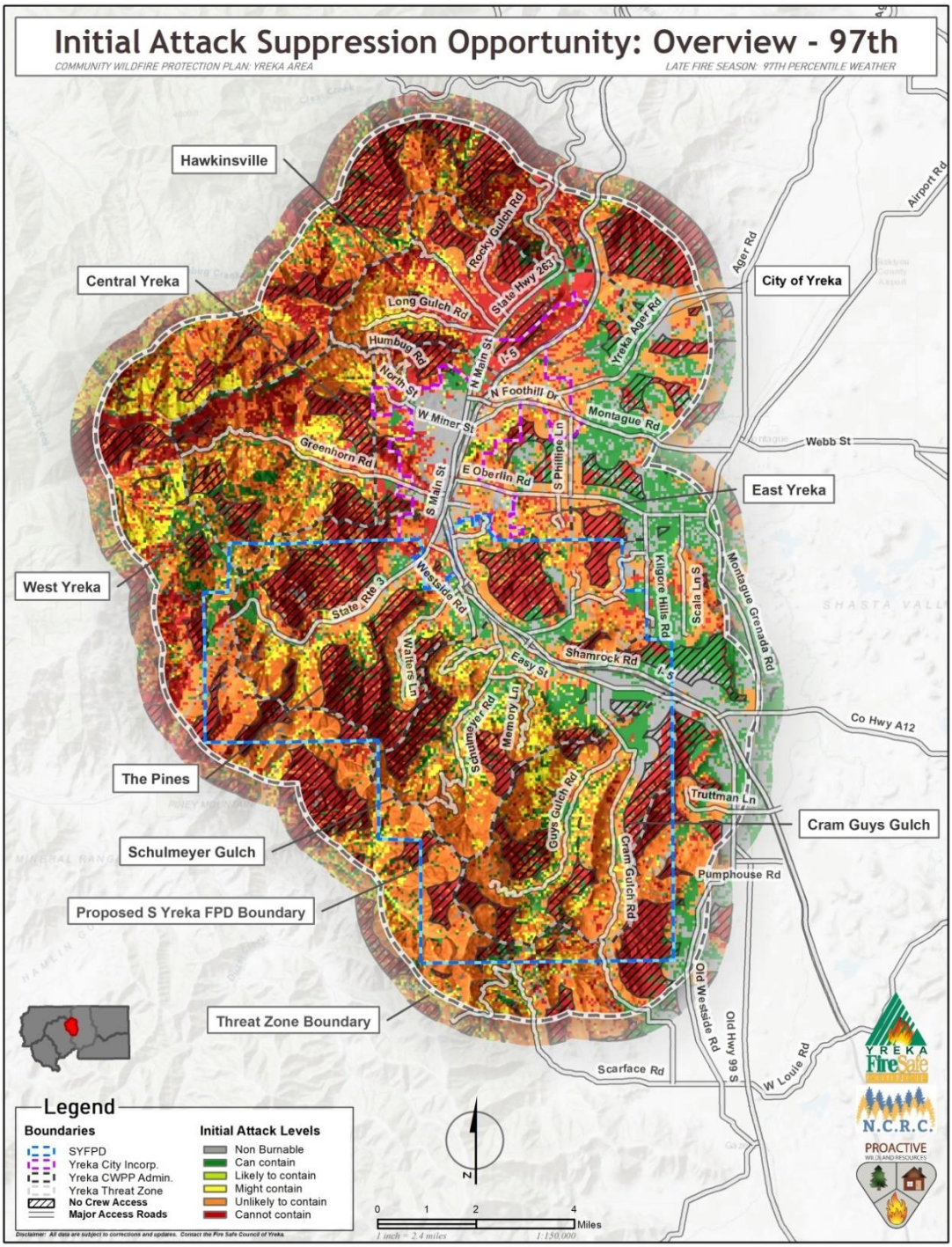


Figure 20. *Initial Attack Suppression Opportunity – Early Fire Season*



Initial Attack Probability of Containment by # of Acres / % Acres / # of Structures - Early Fire Season							
	Not Modeled	**Can Contain**	**Likely to Contain**	**Might Contain**	**Not likely to Contain**	**Cannot Contain**	**Total**
# Acres / % Acres	5,420 / 9%	31,635 / 54%	5,871 / 7%	2,936 / 14%	4,068 / 5%	8,423 / 10%	58,353
# of Structures	3,686	2,136	30	1	2	651	6,506

Figure 21. *Initial Attack Suppression Opportunity – Late Fire Season*



Note a more than fourfold increase in the number of acres in orange and red compared to Early Fire Season

Initial Attack Probability of Containment by # Acres / % Acres / # of Structures - Late Fire Season							
	Not Modeled	**Can Contain**	**Likely to Contain**	**Might Contain**	**Not likely to Contain**	**Cannot Contain**	**Total**
Acres / % Acres	5,420 / 9%	8,235 / 14%	0	5,406 / 9%	22,795 / 39%	16,497 / 28%	58,353
No. of Structures	3,686	627	0	299	1,240	654	6,506

5.5 RECENT LOCAL WILDFIRES UNDER VARIOUS CONDITIONS

5.5.1 Background

Wildfire modeling provides a dramatic illustration of how actual fires could have behaved - with potentially much greater impacts - had they occurred at different times of the fire season and under different weather conditions. These models provide another strong argument for being aware and prepared. Two recent human-caused wildfires in and around the Yreka Area – the King and Grade Fires - were modeled under four unique (but common for the area) fire season scenarios. In the model, the fires are permitted to burn without suppression for two burn periods to evaluate burnability of vegetation and assess effects and vulnerability of areas.

The fires were modeled without suppression actions for the following reasons:

1) Suppression actions are situational, consisting of numerous human and environmental variables that cannot be adequately modeled.
2) Observing unsuppressed wildfire spread can be an instructional awareness tool to help fire managers strategize for potential worst-case scenarios, i.e., when fire suppression resources are unavailable.

Key parameters in the models include:

1) Weather: The Brazie Remote Automated Weather Station (RAWS) was used for all weather modeling. This RAWS data best characterizes fire season parameters for the local area that can applied to the historic fires used for this exercise.
2) Fuels Models and Terrain: The Wildfire Decision Support System (WFDSS) populates the scenarios with all forty available standard fuels models and applies terrain conditions as they exist.

The fires were modeled under four weather / time of season conditions as described in Table 9. The red lines in the figures below illustrate the paths of easiest and/or most probable travel and the resulting fire perimeters.

Table 9. *Four common weather / time of season conditions for the Yreka Area*

Condition	Description
ACTUAL	Weather data for the day of the incidents was used to display what the fires would have done had there been no suppression efforts.
LATE SUMMER	This period is characterized by increased dryness of fuels. *Modelling parameters included wind direction primarily out of the southwest and winds aloft at 25 miles per hour (mph). A total of ten burn hours (over two 5-hour periods) was used.*
MID-TO-LATE FALL	California is experiencing prolonged fire seasons. Without the "normal" historical rains that typically came by late fall, it is not unusual to go until early November before significant precipitation slows or ends the fire season. Without rain or an increase in relative humidity, risk of a fire start is increased, and ignitions are potentially exposed to winds from the north/northeast ("Foehn" winds). Foehn winds are strong and typically bring very low single digits relative humidity, often with warm temperatures. *Modelling parameters included Foehn winds out of the northeast at 40 mph. Due to shorter days, the burn period is reduced to a total of eight hours (over two 4-hour).*
STRONG WESTERLY WIND	The Yreka area sometimes experiences frontal passages that bring a strong westerly wind flow from the mountains to the west. There are historical fires that have burned under these conditions. *This scenario maintained the increased fuels dryness of the Late Summer model but applied a 25 mph wind directly out of the west. A total of ten burn hours (over two 5-hour periods) was used.*

5.5.2 King Fire

The King Fire occurred June 26, 2017 at about 12:30pm in an area above the Burger King and the College of the Siskiyous' Yreka Campus. It burned about 19 acres.

Figure 22. *King Fire – ACTUAL*

Figure 23. *King Fire – LATE SUMMER*

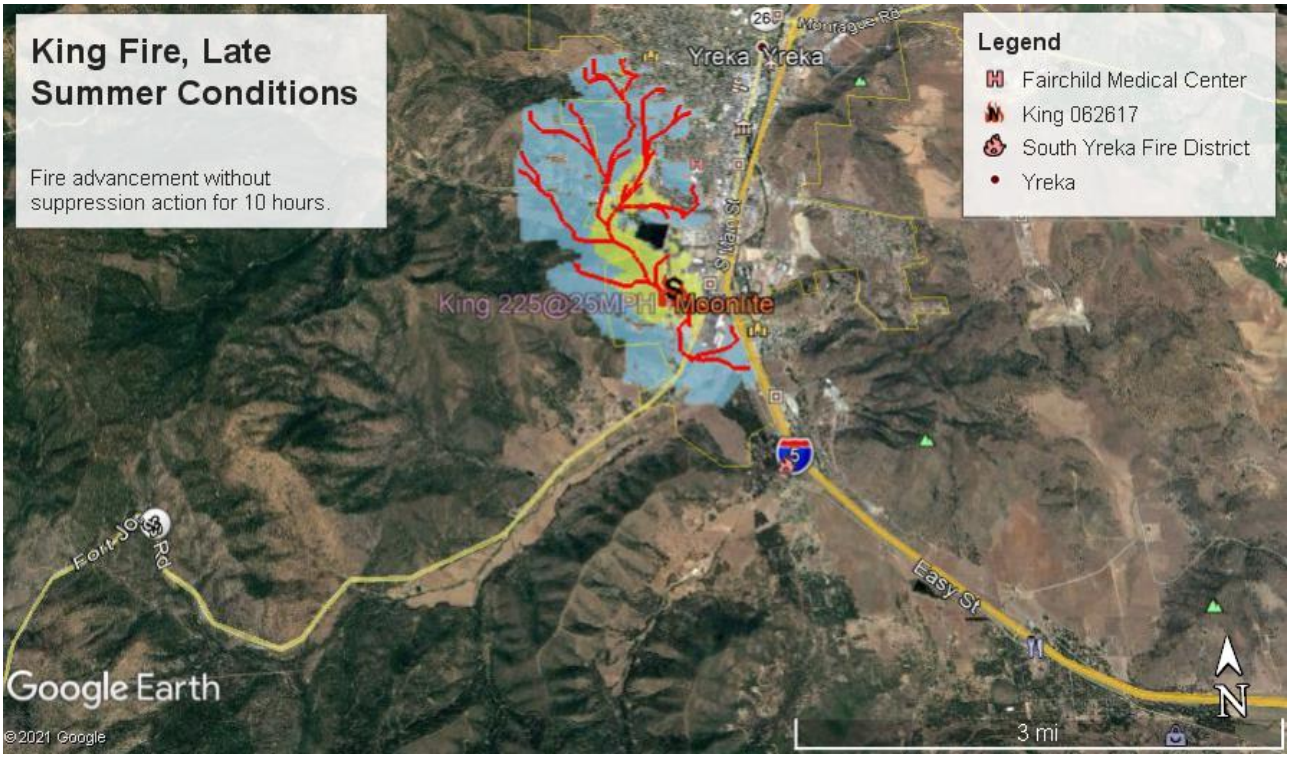


Figure 24. *King Fire – MID TO LATE FALL*

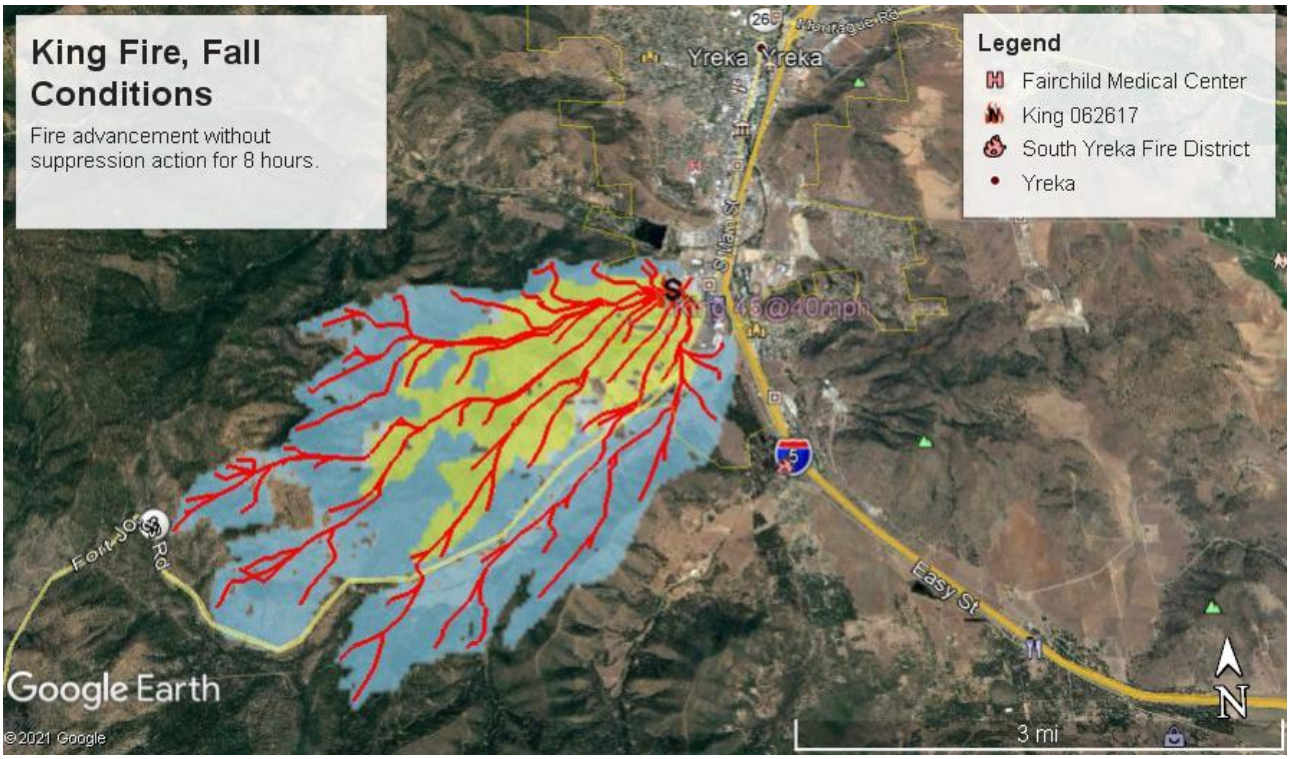
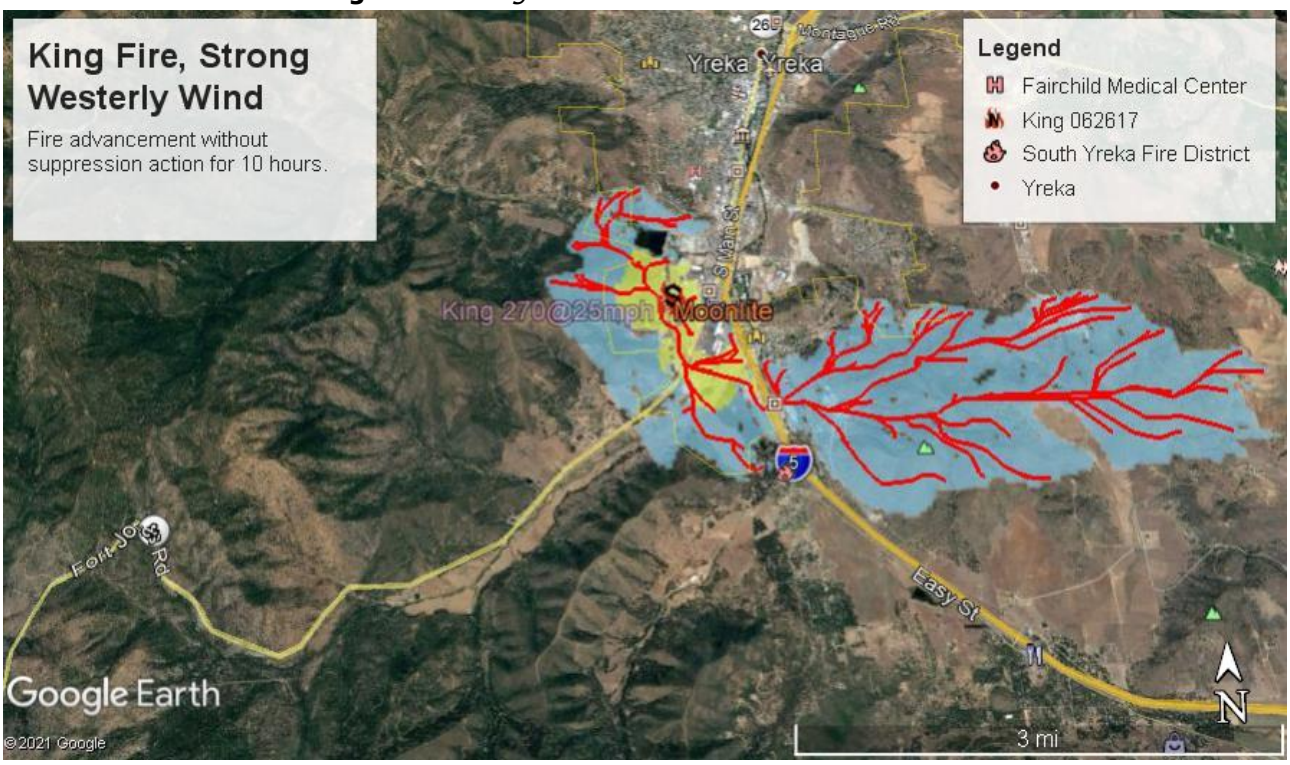


Figure 25. *King Fire – STRONG WESTERLY WIND*



5.5.2 Grade Fire

The Grade Fire began on August 24, 2016 at about 2:55pm. This fire burned as close to a very high fire risk/behavior condition as possible. The fire burned 710 acres and destroyed five residences two miles north of the City of Yreka.

Figure 26. *Grade Fire – ACTUAL CONDITIONS*

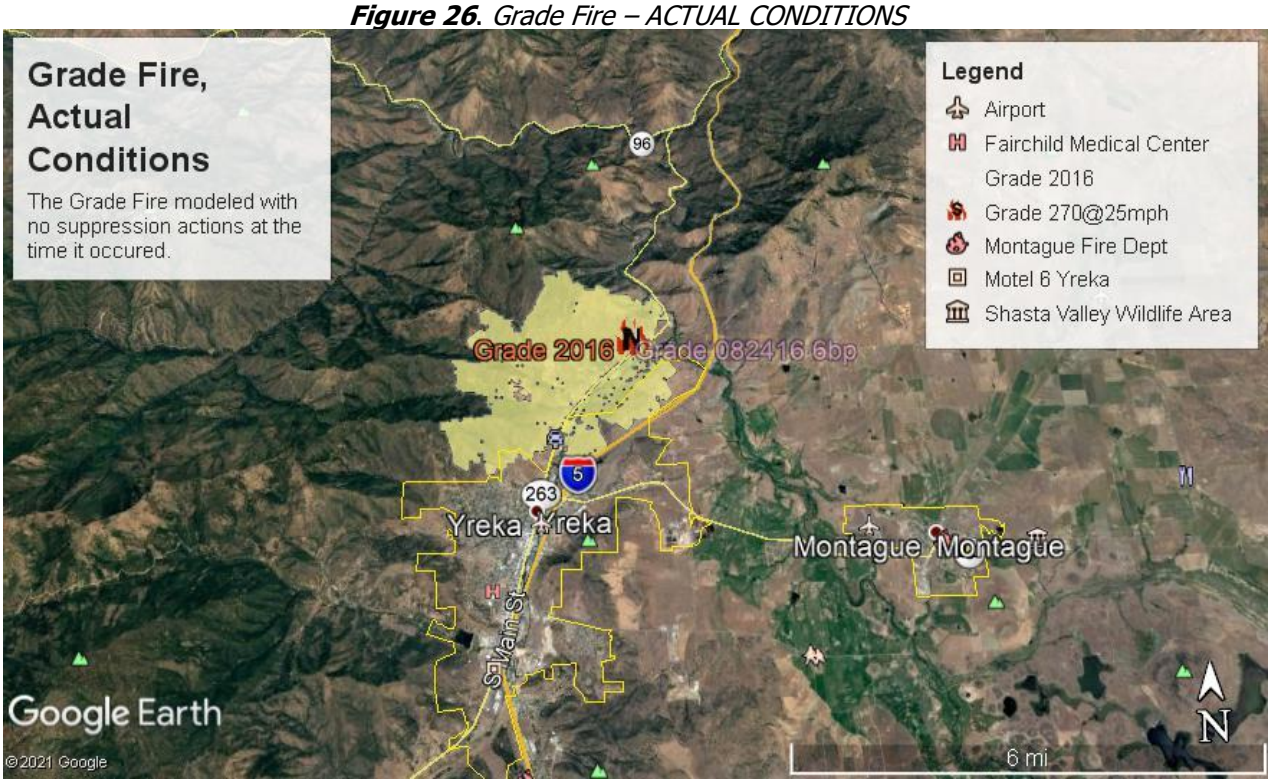


Figure 27. *Grade Fire – LATE SUMMER*

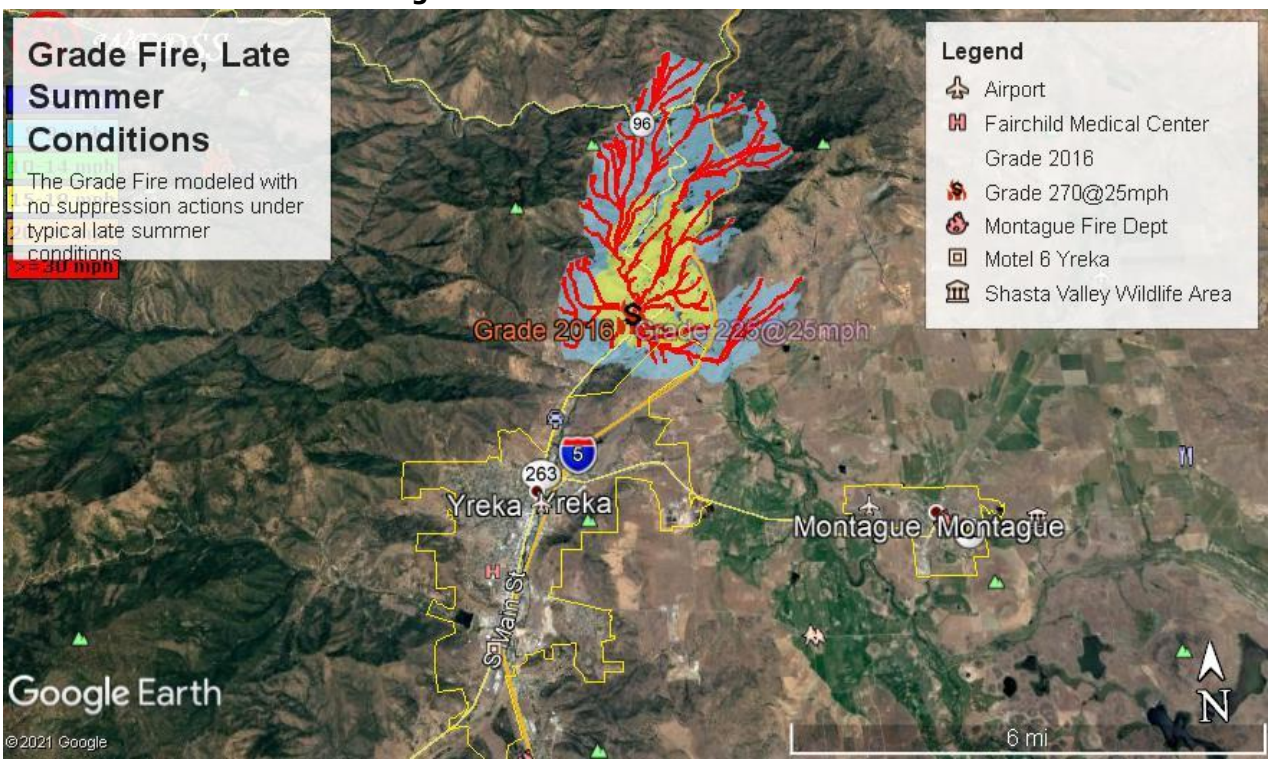


Figure 28. *Grade Fire – MID TO LATE FALL*

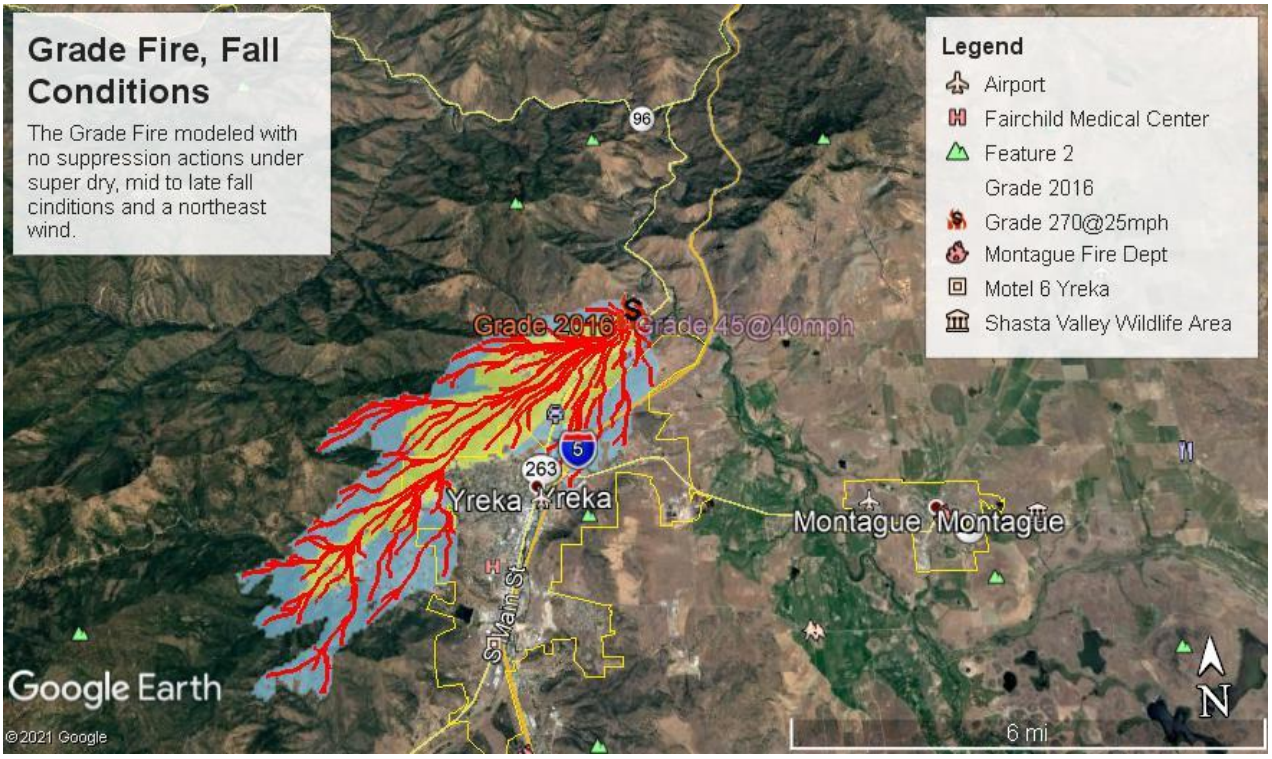
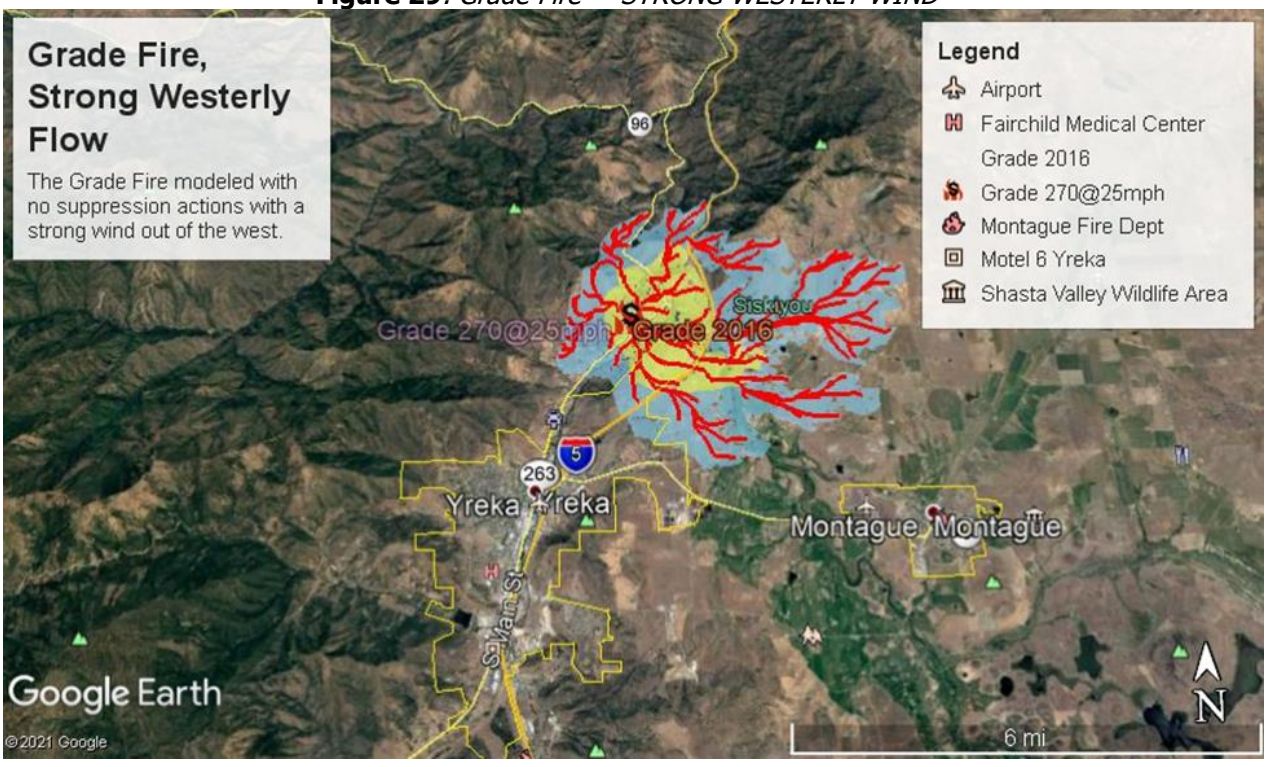


Figure 29. *Grade Fire – STRONG WESTERLY WIND*



This section provides specific information and actionable, achievable guidelines and tools to be proactively used by citizens and fire protection agencies alike. Additional supporting templates and checklists for tracking progress against goals are provided in *Appendix A. Actionable Items* and *Appendix B. Home Hardening and Defensible Space*.

6.1 COMMUNITY PREPAREDNESS ACTIONS

A challenge for Yreka Area communities is maximizing awareness of the wildfire threat and generating sufficient interest to encourage participation in preparedness activities that effect change at the individual and community level. Communication about preparedness actions is necessary to engage citizens before an event escalates.

Preparedness includes a range of actions including community education, reducing structure ignitibility, fuels mitigation, and evacuation preparedness. Several local, state and national preparedness programs are readily available, and citizens are urged to engage with the actions and recommendations contained within them.

6.1.1 Wildfire Preparedness Programs

Listos California

Listos ("Ready" in Spanish) is a community disaster preparedness program initiated by the State Office of Emergency Services. Following devastation in the wake of the last several wildfire seasons, a State Auditor's Report found that the state and OES were not sufficiently prepared for disasters, in particular the disproportionate impact on vulnerable populations. This led to a new statewide program targeted at educating these populations for disaster readiness (including for wildfires).

Disaster 2-1-1

Disaster 2-1-1 in Siskiyou County is a free information and referral service activated by Siskiyou County OES with support from United Way of Northern California to support the community in times of disaster. It connects community members to information about critical disaster related services. It is ONLY available during an active incident of disaster and utilizes both bilingual call specialists and a phone-based translation service.

Ready for Wildfire

This is California's (CAL FIRE) primary set of tools for wildfire prevention and preparedness.

> ***Prevention***: One Less Spark - One Less Wildfire
> An action-based platform that highlights the fact that most wildfires in California are caused by people and establishes why fire agencies need the public's help to prevent them.
>
> ***Preparedness***: Ready, Set, Go!
> A wealth of information and checklists to help residents and families take practical and achievable steps for defensible space, home hardening, and more.

Firewise

Firewise is 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.

Yreka Area Fire Safe Council

The Yreka Area Fire Safe Council (YAFSC) was formed in 2006 by property owners interested in protecting their properties and the surrounding area from catastrophic wildfire. This group was responsible for bringing together landowners and management agencies to participate in the initial development of Yreka Area CWPP, signed in 2013. This Wildfire Protection Plan is considered by the Fire Safe Council to be a "living document" that will continue to evolve as stakeholders make adjustments based on future project and wildfire prevention experiences, as presented in this 2021 updated version.

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.

Fire Danger Ratings

At a national level, the fire protection 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:

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 to specific neighborhoods, an entire community or the entire county. The emergency messages can be distributed at a rate of 1,000 calls per minute. CodeRED engages a unique internet mapping process 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.

Register with Code Red	Download the CodeRed Mobile Alert App
CODE RED	CODE RED Get it now...

Online and Social Network Resources

There are multiple social network avenues for acquiring information on emergent wildfire and/or evacuation situations. These networks are commonly referenced to keep citizens and interested parties up to date on events, advisories, and alerts. Primary notification entities include:

- Siskiyou County Scanner
- Siskiyou Alerts (Fire and Emergency)
- Siskiyou County Grapevine
- Siskiyou County Fire Chiefs Association Facebook
- Yreka Area Fire Safe Council Website
- Yreka Area Fire Safe Council Facebook
- Fire Safe Council of Siskiyou County Website
- Fire Safe Council of Siskiyou County Facebook
- Siskiyou County Sheriff Facebook
- Siskiyou County Sheriff Twitter
- CAL FIRE Siskiyou Unit Website
- CAL FIRE Siskiyou Unit Facebook
- CAL FIRE Siskiyou Unit Twitter
- Siskiyou County Office of Emergency Services Website
- Siskiyou County Office of Emergency Services Facebook
- CHP Yreka Area Website
- CHP Yreka Area Facebook
- CHP Yreka Area Twitter
- Klamath National Forest
- 211 NorCal

Radio Stations and Communication Broadcast Systems

To hear emergency broadcasts on AM, individuals may need to listen from a battery powered portable radio or car radio. FM stations also broadcast emergency events but are limited to localized vicinities. During an emergency, all radio networks (AM and FM) will broadcast out with notable alert tones (Emergency Broadcast System) and provide critical information including information sources such as agency website, social networks or phone numbers.

Live scanner applications or electronic broadcasting are other emergency communication sources accessed via computer or mobile device. Scanner tools offer 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 only (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 other alerts/events, including wildfire.

The following list includes information for area radio and communication broadcast systems:

- AM-1610: Utilized for Highway Emergency situations
- NOAA-NWS: Emergency Alert System coverage and code information
  - Code information
- Radio Stations (can query by specific location)
- Example scanner tools/applications:
  - Broadcastify
  - Scanner Radio (Fire and Police)

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 Website
- Siskiyou Daily News Facebook
- Mount Shasta News Website
- Mount Shasta News Facebook
- KOBI-5 News (NBC) - Medford, Klamath Falls – Website
- KOBI-5 News (NBC) - Medford, Klamath Falls – Facebook
- KRCR News Channel 7 (ABC) – Redding – Website
- KRCR News Channel 7 (ABC) – Redding – Facebook
- KDRV Newswatch 12 (ABC) – Medford – Website
- KDRV Newswatch 12 (ABC) – Medford – Facebook
- KTVL News Channel 10 (CBS) – Medford

6.1.3 Emergency Services

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 and

counties. As size or complexity increases, additional state and national level resources will respond.

City of Yreka Emergency Information

The City of Yreka website provides an Emergency Information link. This includes readily available resources that address: 1) Disaster Relief Guidance (e.g., Listos), 2) Public Works Emergencies, 3) Local Conditions (e.g., weather and roads), 4) Emergency Notifications, 5) Other Agencies and Resources and 6) Wildfire Information

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. The OES Website contains an updated (2020) reference Siskiyou County Emergency Preparedness Guidebook which provides local information sources for emergency planning and preparation tasks.

American Red Cross of Gold Country Region

The Yreka Area resides in the Northeastern California Chapter of the Gold Country Region which covers 14 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.

The Red Cross website provides information and tools to assist in emergency and disaster relief preparation for the Gold Country Region.
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

Animal Disaster Evacuation

Local agencies have limited resources, so pre-planning for safe evacuation of pets and livestock is essential. Below are links for specific guidance and planning.

- Pet Emergency Checklist
- Livestock Disaster Preparedness Guidelines

6.2 VALUES PROTECTION ACTIONS

A primary goal of any CWPP is to enable and facilitate the development of community action plans tailored to ensure protection of the community's principal values (see *Section 3.3* for the Yreka Area's stated priorities for values protection). This section details specific considerations and actions for values protection.

6.2.1 Strengthen Life Safety

As stated earlier, the Yreka Area's top Values Protection priority is life safety. When a wildland fire moves into a WUI, fire threat levels escalate, triggering an elevated emergency response which directly correlates to imminent danger posed to human lives in the vicinity.

Hazardous conditions can limit safe access by fire personnel and inhibit their ability to take suppression actions. California wildfires in 2017, 2018 and 2020 impinged on the WUI with disastrous effect, and illustrate profound survival warnings:

1) Property owners need to evacuate when directed to do so.
2) WUI structures and assets need resilience to withstand wildfire on their own.

Firefighting forces responding to an incident begin an assessment or "triage" as they approach the scene. This initial triage consists of quick, concise decisions based on critical safety factors and intended to manage or mitigate the level of risk for safe engagement in suppression actions. Elements essential to both citizen and firefighter life safety in WUI scene operations include adequate route clearance (hazard fuels and power lines) for access and egress; structure/improvement characteristics to decrease vulnerability to fire; hazardous material issues; adequate water sources; and adequate defensible space.

Both firefighters and citizens should understand the critical importance of safe separation concepts. Research clearly shows that the added flammability and heat indices of burning structures, onsite utilities, combustibles and other hazardous fuels in and around structures *significantly increase* fire intensities that threaten life safety of firefighters and property owners.

Each citizen's local knowledge of what comprises a safe distance can also be critical during a rapid evacuation situation. The element of safe distances directly correlates to evacuation situations (see *Section 6.4*). Additional Safety Zone Research information is available here.

6.2.2 Reduce Home/Structure and Access Ignitability

Overview

There simply are not enough fire engines or fire personnel to protect every home, structure and access route in the Yreka Area during a wildfire emergency. Many WUI residences in the area are

> Property owners hold primary responsibility to ensure that their properties can withstand wildfire, and are mandated by law to reduce structure vulnerability and provide defensible space in many portions of the Yreka Area.

not safe for firefighters to engage in structure protection. Property owners are responsible for

safe clearance *before* a wildfire occurrence. Even the required 100-foot minimum defensible space around structures may not be sufficient for life safety, as clearly evident in the severe WUI wildfire events of northern California during 2017-2018 and 2020 fire seasons.

Wildfire structure resilience in the Yreka Area's WUI is largely contingent upon susceptibility to ignition, even if firefighters are present. Most actions to reduce the ignition potential of a structure are associated directly with the structure itself, from its foundation to a distance of between 100 to 200 feet from the structure. In some cases, achieving resilience will involve treatment actions beyond 200 feet due to structure location on a slope, terrain steepness, tendency for high winds, vegetation due to density, and expected fire behavior.

Structure composition and defensible space are equally important factors in home ignitions. There are multiple sources providing homeowner specifications and guidance in mitigation actions.

*Note: This section addresses structure and structure access treatments/protection. Roadway access treatments/protection is covered in detail in the *Section 6.3*.

Figure 30 was developed by creating "zones of concern" that extend 300 feet beyond structures where either red or orange shading in the Initial Attack Suppression Opportunity maps (see Figures 20 and 21) highlighted areas of concern. In figure 30, the red and orange polygons indicate the following:

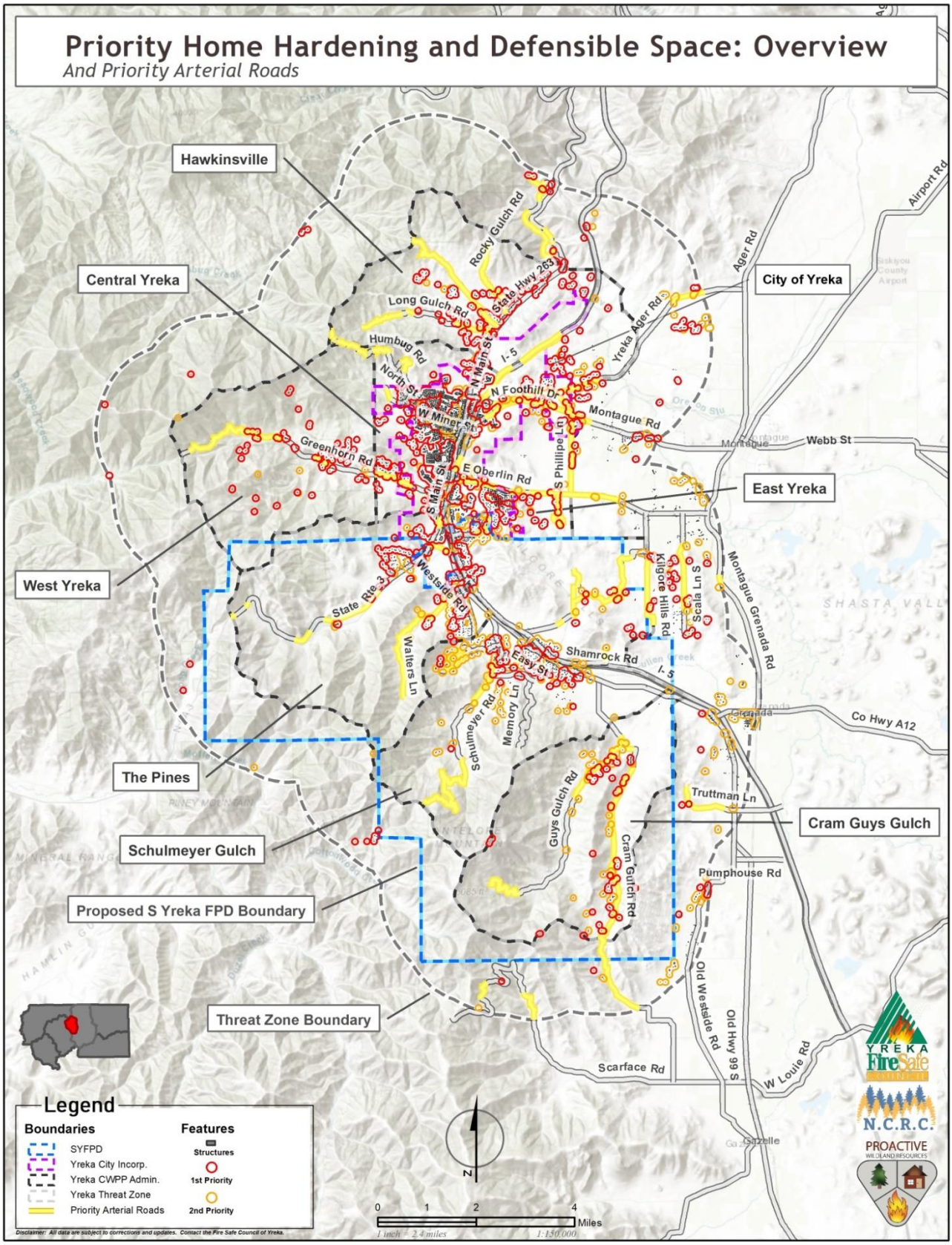
- Red Polygons: These are zones at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in "Not-Likely-to-Contain" and "Cannot Contain" areas in both early and late fire season scenarios.
- Orange Polygons: Modeling identified structures in these areas that will become at higher risk later in the summer and into the fall before the first rains.

The following are recommended actions for these areas:

1. Homeowners should perform all of their home hardening and defensible space work as identified in later in this section and in *Appendix B*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.
2. Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

Figure 30 also highlights primary arterial roads of concern. These road or road segments traverse zones where Burn Probability (see Figures 14 and 15) is mostly red indicating an area that modeling indicates wants to burn. These road segments also run through zones that are either identified as "Not-Likely-to-Contain" and "Cannot Contain" areas. Additional feeder or secondary roads identified as a concern may be found in Appendix D, Figure D.1. Actions to consider are found in Sections 6.3.1 and 6.3.2.

Figure 30. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Home Hardening

During a wildfire, homes can be threatened by 1) wind-blown embers, 2) radiant heat, and 3) direct flame contact. In wildfire events, 60-90% of home loss is due to embers. Embers can originate from an approaching wildfire or small parts of nearby burning vegetation and construction materials. A home composed of and maintained with updated fire-resistant components will significantly decrease the probability of embers igniting upon contact with the home.

Home Hardening: Making a home less susceptible to embers or heat.

There are many things a homeowner can do to harden a home, and this web site is a primary source for detailed information. Taking the necessary measures can increase its likelihood of survival when wildfire strikes. These can range from the simple to the more complex. Every homeowner should assess and prepare their home for wildfire readiness. Ask a fire professional for help determining what you should do. It can be as simple as cleaning the leaves from your eaves or roof, replacing vents or plugging gaps in your roof, or replacing siding with a material rated for fire resistance. This recently released Wildfire Home Retrofit Guide (University of Nevada/USDA, 2020) is an excellent detailed "do it yourself" source of information, as are these Home Hardening Guidelines (UC Cooperative Extension: Fire in California).

Defensible Space

In the Yreka Area's SRA lands, defensible space is mandated by statute (PRC 4291), and CAL FIRE regularly conducts homeowner inspections and facilitates enforcement. Similar inspection guidelines can also be utilized within the LRA/city boundary.

Defensible Space: The buffer you create between a building on your property and the grass, trees, shrubs, or any wildland area that surrounds it.

Creating defensible space is essential to both protecting life safety and reducing structure ignitibility. Having defensible space provides a buffer that is needed to slow or stop the spread of wildfire and allows for safe suppression operations. An excellent resource is available at this CAL FIRE web site. These Defensible Space Guidelines (UC Cooperative Extension: Fire in California) are also very useful.

Defensible space actions should be applied to property infrastructure as well as homes/structures (e.g., water infrastructure such as water tanks, water lines, water storage pumps and pump housing structures).

Defensible Space Zones – A Refined Look

Defensible Space Zones: Recent fire events and research underscore that a third zone - the 0-5 foot zone - is proving to be a critical area for fire treatments.

The severity and scope of catastrophic wildfire events in California in recent years has prompted fire managers and researchers to refine the foundational 2-zone concept (specified in California PRC 4291's Defensible Space Law). This closer look defines imperative protection measures in the

critical zone directly adjacent to the home, typically defined as 0-5 feet. The added guidance supplements the defensible space law with critical and feasible homeowner protection actions and parallels concepts recommended by the National Fire Protection Association (NFPA). The following three figures are examples of this refined zone concept.

Figure 31. *Example: From Oak Hill, CA Fire Safe Council*

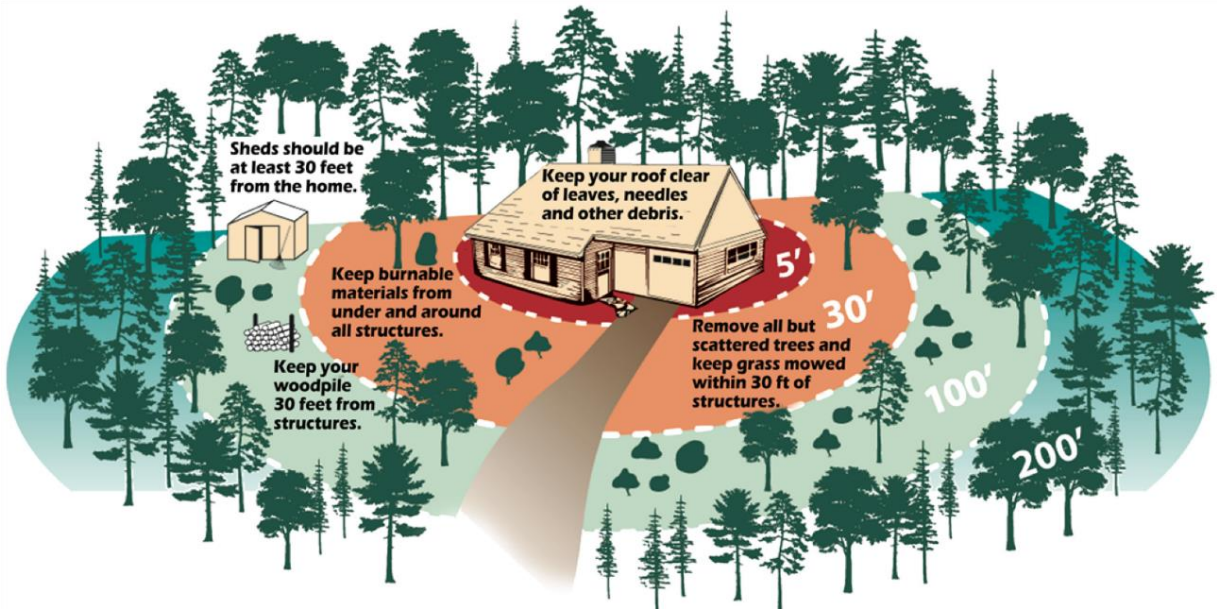


Figure 32. *Example: From Live Oak Wildfire Solutions*

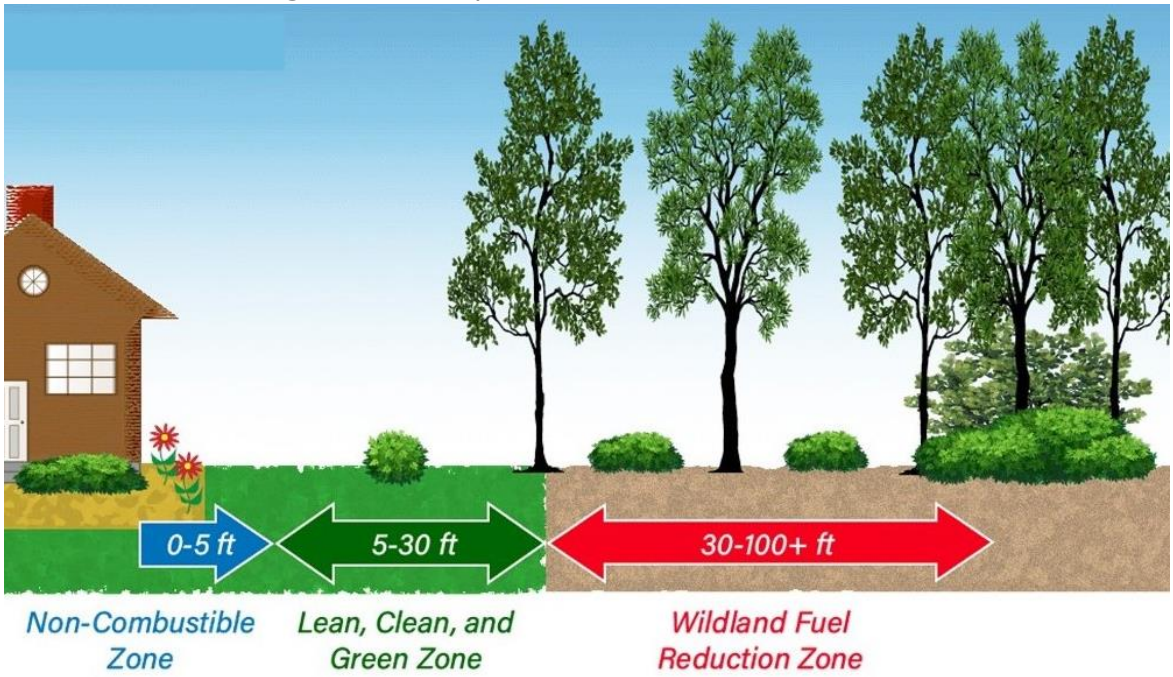
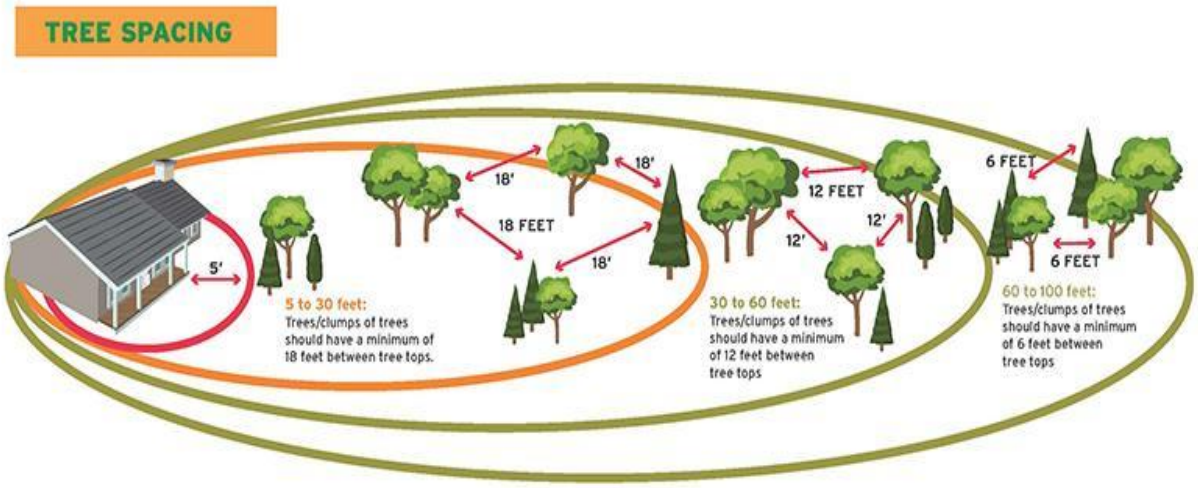


Figure 33. *Example: From National Fire Protection Association*



Firewise Home Ignition Zone (HIZ)

The HIZ tool has been utilized nationally (NFPA, 2015). Within this 200-foot area, there are three zones, depicted in Figure XX with descriptions following the graphic:
Immediate: 0-5 feet; Intermediate: 5-30 feet; Extended: 30-100+ feet

Mitigating risk within the HIZ is important and requires a joint effort if a neighbor's residence is closer than the full 200-foot area. Properly maintained HIZ activity affects the survivability of a neighbor's home. The Defensible Space and Home Ignition Zone concepts when applied to other improvements in the community can enhance their survivability as well. Figure 31 below lists the mitigation actions that will improve protection of life safety and enhance the survivability of structures in the community.

Home Hardening and Defensible Space actions are among the more achievable and direct impacts that property and homeowners have under their control, and are critical for the safety and well-being of our communities. Figure 31 provides an example checklist, and more details area in *Appendix A*.

Figure 31. *Structure Mitigation Action Checklist List {see Appendix A for a printable version}*

From the Winter 2021 Edition: Forestland Steward, University California Cooperative Extension		
Priority	**Location**	**Purpose**
1	Roof	Your roof is the most vulnerable part of your house to ember wash. Regularly inspect, maintain, and clean your roof. Make sure to block spaces between roof decking and covering to prevent embers from catching. Clean gutters and consider installing metal gutter guards. When it is time to upgrade, make sure your new roof meets Class A standards.
1	Vents	Vents allow for critical air circulation in a building; however, they can be penetrated by embers and ignite content within the home, especially through roof or under-eave vents. Upgrade existing 1/4-inch vent screens to 1/16-inch or 1/8- inch metal mesh or install the new flame and ember resistant vents. As a temporary strategy, prior to wildfire evacuation, cover vents with plywood or metal tape.
1	Vegetation	Start with the house and work outwards. Remove or relocate combustible plants and mulch within the first five feet of the home and attached decks or stairs. Providing this buffer around the home reduces the potential for ember ignition in this zone and protects the siding and windows from flame contact. Grouping plants into islands in Zone 1 (5-30 feet around the home) will reduce the potential for flames to burn directly to the home.
2	Decks	Remove debris that accumulates on or in between deck board gaps. Do not store combustible materials under the deck. Outdoor furniture, door mats, brooms, umbrellas, and plants should all be relocated in the event of an oncoming wildfire. Decks that overhang slopes are particularly vulnerable and increased defensible space is highly recommended. For new deck installation, when non-fire-retardant treated wood is used, increase the gap to 1/4-inch between deck boards and joist spacing. Apply foil-faced self-adhering flashing tape on the top of each joist.
3	Windows	Remove vegetation immediately outside of the windows. Where radiant heat exposures are possible, install or upgrade to multi-pane tempered glass windows. If the window is within 30 feet of a neighboring home or structure, consider installing noncombustible shutters to close upon evacuation or cover windows with temporary plywood.
4	Eaves	Inspect eaves for gaps around rafter roof tails and blocking. Make sure to plug or caulk gaps. If possible, replace open-eave designs with soffited-eaves and upgrade your vents.
5	Siding	In addition to a 5 foot noncombustible horizontal zone, maintain a 6-inch noncombustible vertical zone between the ground and the start of the siding. Inspect all siding and plug or caulk existing gaps and joints. If another house or structure is within 30 feet, consider replacing your siding with noncombustible or ignition-resistant materials. Gel coatings are not recommended because they are difficult to install and only provide a limited amount of protection time.

6.2.3 Sustain Natural and Cultural Resources

These assets should be managed with the same guidelines and tools as followed to protect other values. Pre-fire preventative measures at small and large property scales can reduce wildfire severity outcomes. Reducing wildfire impacts on natural and cultural resources is primarily

accomplished through fuel treatment implementation and, when structures are present, with standard "home" hardening and defensible space tactics. Solutions include collaborative actions by agencies and community members, proactively addressing fuels reduction on individual properties and adjacent wildland areas.

Westside Yreka
Courtesy of Point2 Realty

Many historical cultural and/or natural resources have been identified, mapped and registered with specific protection mitigation requirements. During a wildfire event, standard operation practices include employing protection measures in suppression strategy. The standard use of Recommended Best Management Practices (see Section 6.3.3) minimizes impacts to cultural and natural resources.

6.3 FUELS MITIGATION ACTIONS

A science-based strategy provides clear direction and rational for planned manipulation of vegetation/fuels to modify potential fire behavior and its effects. The primary objectives of fuels mitigation are to reduce wildfire intensity, fire spread, and severity of fire effects (NPS, 2004). Foremost in strategic fuels planning is to enable safe ingress and access along primary community roadways. Structure hardening, defensible space work, and emergency preparedness activities well before a wildfire event, are also imperative tactics in this strategy. Utilizing this strategy as a basis for treatment actions will greatly influence the safety and wellbeing of Yreka Area citizens and reduce potential community losses through increased efficiency and safety of firefighting resources.

Actions to address primary fuel treatments vary in design and specifications as determined by neighborhood conditions, fuel types, accessibility and adjacent properties.

6.3.1 Hazard Fuel Treatments

Fuel treatment guidelines give neighborhoods maximum flexibility to carry out current and future hazard reduction projects. Greater detail can be found in *Part II. Planning Areas*. These treatments should be planned and developed strategically utilizing fire science from assessment outcomes explained in *Section 5* of this plan.

Roadside Treatments (Fuel Breaks and Road Access)

Roadside fuel reduction is considered a priority treatment along with home hardening and defensible space. These treatment actions 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. Roadside or driveway fuel treatments width/height may vary depending on fuel type and terrain.

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

Throughout the Yreka Area, primary travel routes (arterial roads) are regularly maintained by local, county or state agency personnel and equipment. Roadway fuel reduction treatments (roadsides and medians) should be applied

to all public and private road systems.

Generally, these treatments are designed to remove fuels in a zone pattern of specified width, around or along an area of concern or a prominent feature. Examples may include but are not limited to ridge-top features, water sources and recreation areas. This strategy reduces highly ignitable fuels adjacent to a feature, which act as a wick or 'ladder' for rapid wildfire spread.

Fuel Treatment Units

Specified areas designated for hazard fuel reduction are referred to as Fuel Treatment Units (FTUs). These treatments may consist of non-developed land and/or private property with wildland or maintained vegetation. FTU location and size varies with vegetation type and treatment objectives. These units require careful planning and coordination with surrounding landowners and agency administrators. In many cases, a treatment area could be accomplished using multiple types of treatment alternatives; rarely is there a 'one-size-fits-all' option.

Fuel reduction activities are 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 treatment adjacent to the specified value will have a more intensive focused treatment prescription.

The fuel treatment information presented in Table 10 and Table 11 provide guidance to individual property owners and collaborative partners for implementation.

Fuel Treatment Maintenance

Recurring maintenance is a necessary step in any project ensuring continued viability of the initial wildfire hazard mitigation feature. 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.

There does not currently exist a database that records all of the work that has been done in the Yreka Area. Funding is being pursued to compile all of the work that agencies, including non-profits, have accomplished.

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. The City of Yreka Code 9.47.020 Public nuisances designated: "Any combustible refuse or waste or any material growing or placed upon a street, sidewalk or private property within the city which, by reason of its size, manner of growth, placement, or location, constitutes a fire hazard to a building, improvement, crop or other property or, when dry, will in reasonable probability constitute a fire hazard".

The County is considering a regulation to address vacant parcels and defensible space. For new projects, check with a CAL FIRE or a local fire department representative for updates.

6.3.2 Prioritization of Fuel Treatments

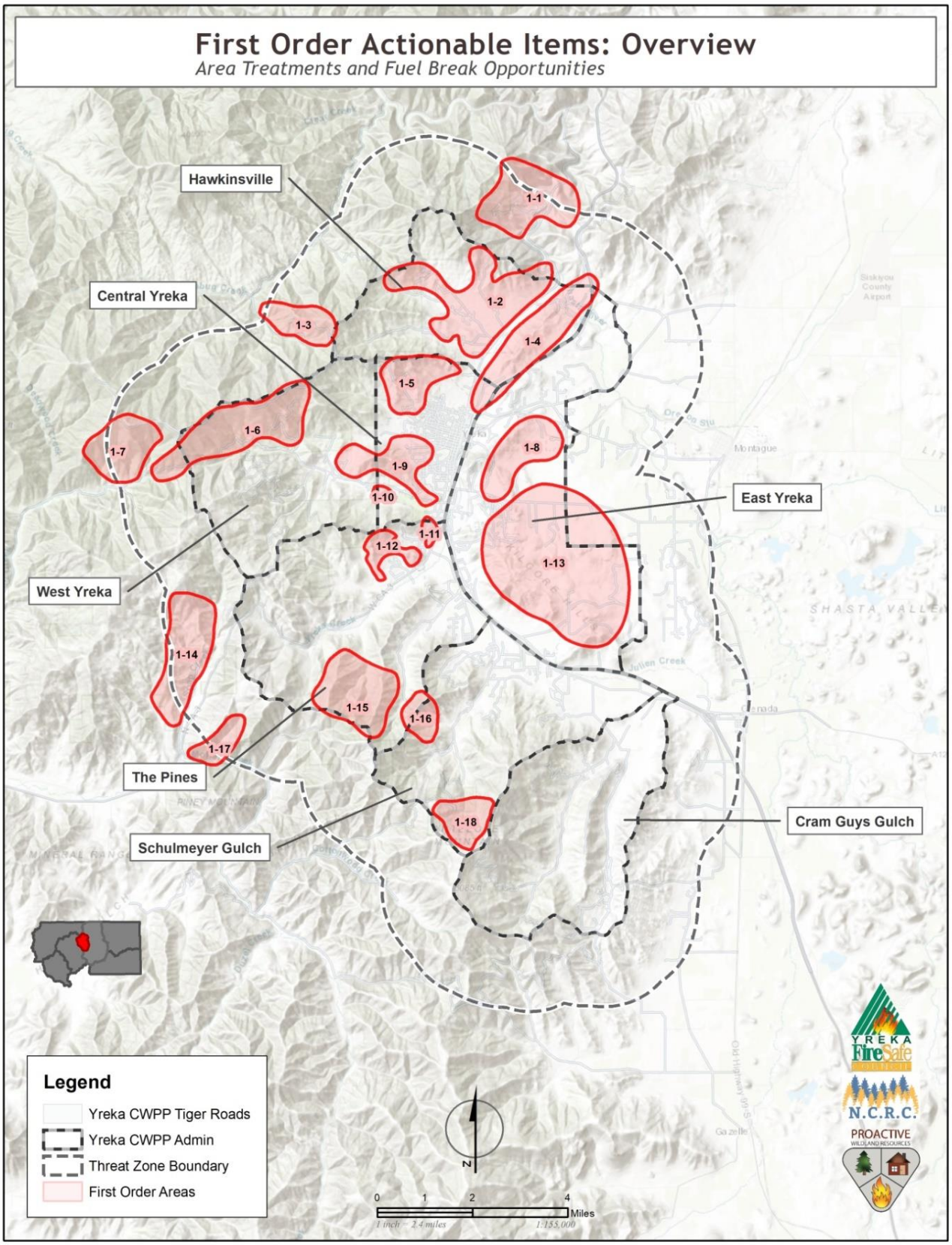
A fuel mitigation strategy also provides the foundation for a treatment prioritization process. Prioritizing community fuel reduction projects will guide citizens in decisions for both planning and implementation stages.

Prioritization should follow these basic premises:

1. Close proximity to dwellings or infrastructure. The fire modeling results (in Section Chapter 5) are factored into the prioritization process. 'Very-High' category hazard/threat areas and close proximity to residences receive a higher priority. Strategically located fuel treatments in extended WUI zones are also of high priority as these can reduce a wildfire advancing into neighborhoods.
2. Roadside fuel reduction treatments for all areas. Safe access is a necessity for life safety protection during community evacuation. It is imperative to plan and prioritize for long-term viability of existing treatments along key roads and high public use areas across the Yreka Area.
3. Close proximity to dwellings or infrastructure. The fire modeling results (in Section Chapter 5) are factored into the prioritization process. 'Very-High' category hazard/threat areas and close proximity to residences receive a higher priority. Strategically located fuel treatments in extended WUI zones are also of high priority as these can reduce a wildfire advancing into neighborhoods.
4. Fuel Treatments Units in WUI areas as funding and resources become available. For each PA, identified 'High Priority' Fuel Treatment Units (FTUs) are of greatest concern by Initial Attack (IA) firefighting units. Utilizing the Initial Attack Suppression Opportunity mapping analysis in *Section 5.4.*, areas displaying a higher quantity of "not likely to contain" and "cannot contain" acreage are assigned a higher priority for treatment. Greater detail for specific locations can be found in Part II: PAs.

Figure 32 shows the Yreka Area's high priority fuel treatment units for consideration in strategic planning. These areas were identified during the analysis process as being areas of concern throughout the entire fire season.

Figure 32. *First Order Actionable Items – Area Treatments and Fuel Break Opportunities*



6.3.3 Fuel Treatment Levels and Prescriptive Guidelines

Treatment prescriptive guidelines vary by intensity of fuel reduction. The intensity level is determined by the vegetation type, topography, and may be limited by sensitive habitats, historical and cultural sites, soil, watercourses, proximity to structures and roads. Treatment intensity is designated by the amount of vegetation reduction 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. 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.

The following tables summarize treatment prescription specifications for Roadside and Driveway Fuel Treatments (Table 10) and Fuel Treatment Units (Table 11). These are minimum guidelines. The more area treated creates more resilience in a wildfire environment.

Table 10. *Roadside and Driveway Fuel Treatment Prescriptive Guidelines**

Location → **Fuel Type ↓**	**Primary Zone (A)** (up to 50') *(distance varies with terrain and accessibility)*	**Secondary Zone (B)** (50' – 100') *(distance varies with terrain and accessibility)*
Grass/ Forbs	Reduce fuel depth to 4 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 communities.*		

Table 11. *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 (primarily correlated with tree and chaparral overstory)	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-foot to 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 in 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.*			

Implementation Restrictions for Fuel Treatment levels

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

There are several potential limitations and/or restrictions on Roadside and Fuel Treatment Units, including:

- A California Environmental Policy Act (CEQA) analysis may be required prior to implementation of site-specific projects. If the project is funded by a federal agency, then National Environmental Policy Act (NEPA) procedures may also be required.
- 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.
- Visually sensitive area considerations: 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 must 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, 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

- 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 actions are advised:
    - Streamside Management Zone (SMZ) courses must be identified and flagged prior to any type of 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 in identified sensitive areas. Operators must contain and 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 Treatments

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

Mechanical: This 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 lowers the vertical component of light flashy fuels, leaves debris in place, and thereby reduces exposure to wind allowing more moisture absorption from the soil. 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. Mastication rearranges and produces a less flammable configuration for hazardous fuels by rearranging vertically oriented fuels into horizontally oriented fuels through cutting and chipping of standing vegetation and allowing moisture absorption from the soil. 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, including smaller "skid steer" type equipment with variable type attachment heads

- **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 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 and diameter limit for trees removed. An adequate thinning treatment 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

WUI Property Thinning
Courtesy of J. Titus

- **Slash treatment** may include removal, chipping, mastication, or piling and burning. 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. 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.

Biological: 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 access, fencing requirements, transportation costs and transport of water from sources to the site.

Goats are the typical animal of choice for grazing within communities. Containment of these animals within a fuel treatment unit assures that they eat only the target vegetation. There are many other issues and considerations to become familiar with before utilizing this method of treatment.

Herbicide: This treatment type involves a broad or hand-applied chemical to kill live vegetation. A source for current information on this method is the Siskiyou County Agriculture Department Resource Protection website.

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

6.3.5 Existing Fuel Reduction Activities

The Yreka Area has completed numerous projects through a combination of roadside and treatment activities including enhanced structure protection projects (i.e., water storage structures, signage, and defensible space). These efforts need to be expanded to improve safety for fire apparatus access/egress and life safety of citizens and firefighters along all primary evacuation routes and key high use areas within all neighborhoods.

A list of Actionable Items can be found in *Appendix A.*

6.4 WILDFIRE EVACUATION ACTIONS

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's Evacuation Tips:

"PLEASE EVACUATE PROMPTLY WHEN REQUESTED!"

It is the responsibility of each and every Yreka Area citizen to become educated and adopt measures to build resiliency in their hometowns and neighborhoods. Knowledge, mitigation actions and pre-planning are key components to survival.

The "Ready, Set, Go" suite of preparedness tools 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 should 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).

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)*

The lead time required to conduct mass evacuations during a wildfire event can be very short and immediate. During extreme conditions (i.e., in Butte County's 2018 Camp Fire), evacuation routes were quickly overwhelmed forcing residents to abandon vehicles. Applied communitywide proactive tactics can reduce this mayhem. 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.

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.

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, California, Emergency Operations Plan, 2018).

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. OES's Countywide Hazard Mitigation Plan, includes evacuation planning, which encompasses roles and regulations of all the agencies that maintain responsibility in an emergency situation.

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
- 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.

Emergency Response Communication

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

Emergency 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 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 Emergency Communication details 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

See *PART II. Planning Areas* for specific evacuation route guidance

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. 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 informed about daily road construction or roadblocks: road projects often occur in summer months, and roadblocks or limited travel on primary travel/evacuation routes may be problematic.
- Learn and practice alternate evacuation routes: primary routes may not be viable if they are blocked due to congestion or unsafe due to wildfire spread.

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 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 and 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

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:

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 Community Wildfire Protection Plan is to help qualify for grants and other potential financial resources. Limited fiscal resources budgetary constraints may make it difficult to address every need and implement all projects identified in a local CWPP. Timeframes associated with grants and other funding sources do not necessarily align with those of high priority projects. The YAFSC and other grant requestors will have a helpful new tool in their toolbox to help in project prioritization; a list of identified Actionable Items. This GYA tool supports the CWPP goals and can fulfill grant objectives in a timely manner as opportunities arise.

7.1 POTENTIAL GRANT FUNDING SOURCES

There are numerous opportunities for federal, state, and local grants. Several specific grant sources are summarized below.

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 and 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 and 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.

Resource Advisory Committee

A Secure Rural Schools Resource Act Advisory Committee (RAC) provides recommendations to the Forest Service on the development and implementation of special projects on federal lands as most recently reauthorized under the Secure Rural Schools Act and Community Self-Determination Act in Public Law 115-141. Each RAC consists of 15 people representing varied interests and areas of expertise, who work collaboratively to improve working relationships among community members and national forest personnel.

Since its' creation, the RAC has helped fund numerous projects in Siskiyou County. Projects recommended by the RAC include trails reconstruction and maintenance projects, fish passage and waterway restoration, community wildfire fuels reduction efforts, conservation education programs, and noxious weed reduction efforts. All RAC projects must show a clear benefit to public lands. Many of the projects are located on National Forest lands in Siskiyou County, but a majority occurs on private lands.

Secure Rural Schools RACs were first established under the "Secure Rural School and Community Self-Determination Act of 2000 (Public Law 106-393).

California Climate Investments

Forest Health Grants

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

Information available at the CAL FIRE website.

Fire Prevention Grants

- Project activities may include:
  - 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 inches in diameter and 20 feet in height
  - Dead and dying trees must be 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
  - Dead or dying trees must be removed 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 the CAL FIRE website.

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 (OES) Grants

Check the California OES grants website periodically for updates to available grant information.

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.

SECTION 8. MONITORING

The implementation of an agreed-upon monitoring schedule for this CWPP is an important task in future years.

8.1 CWPP MONITORING

A CWPP's strength depends on collaboration, its relevance, and the ability to engage citizens in wildfire preparation and protection actions going forward. 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. A monitoring schedule will ensure that the plan meets necessary currency in policy, strategy and resources.

Citizens, agencies and all participants who contributed in the CWPP development 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 needed in a CWPP revision.

The YAFSC will provide a leadership role, accepting responsibility to initiate a periodic 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 fuel treatments 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.

Monitoring and evaluation of a fuel treatment establishes baseline data for decisions about maintenance treatment schedules and determining the need for modifying 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 Fuel Break (FB) project with Treatment Sites
- Prescription table and information on known treatments/sites
- 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; optionally mark the plot site with, e.g., 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 YAFSC 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 is an important element of the fuels strategy component of a CWPP. The stored information is part of the project record database, which is helpful for:

1) Validating fuel treatment management strategies
2) Historical perspective of fuel treatments
3) Various educational forums
4) Providing important validation data for ongoing and future grant application processes.

PART II. Planning Areas (1-10)

1. **Hawkinsville**
2. **East Yreka**
3. **Central Yreka**
4. **West Yreka**
5. **The Pines**
6. **Schulmeyer Gulch**
7. **Cram Gulch and Guys Gulch**
8. **City of Yreka (Incorporated Area)**
9. **South Yreka Fire Protective District (FPD)**
10. **Threat Zone**

Information provided in each Planning Area (PA) contains wildfire assessment products specific to each planning area. The information may be referenced and further refined for utilization in fire planning, project work, or for requesting grant funding.

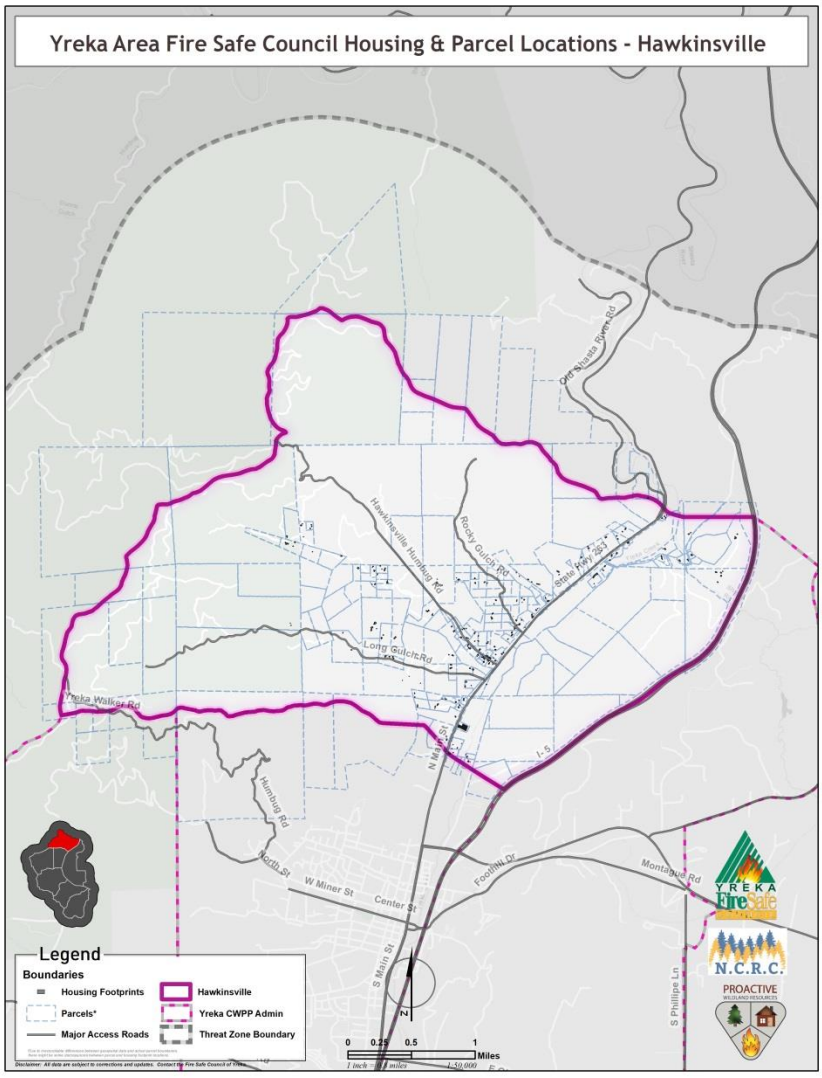
General Overview/Description

Hawkinsville is an unincorporated community that lies at the heart of this PA. It is located about two miles (3.2 km) north of Yreka and is 2,490 feet (759 m) above sea level. State Route 263 dissects the PA.

It is about 6,945 acres in size. The upper reaches are topographically defined by Badger Mountain to the north at 5,019 feet in elevation, falling to 2,403 feet above sea level (ASL) immediately below Badger Mountain at the confluence of Yreka Creek and Shasta River.

Three drainages dominate the area: Long Gulch running in a west to east orientation; Canal Gulch which runs east to west at its upper reaches and then in a northwest to southeast aspect; and Rocky Gulch, which runs in a northwest to southeast direction. Yreka Creek dominates the lowest aspects of the area.

Figure PA1.1. *Map of the Hawkinsville Planning Area*



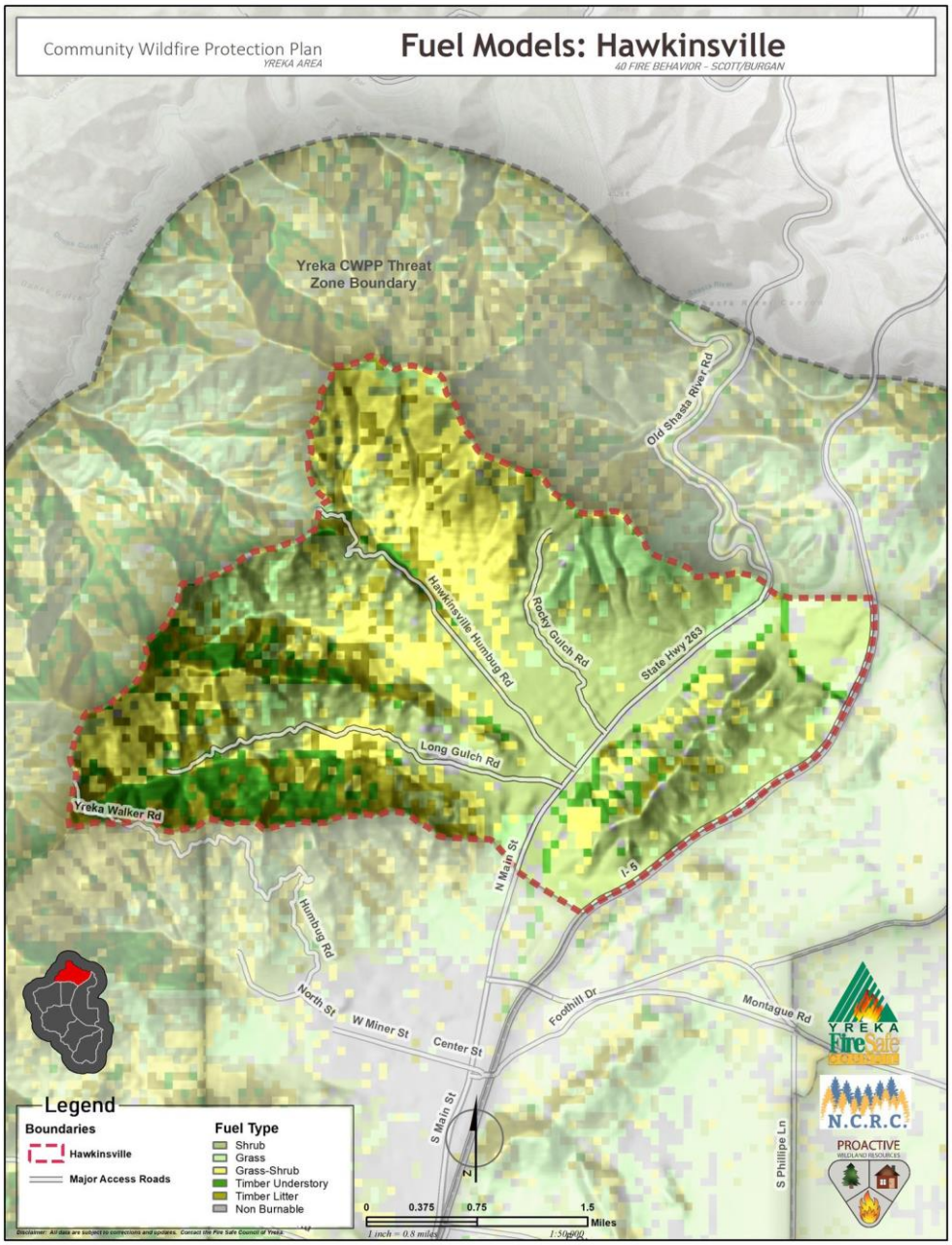
Wildland Fire Environment

The 2016 Grade Fire and subsequent 2020 Badger fire demonstrated the extreme volatility of the Hawkinsville PA. The Badger Fire burned 557 acres on Badger Mountain Road and Hawkinsville Humbug Road within sight of the city of Yreka, prompting evacuation orders and warnings. The fire was caused by a vehicle. On August 24, 2016, the Grade Fire ignited near Hawkinsville just two miles north of the city. It started due to an insufficient residential electrical connection during an extreme north wind event. It burned 710 acres and destroyed five structures.

The higher elevations are mixed conifer and oak woodlands. The remainder (approximately 75%) is covered by grass, shrub, or a grass/shrub mix (Figure PA1.2, Fuel Models). These fuel types are subject to very rapid spread rates during hot, dry summer months, making this PA especially vulnerable as the fire season progresses through summer and into fall. The upper reaches of Rocky Gulch and much of the surrounding ridges fall within the vicinity of high burn probabilities in a wildfire ignition (Figures PA1.3 and PA1.4, Burn Probability).

Wind-driven wildfires are the most significant weather concern and are further discussed in the Fire Behavior section below. Additional key risks of fire starts include the Highway 263 corridor, I-5 corridor, and lightning storms. The western half of the PA is also a very popular place to shoot firearms.

Figure PA1.2. *Fuel Models*



Acres / % Acres of Primary Fuel Types – Hawkinsville		
	Acres	**% Acres**
Grass	629	9.1%
Grass/Shrub	1,577	22.7%
Shrub	3,111	44.8%
Timber Litter	1,372	15%
Timber Understory	817	11.8%
Slash/Blowdown	0	0%
Non-modeled	207	3.0%
Total	**6,945**	**100%**

Analysis of Expected Fire Behavior

Wildfires respond to weather, fuels (vegetation), and topography. Wind - primarily due to downdrafts from lightning storms or strong prevailing winds - is the most critical weather factor influencing fire behavior. Fuels are typically lighter and fires can be more easily suppressed especially in the lower and mid-slope areas of this PA earlier in the fire season. As the fire season progresses, wildfires become more problematic as summer temperatures increase and fuel moistures decrease.

Figures PA1.3, PA1.4, PA1.5 and PA1.6 and their data tables are unique to this PA and were derived from flame length and rate of spread analyses and for two distinct (early and late) fire season situations (see *Section 5* for a methodology overview and definitions).

The outcomes were considered for two distinct but equally important fire characteristics:

1. Burn Probability

Figures PA1.3 and PA1.4 illustrate Burn Probability, providing an assessment of what areas and which types of fuels are likely to burn provided an ignition. The darker red a shaded area is, the more likely it is to burn. This is important information to determine where hazardous fuel mitigation may need to be focused.

One of the outputs from the Burn Probability modeling is the size of the modeled fires after two burning periods. This knowledge aids in understanding how fires want to burn and to what extent they might burn.

- **Early Fire Season (60th percentile weather)**
  The largest fire modeled during early fire season simulations was 26 acres. The average fire size was 10.5 acres.
- **Late Fire Season (97th percentile weather)**
  The largest fire modeled during late summer burned 16,225 acres. The largest area burned within the PA was 5,866 acres. Average acres for the simulation 4,615 and average acres within the PA 1,354 acres burned.

Wildfires burn across PA boundaries and simply expand in size and scope wherever burnable material exists. A fire that starts close to one PA boundary may predominantly burn into an adjoining area. When referring below to the "largest" fire burned, this is the total size across all PA boundaries. When "within" the PA, this is the total acres burned within the PA boundary.

2. Initial Attack Suppression Opportunity

Figures PA1.5 and PA1.6 display the outputs from the Initial Attack Suppression Opportunity modeling. This map combines predicted fireline intensity (flame length) and the rate of fire spread data, providing a more detailed and comprehensive view of potential safety concerns, problem fire hazard areas, and access issues. This tool can be useful to first responders to identify and address area-specific levels of suppression difficulty prior to an emergency. It can also be used by property owners to identify areas where actionable items

can be targeted for home hardening/defensible space work and/or targeted hazardous fuels reduction work.

Areas in green are where wildfires are likely to be contained, with areas in red indicating areas of increased suppression difficulty. Areas that present themselves as red early in the season will be of concern throughout the entire season. These areas are a focus for hazard fuels mitigation work as they increase wildfire risk for a longer period of time.

Areas in gray are where: 1) structures are present in a dense enough fashion that no burnable fuel model could be assigned, or 2) areas that will not burn, e.g., irrigated fields, pavement, etc. Recent fire events across California have shown that areas within the gray can still burn; the closer to the wildland urban interface, the more vigilance is recommended.

No fire department can be expected to prevent all structural losses in a Wildland Urban Interface (WUI) setting. The potential for a wildfire to outpace suppression efforts means that all property owners in WUI areas accept a high degree of risk as well as responsibility.

Figure PA1.3. *Burn Probability - Early Fire Season*

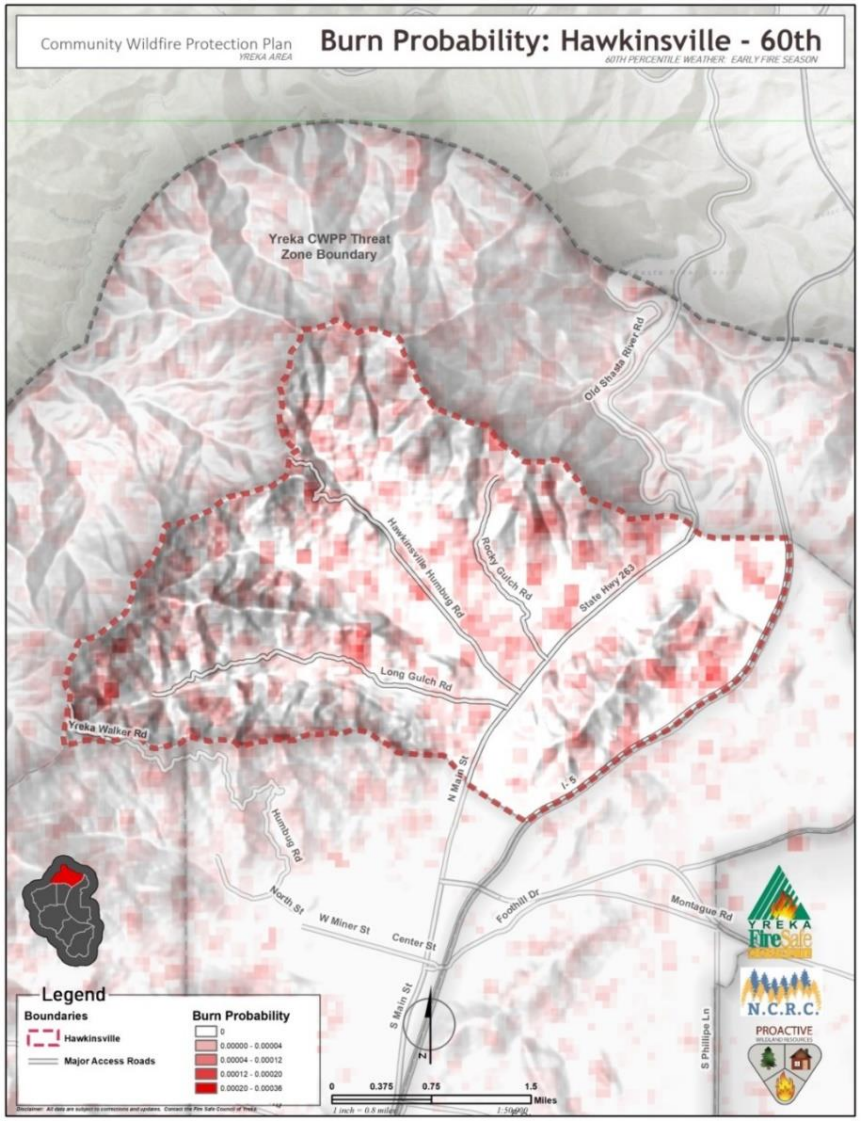
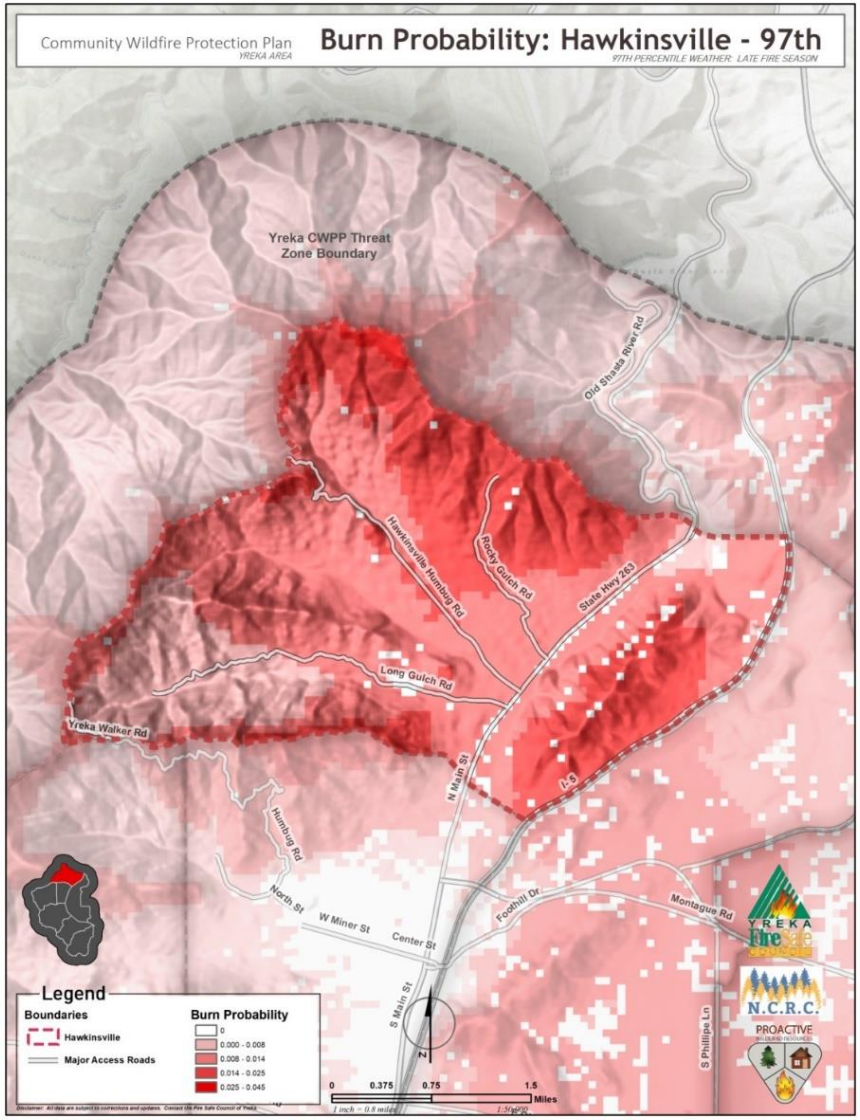


Figure PA1.4. *Burn Probability* **-** *Late Fire Season*



Number of Modeled Fires by Fire Size Class				Early Fire Season			Late Fire Season	
Size Class in Acres	**Class A: 0 to .25**	**Class B: .25 to 10**	**Class C: 10 t0 100**	**Class D: 100 to 300**	**Class E: 300 to 1K**	**Class F: 1K to 5K**	**Class G: 5K +plus**	**Total**
# of Fires / % Fires		378 / 58%	271 / 42%					649 / 100%
# of Fires / % Fires				2 / 0%	215 / 13%	805 / 50%	597 / 37%	1,621 / 100%

Figure PA1.5. *Suppression Opportunity - Early Fire Season*

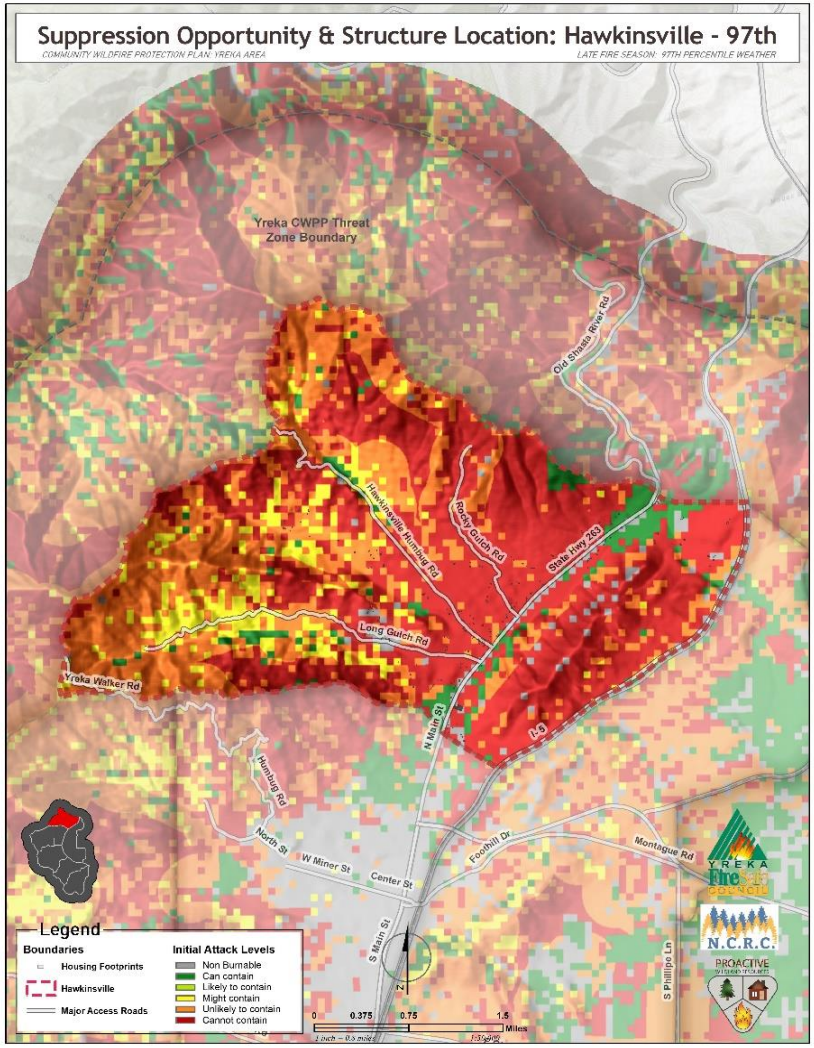
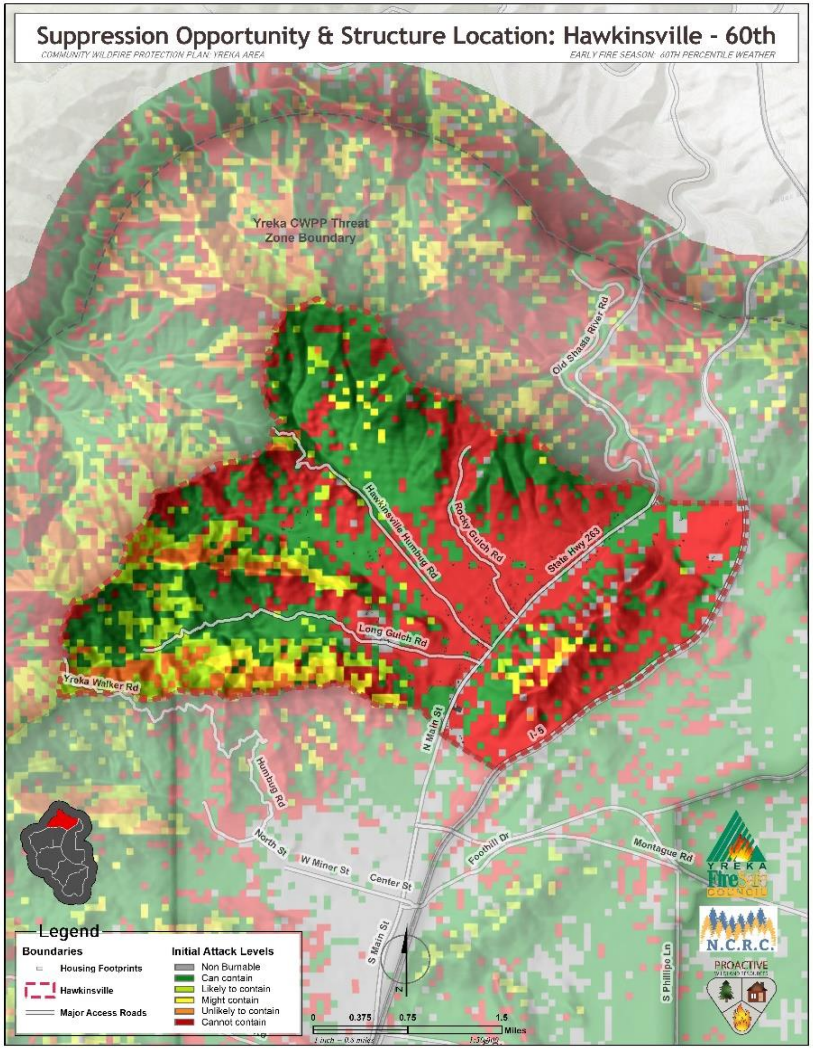


Figure PA1.6. *Suppression Opportunity - Late Fire Season*



Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season	
	Not Modeled	Can Contain	Likely to Contain	Might Contain	Not Likely to Contain	Cannot Contain	Total
# Acres / % Acres	207 / 3.0%	2,698 / 38.8%	569 / 8.2%	216 / 3.1%	351 / 5.1%	2,904 / 41.8%	6,945 / 100%
No. of Structures	37	67	0	0	0	197	301
# Acres / % Acres	207 / 3.0%	353 / 5.1%	0 / 0%	565 / 8.1%	2,282 / 32.9%	3,537 / 50.9%	6,945 / 100%
No. of Structures	37	14	0	3	49	198	301

Outcomes/Results

The above analyses provided outputs that were further used to conduct a proximity analysis of structures within 180 feet of IASO map areas with extremely high resistance to control. The results of this work are found in Figures PA1.7 and PA1.8. These tools are for utilization by property owners and local agencies in continued dialogue about where work should be focused, with a goal of potentially accelerating hazard fuel reduction activities within the PA. An annual review of the following items is recommended: 1) local initiatives for fuel treatment, 2) annual actions to protect residential homes and neighborhoods by creating defensible space, and 3) changes such as fires or other actions, that may have modified onsite fuels since the prior review.

1. Structures Potentially at Risk

Figure PA1.7 was developed by creating Zones of Concern that extend 300 feet beyond identified structures.

- Red Polygons: Areas within the red polygons are zones that are at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in modeled "Not-Likely-to-Contain" and "Cannot Contain" areas.
- Orange Polygons: These are areas identified that will become more at risk later in the summer and into the fall before the first rains.

Property owners should perform all of their structure hardening and defensible space work as identified in *Section 6* and *Appendix A*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.

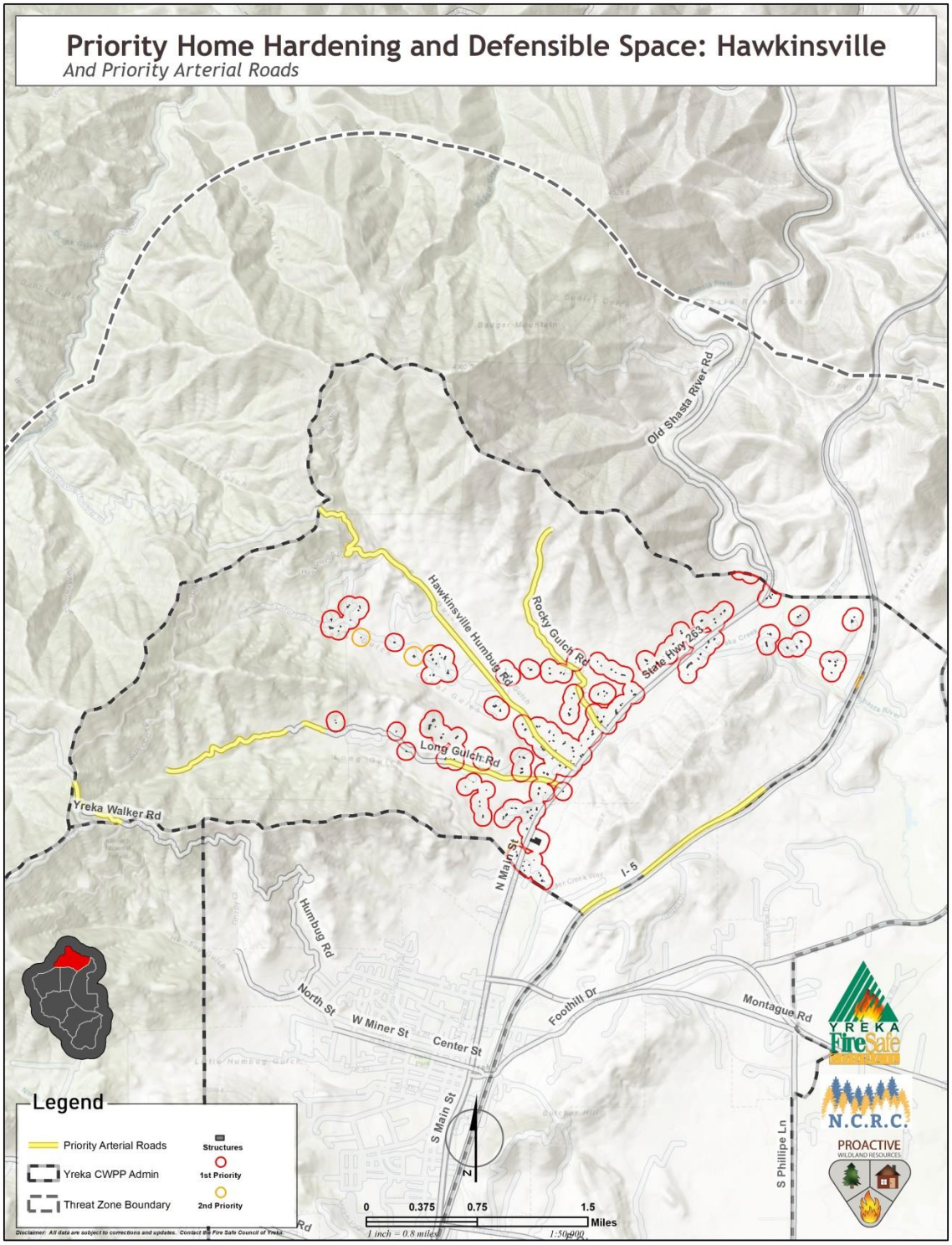
Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

2. Priority Areas/Roads for Hazardous Fuels Mitigation

Figure PA1.8 was developed by overlaying the Burn Probability analysis and Initial Attack Suppression Modeling outputs and suggests the following key priorities for treatments:

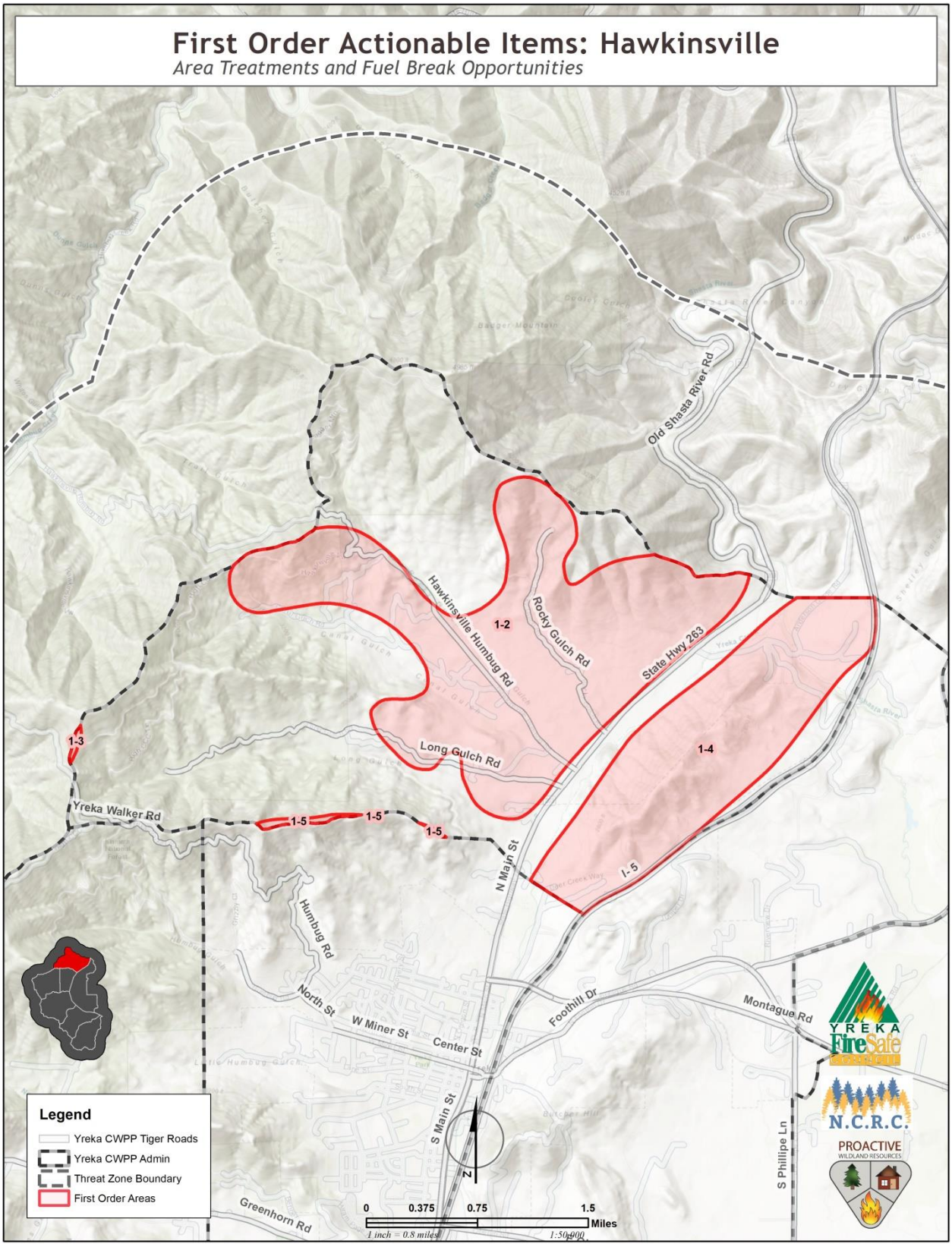
1. Roads/Infrastructure (areas detailed in Figure PA1.7)
2. Areas where Structures are highlighted by red polygons
3. Fuel Break along ridge between Hawkinsville/Humbug Rd and Long Gulch Rd.

Figure PA1.7. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Structures Potentially at Risk		
	Late Season Only	**Early and Late Season**
No. of Structures	2	234

Figure PA1.8. *Priority Areas for Hazardous Fuels Mitigation*



Wildfire Protection Resources

There are no local fire suppression resources within this PA. CAL FIRE has wildfire suppression responsibility for the area. The nearest CAL FIRE stations are in Yreka and Hornbrook. The Yreka, South Yreka, Montague, and Grenada Fire Departments would respond under mutual aid agreements.

This plan is not intended to modify the provisions of any other agreements which a participating entity may have entered or may enter in the future.

It is the goal of the Agencies to this Agreement to achieve common standards within each agencies' best interest, recognizing differing agency missions and mandates. Each agency to this plan recognizes that other agency standards are reasonable, prudent, and acceptable. This clause is not intended to affect the jurisdictional agency's land management standards.

Primary concerns and challenges faced by protection forces

#1 = Access-ingress/egress are among the highest priority safety elements in a wildfire emergency.

- ✓ 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

Contact information for local fire protection services

State Resources (CAL FIRE)

- **CAL FIRE Yreka Station**
  1809 Fairlane Rd, Yreka, CA 96097 | (530) 842-4359
- **CAL FIRE Hornbrook Station**
  14638 Bradley Henley Rd, Hornbrook, CA 96044 | (530) 475-3582

Local Community & Volunteer Resources

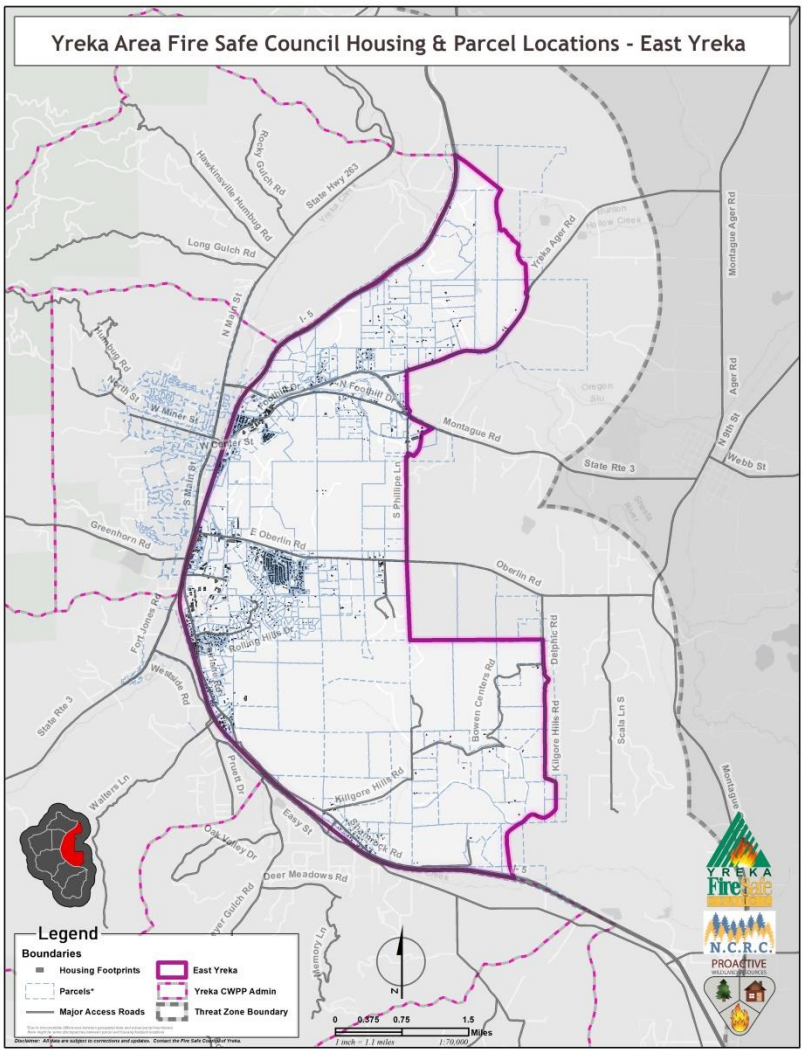
- **Yreka Fire Department**
  401 W. Miner St, Yreka, CA 96097 | (530) 841-2383
- **South Yreka Fire Protection District**
  3420 Easy St. Yreka, CA 96097 | (530) 842-1477

- **Montague Fire Department**
  121 South 10th St, Montague, CA 96064 | (530) 459-5343
- **Grenada Fire Protection District**
  6055 4th Ave, Grenada, CA | (530) 436-2200

General Overview/Description

The East Yreka PA lies to the east of I-5 and is about 11,615 acres in size. The PA is dissected by a range of hills: Butcher Hill in the north at an elevation of 3,248 feet above sea level and, to the south, Kilgore Hill which lies at 3,707 feet above sea level. The lowest point in the PA is approximately 2,645 feet above sea level where Yreka Creek flows under the freeway overpass.

Figure PA2.1. *Map of the East Yreka Planning Area*



Yreka Creek generally dominates the lowest aspects of the area to the east of I-5.

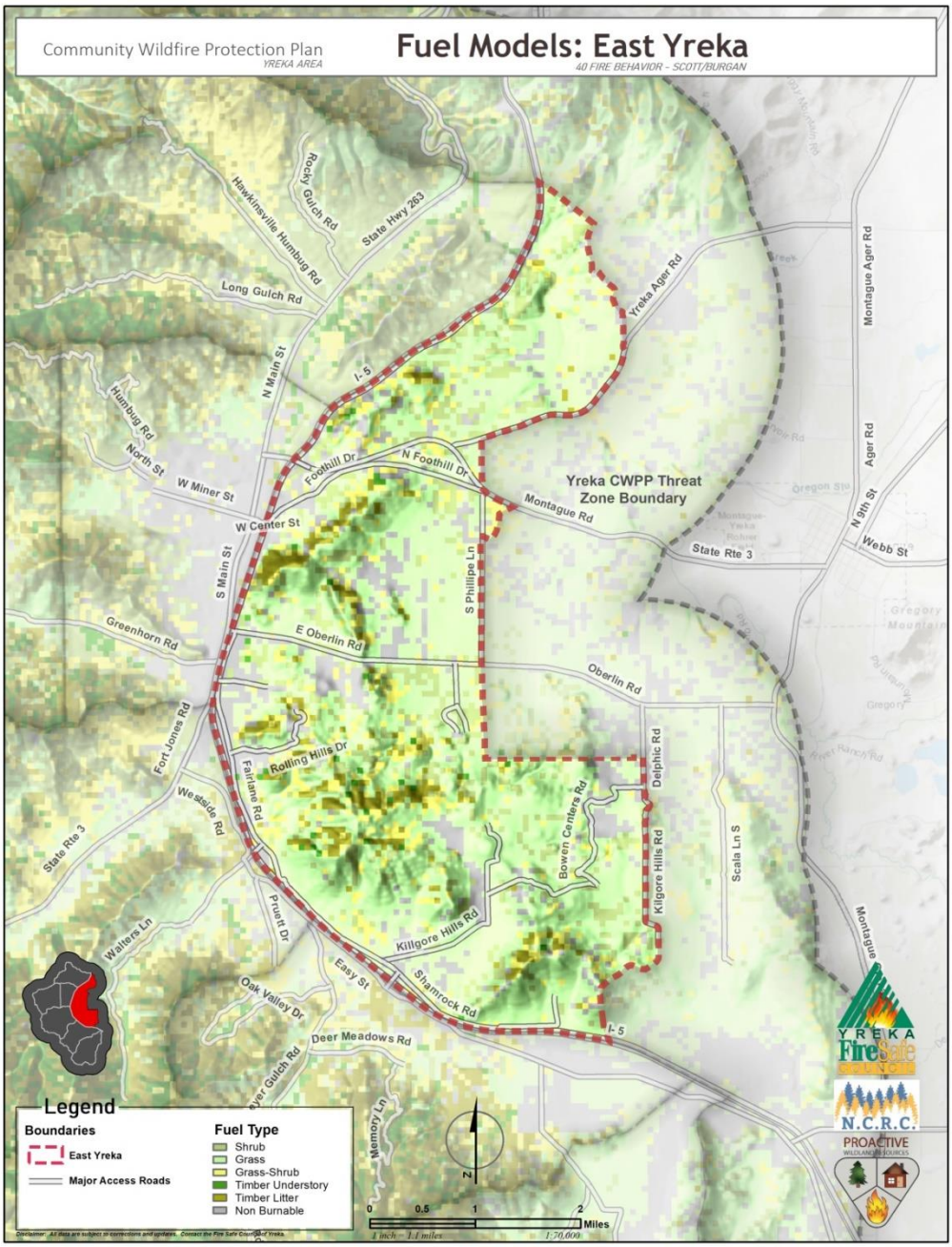
Wildland Fire Environment

80% of the PA is covered in grass, grass/shrub and/or shrub (Figure PA2.2, Fuel Models). These fuel types are subject to very rapid spread rates during hot, dry summer months, making this PA especially vulnerable as the fire season progresses through summer and into fall (Figures PA2.3 and PA2.4, Burn Probability). Much of the Kilgore Hills and the Butcher Hill area falls within the vicinity of high burn probabilities in a wildfire ignition. The proximity of these areas to zones of population deserves attention as the fire season progress.

Wind-driven wildfires are the most significant concern.

Key risks of fire starts include the I-5 corridor, transient occupation along the Yreka Greenway, and lightning storms.

Figure PA2.2. *Fuel Models*



Acres / % Acres of Primary Fuel Types – East Side Yreka		
	Acres	**% Acres**
Grass	6,752	58.1%
Grass/Shrub	1,020	8.8%
Shrub	1,554	13.4%
Timber Litter	511	4.4%
Timber Understory	68	0.6%
Slash/Blowdown		
Non-modeled	1,710	14.7%
Total	**11,615**	**100%**

Analysis of Expected Fire Behavior

Wildfires respond to weather and topography. Wind is the most critical weather factor influencing fire behavior. Wildfires can get large quickly primarily due to downdrafts from lightning storms or strong prevailing winds. Fuels are typically lighter and fires can be more easily suppressed especially in the lower and mid-slope areas of this PA earlier in the fire season. As the fire season progresses, wildfires become more problematic as summer temperatures increase and fuel moistures decrease.

Figures PA2.3, PA2.4, PA2.5 and PA2.6 and their data tables are unique to this PA and were derived from flame length and rate of spread analyses and for two distinct (early and late) fire season situations (see *Section 5* for a methodology overview and definitions).

The outcomes were considered for two distinct but equally important fire characteristics:

1. Burn Probability

Figures PA2.3 and PA2.4 illustrate Burn Probability, providing an assessment of what areas and which types of fuels are likely to burn provided an ignition. The darker red a shaded area is, the more likely it is to burn. This is important information to determine where hazardous fuel mitigation may need to be focused.

One of the outputs from the Burn Probability modeling is the size of the modeled fires after two burning periods. This knowledge aids in understanding how fires want to burn and to what extent they might burn. There were 2,203 late fire season fires modeled for this PA.

- **Early Fire Season (60th percentile weather)**
  The largest fire modeled during early fire season simulations was 20 acres. The average fire size was 8.3 acres.
- **Late Fire Season (97th percentile weather)**
  The largest fire modeled during late summer burned 16,225 acres. The largest area burned within the PA was 5,109 acres. Average acres for the simulation 5,309 and average acres within the PA 1,759 acres burned.

Wildfires burn across PA boundaries and simply expand in size and scope wherever burnable material exists. A fire that starts close to one boundary may have predominantly burned into an adjoining area. When referring below to the "largest" fire burned, this is the total size across all PA boundaries. When "within" the PA, this is the total acres burned within the PA boundary.

2. Initial Attack Suppression Opportunity

Figures PA2.5 and PA2.6 display the outputs from the Initial Attack Suppression Opportunity modeling. This map combines predicted fireline intensity (flame length) and the rate of fire spread data, providing a more detailed and comprehensive view of potential safety concerns, problem fire hazard areas, and access issues. This tool can be useful to first responders to

identify and address area-specific levels of suppression difficulty prior to an emergency. It can also be used by property owners to identify areas where actionable items can be targeted for home hardening/defensible space work and/or targeted hazardous fuels reduction work.

Areas in green are where wildfires are likely to be contained, with areas in red indicating areas of increased suppression difficulty. Areas that present themselves as red early in the season will be of concern throughout the entire season. These areas are a focus for hazard fuels mitigation work as they increase wildfire risk for a longer period of time.

Areas in gray are where: 1) structures are present in a dense enough fashion that no burnable fuel model could be assigned, or 2) areas that will not burn, e.g., irrigated fields, pavement, etc. Recent fire events across California have shown that areas within the gray can still burn; the closer to the wildland urban interface, the more vigilance is recommended.

No fire department can be expected to prevent all structural losses in a Wildland Urban Interface (WUI) setting. The potential for a wildfire to outpace suppression efforts means that all property owners in WUI areas accept a high degree of risk as well as responsibility.

Figure PA2.3. *Burn Probability - Early Fire Season*

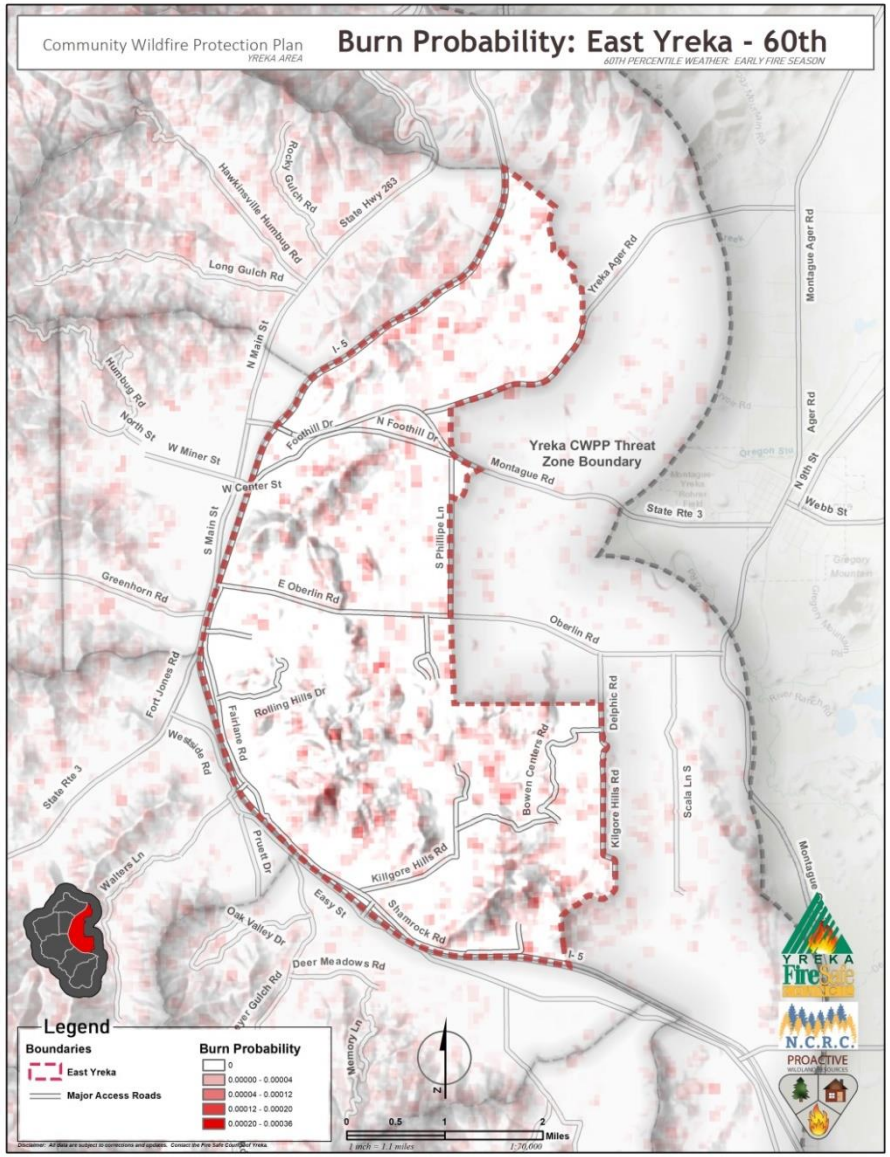
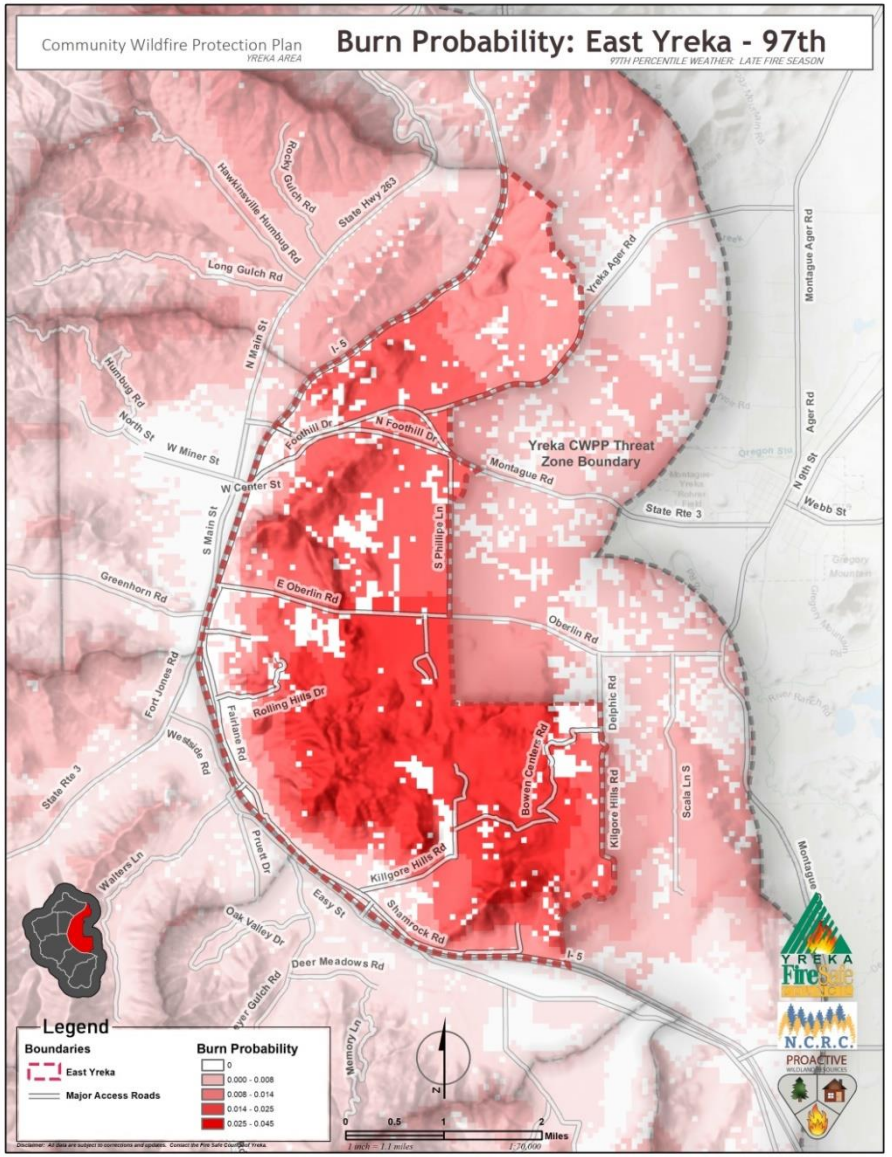


Figure PA2.4. *Burn Probability* **-** *Late Fire Season*



Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season		
Size Class in Acres	**Class A: 0 to .25**	**Class B: .25 to 10**	**Class C: 10 t0 100**	**Class D: 100 to 300**	**Class E: 300 to 1K**	**Class F: 1K to 5K**	**Class G: 5K +plus**	**Total**
# of Fires / % Fires		741 / 83%	155 / 17%					896 / 100%
# of Fires / % Fires		4 / 0.2%	5 / 0.2%	1 / 0%	13 / 0.6%	1,173 / 53.2%.	1,007 / 45.7%	2,203 / 100%

Figure PA2.5. *Suppression Opportunity - Early Fire Season*

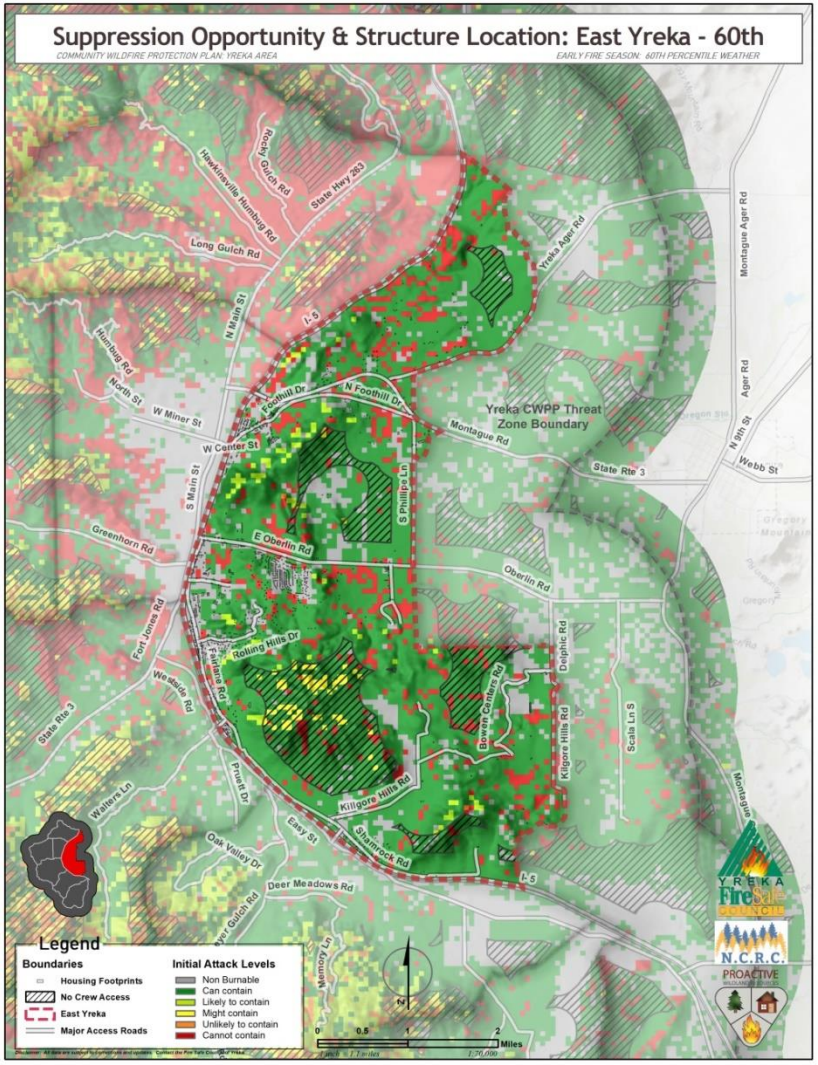
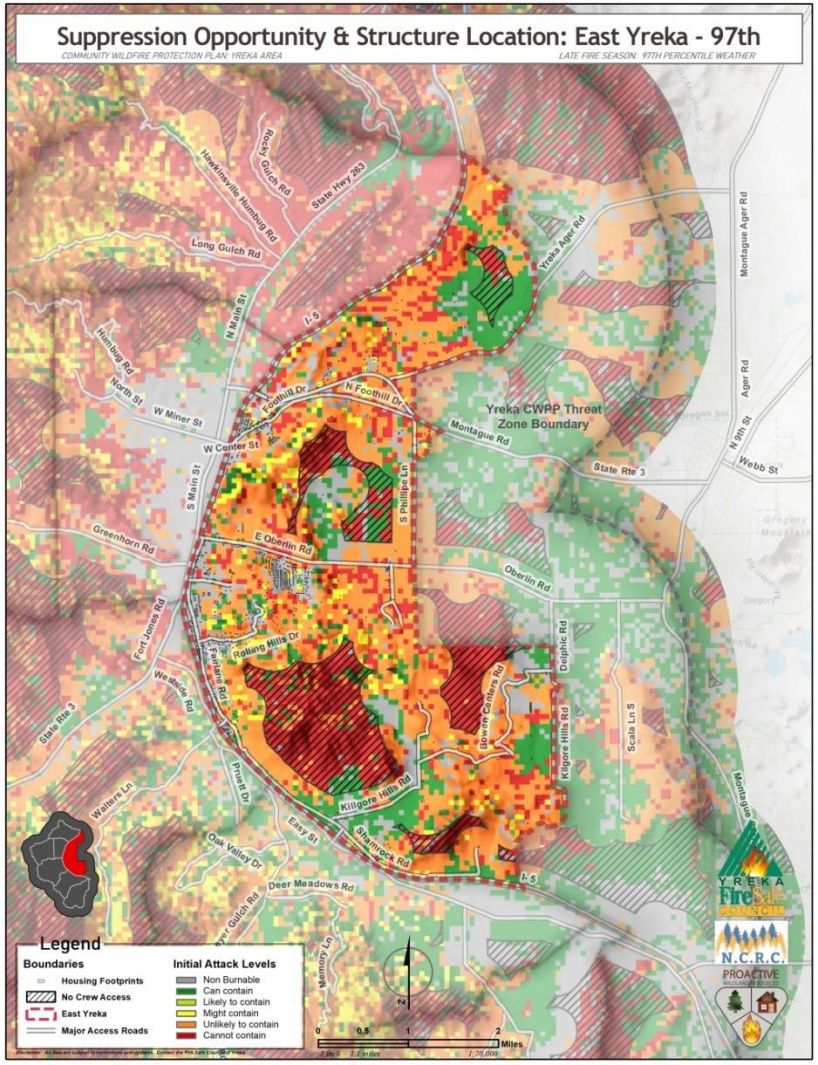


Figure PA2.6. *Suppression Opportunity - Late Fire Season*



Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season	
	Not Modeled	Can Contain	Likely to Contain	Might Contain	Not Likely to Contain	Cannot Contain	Total
# Acres / % Acres	1,710 / 14.7%	8,296 / 71.4%	162 / 1.4%	126 / 1.1%	8 / 0.1%	1,313 / 11.3%	11,615 / 100%
No. of Structures	771	708	4	0	0	108	1,591
# Acres / % Acres	1,701 / 14.7%	1,929 / 16.6%	0 / 0%	481 / 4.1%	4,868 / 41.9%	2,626 / 22.6%	11,615 / 100%
No. of Structures	771	123	0	85	504	108	301

Outcomes/Results

The above analyses provided outputs that were further used to conduct a proximity analysis of structures within 180 feet of IASO map areas with extremely high resistance to control. The results of this work are found in Figures PA 2.7 and 2.8. These tools are for utilization by property owners and local agencies in continued dialogue about where work should be focused, with a goal of potentially accelerating hazard fuel reduction activities within the PA. An annual review of the following items is recommended: 1) local initiatives for fuel treatment, 2) annual actions to protect residential homes and neighborhoods by creating defensible space, and 3) changes such as fires or other actions that may have modified onsite fuels since the prior review.

1. Structures Potentially at Risk

Figure PA2.7 was developed by creating Zones of Concern that extend 300 feet beyond identified structures.

- Red Polygons: Areas within the red polygons are zones that are at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in modeled "Not-Likely-to-Contain" and "Cannot Contain" areas.
- Orange Polygons: These are areas identified that will become more at risk later in the summer and into the fall before the first rains.

Property owners should perform all of their structure hardening and defensible space work as identified in *Section 6* and *Appendix A*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.

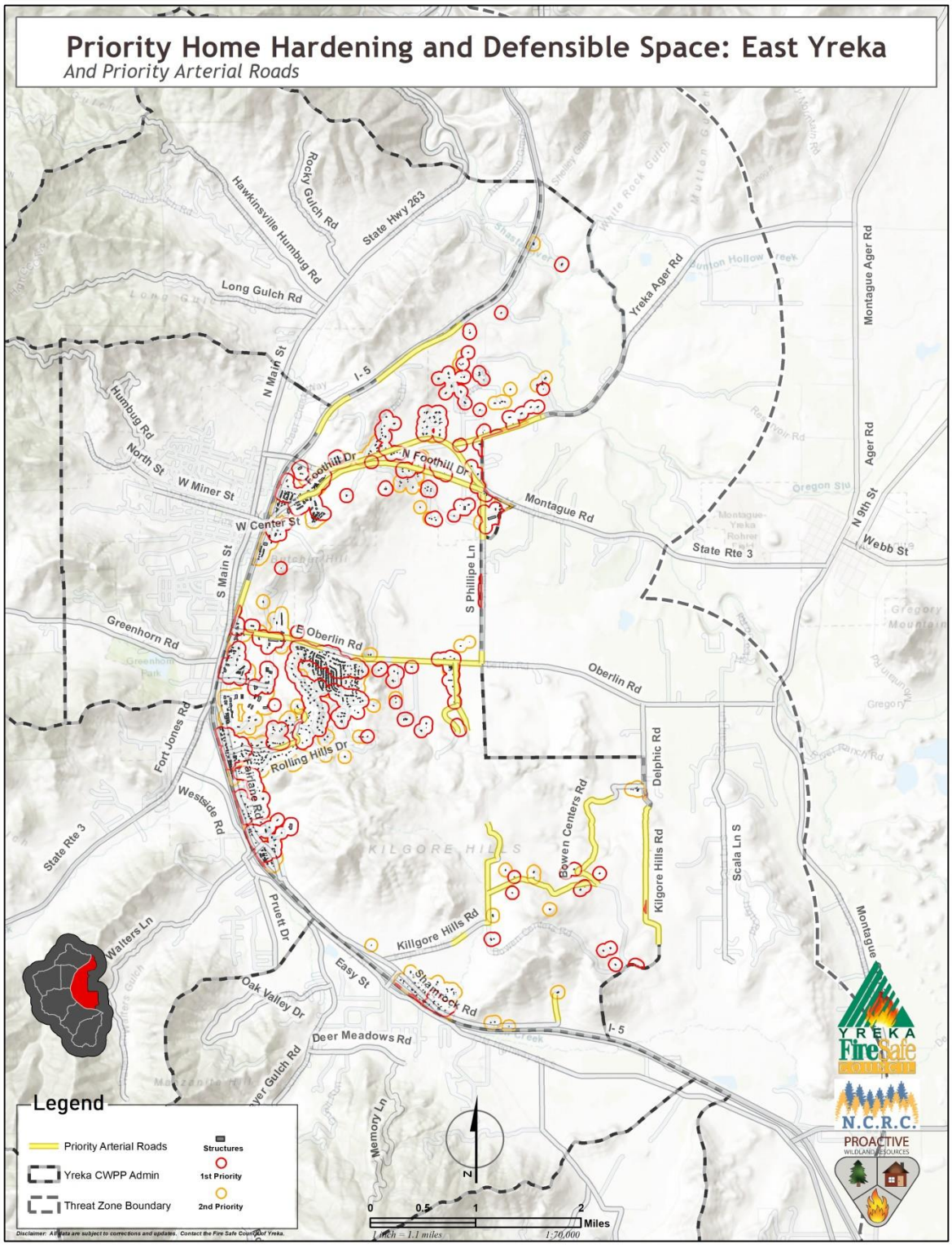
Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

2. Priority Areas/Roads for Hazardous Fuels Mitigation

Figure PA2.8 was developed by overlaying the Burn Probability analysis and Initial Attack Suppression Modeling outputs and suggests the following key priorities for treatments:

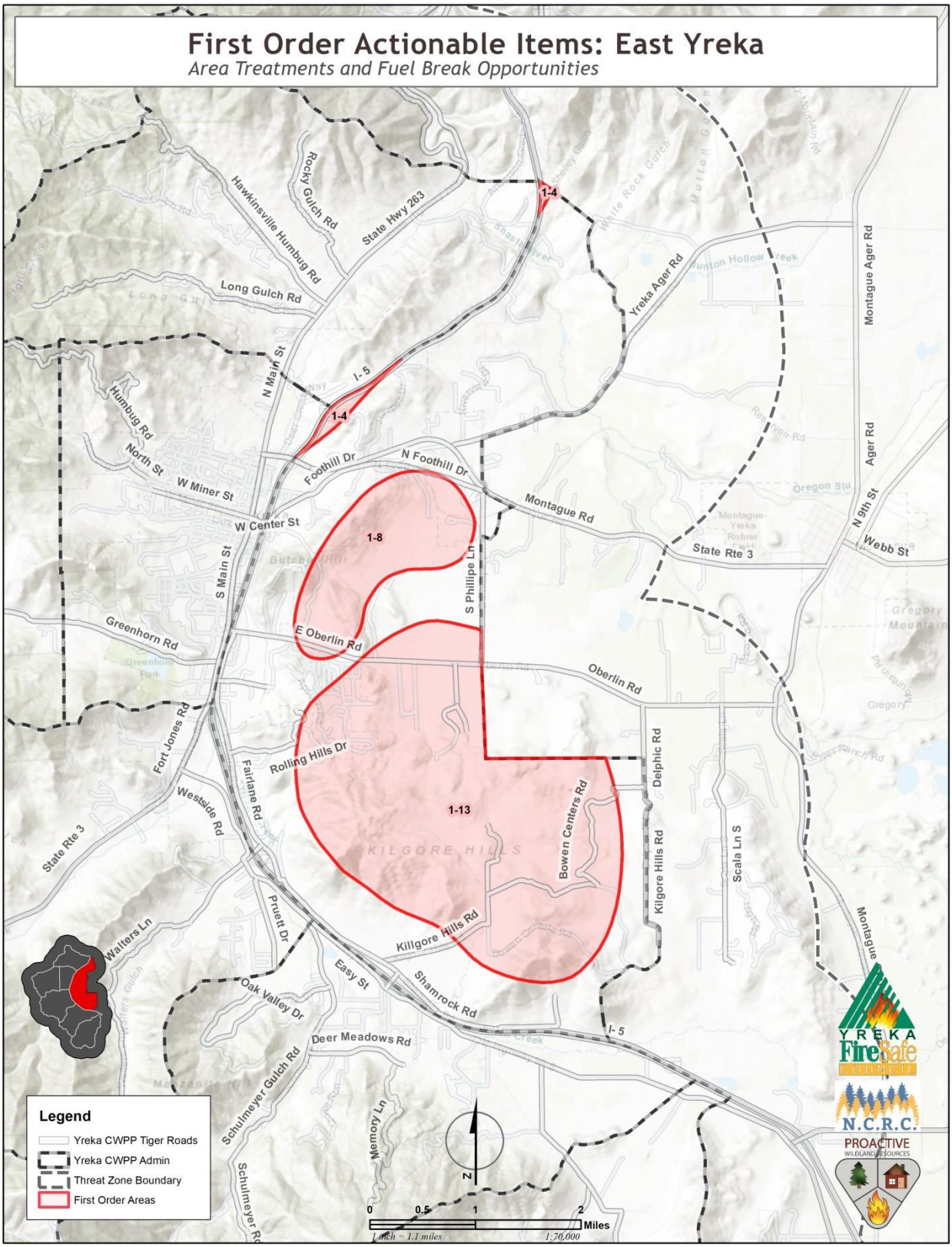
1. Roads/Infrastructure (areas detailed in Figure PA2.7)
2. Areas where Structures are highlighted by red polygons
3. Butcher Hill Communications Site
4. Kilgore Hills area

Figure PA2.7. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Structures Potentially at Risk		
	Late Season Only	**Early and Late Season**
No. of Structures	425	865

Figure PA2.8. *Priority Areas for Hazardous Fuels Mitigation*



Wildfire Protection Resources

Much of the western side of this PA is within the City of Yreka jurisdiction. This area is under the direct responsibility of the Yreka Fire Department. The rest of the area has CAL FIRE as its main wildland fire agency. The Yreka Fire Department's station is in downtown Yreka. The nearest CAL FIRE stations are in Yreka and Hornbrook. The South Yreka, Montague, and Grenada Fire Departments would respond under mutual aid agreements.

This plan is not intended to modify the provisions of any other agreements which a participating entity may have entered or may enter in the future.

It is the goal of the Agencies to this Agreement to achieve common standards within each agencies' best interest, recognizing differing agency missions and mandates. Each agency to this plan recognizes that other agency standards are reasonable, prudent, and acceptable. This clause is not intended to affect the jurisdictional agency's land management standards.

Primary concerns and challenges faced by protection forces

#1 = Access-ingress/egress are among the highest priority safety elements in a wildfire emergency.

- ✓ 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

Contact information for local fire protection services

State Resources (CAL FIRE)

- **CAL FIRE Yreka Station**
  1809 Fairlane Rd, Yreka, CA 96097 | (530) 842-4359
- **CAL FIRE Hornbrook Station**
  14638 Bradley Henley Rd, Hornbrook, CA 96044 | (530) 475-3582

Local Community & Volunteer Resources

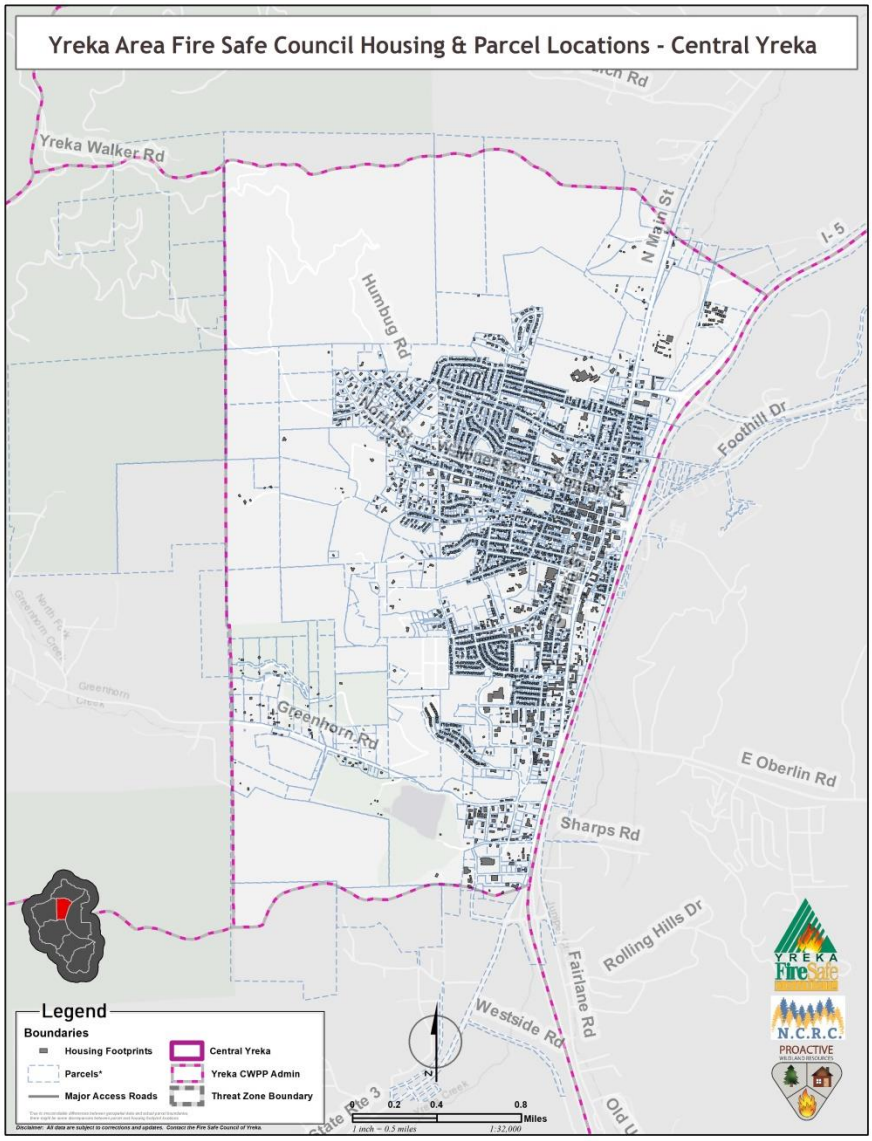
- **Yreka Fire Department**
  401 W. Miner St, Yreka, CA 96097 | (530) 841-2383
- **South Yreka Fire Protection District**
  3420 Easy St. Yreka, CA 96097 | (530) 842-1477

- **Montague Fire Department**
  121 South 10th St, Montague, CA 96064 | (530) 459-5343
- **Grenada Fire Protection District**
  6055 4th Ave, Grenada, CA | (530) 436-2200

General Overview/Description

The Central Yreka PA lies to the east of I-5. It is about 4,232 acres in size. Its boundaries were previously designed during the 2013 CWPP and left intact. Most of the Yreka Area's homes, businesses and related structures can be found in this PA. For an assessment of the entire incorporated city, see *Planning Area 8. Yreka City Administrative Boundary*.

Figure PA3.1. *Map of the Central Yreka Planning Area*



The PA is bounded by Hawkinsville to the north, West Yreka to the west and the Pines to the south. The ridge that divides Long Gulch and Humbug Gulch is the dominant topographic feature. The highest elevation in the PA is the northwest corner at about 4,200 feet. The lowest point is the junction of where the ridge comes down to Yreka Creek. 2,540 feet. The other prominent topographic feature is the southern boundary which is the ridge that runs above Greenhorn Park and divides Greenhorn from Lime Gulch.

Yreka Creek dominates the lowest aspects of the area where it is to the west of the freeway.

Wildland Fire Environment

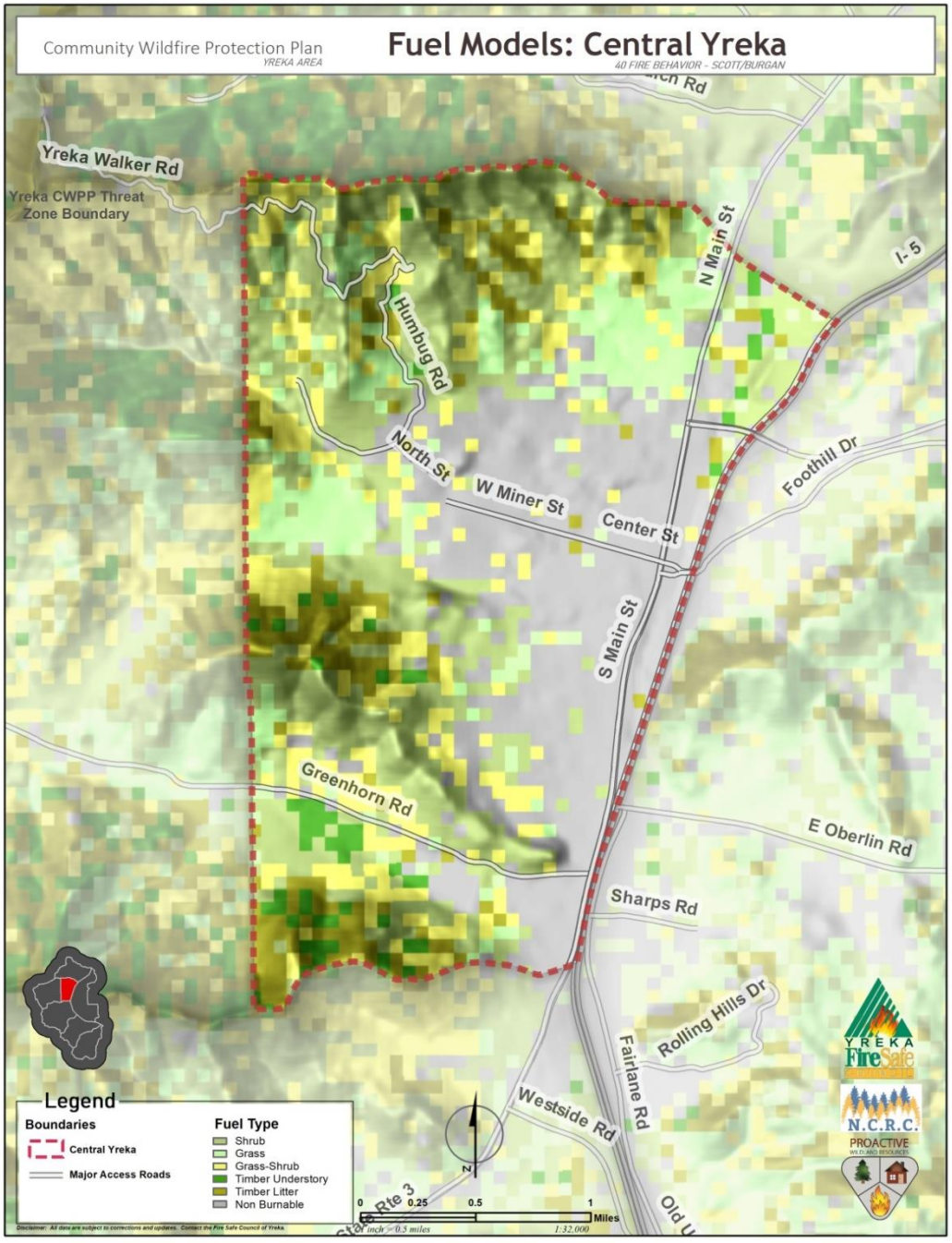
Yreka has had several fires in the past that have threatened the city but have, as of yet, not impinged on city residents or businesses. The 64,000 plus acre Haystack burn in 1955 is the last large fire event that threatened the City. The 2016 Grade Fire and subsequent 2020 Badger Fire demonstrated the extreme volatility of the area and are reminders that fire continues to be a threat to the city. The Badger Fire burned 557 acres on Badger Mountain Road and Hawkinsville Humbug Road within sight of Yreka, prompting evacuation orders and warnings. The fire was caused by a vehicle. On August 24, 2016, the Grade Fire ignited near Hawkinsville just two miles north of town. It started due to an insufficient residential electrical connection during an extreme north wind event. It burned 710 acres and destroyed five structures.

Approximately 60% of this PA is grass, grass/shrub, and/or shrub (Figure PA3.2, Fuel Models). These fuel types are subject to very rapid spread rates during hot, dry summer months, making this PA especially vulnerable as the fire season progresses through summer and into fall (Figures PA3.3 and PA3.4, Burn Probability). The ridged bounding the north with the Hawkinsville PA and the ridge to the south bounding with the Pines PA fall within the vicinity of high burn probabilities in a wildfire ignition (See Figures 2 and 3 and trailing Burn Probability discussion.). The proximity of these areas to zones of population deserves attention, as the fire season progress.

Wind-driven wildfires are the most significant weather concern and are further discussed in the Fire Behavior section below.

Key risks of fire start concerns include the mobile transient population, errant careless acts such as cigarettes being discarded, debris burns being lighted during adverse weather conditions, etc. As fire seasons get longer and drier, the more susceptible the City is to fire starts.

Figure PA3.1. *Fuel Models*



Acres / % Acres of Primary Fuel Types - Central Yreka		
	Acres	**% Acres**
Grass	489	11.6%
Grass/Shrub	630	14.9%
Shrub	1,321	31.0%
Timber Litter	356	8.4%
Timber Understory	125	2.9%
Slash/Blowdown		
Non-modeled	1,312	31.0%
Total	**4,232**	**100%**

Analysis of Expected Fire Behavior

Wildfires respond to weather, fuels (vegetation), and topography. Wind - primarily due to downdrafts from lightning storms or strong prevailing winds - is the most critical weather factor influencing fire behavior. Fuels are typically lighter and fires can be more easily suppressed especially in the lower and mid-slope areas of this PA earlier in the fire season. As the fire season progresses, wildfires become more problematic as summer temperatures increase and fuel moistures decrease.

Figures PA3.3, PA3.4, PA3.5 and PA3.6 and their data tables are unique to this PA and were derived from flame length and rate of spread analyses and for two distinct (early and late) fire season situations (see *Section 5* for a methodology overview and definitions).

The outcomes were considered for two distinct but equally important fire characteristics:

1. Burn Probability

Figures PA3.3 and PA3.4 illustrate Burn Probability, providing an assessment of what areas and which types of fuels are likely to burn provided an ignition. The darker red a shaded area is, the more likely it is to burn. This is important information to determine where hazardous fuel mitigation may need to be focused.

One of the outputs from the Burn Probability modeling is the size of the modeled fires after two burning periods. This knowledge aids in understanding how fires want to burn and to what extent they might burn. There were 1,287 late fire season fires modeled for this PA.

- **Early Fire Season (60th percentile weather)**
  Largest fire modeled during early summer simulations was 20 acres. Average fire size was 9.5 acres.

- **Late Fire Season (97th percentile weather)**
  Largest fire modeled burned 16,225 acres. The largest area burned within the PA was 2,945 acres. Average acres for the simulation 4,912 and average acres within the PA 753 acres burned.

Wildfires burn across PA boundaries and simply expand in size and scope wherever burnable material exists. A fire that starts close to one PA boundary may predominantly burn into an adjoining area. When referring below to the "largest" fire burned, this is the total size across all PA boundaries. When "within" the PA, this is the total acres burned within the PA boundary.

2. Initial Attack Suppression Opportunity

Figures PA3.5 and PA3.6 display the outputs from the Initial Attack Suppression Opportunity modeling. This map combines predicted fireline intensity (flame length) and the rate of fire spread data, providing a more detailed and comprehensive view of potential safety concerns, problem fire hazard areas, and access issues. This tool can be useful to first responders to identify and address area-specific levels of suppression difficulty prior to an emergency. It can

also be used by property owners to identify areas where actionable items can be targeted for home hardening/defensible space work and/or targeted hazardous fuels reduction work.

Areas in green are where wildfires are likely to be contained, with areas in red indicating areas of increased suppression difficulty. Areas that present themselves as red early in the season will be of concern throughout the entire season. These areas are a focus for hazard fuels mitigation work as they increase wildfire risk for a longer period of time.

Areas in gray are where: 1) structures are present in a dense enough fashion that no burnable fuel model could be assigned, or 2) areas that will not burn, e.g., irrigated fields, pavement, etc. *Recent fire events across California have shown that areas within the gray can still burn*; the closer to the wildland urban interface, the more vigilance is recommended.

No fire department can be expected to prevent all structural losses in a Wildland Urban Interface (WUI) setting. The potential for a wildfire to outpace suppression efforts means that all property owners in WUI areas accept a high degree of risk as well as responsibility.

Figure PA3.3. *Burn Probability - Early Fire Season*

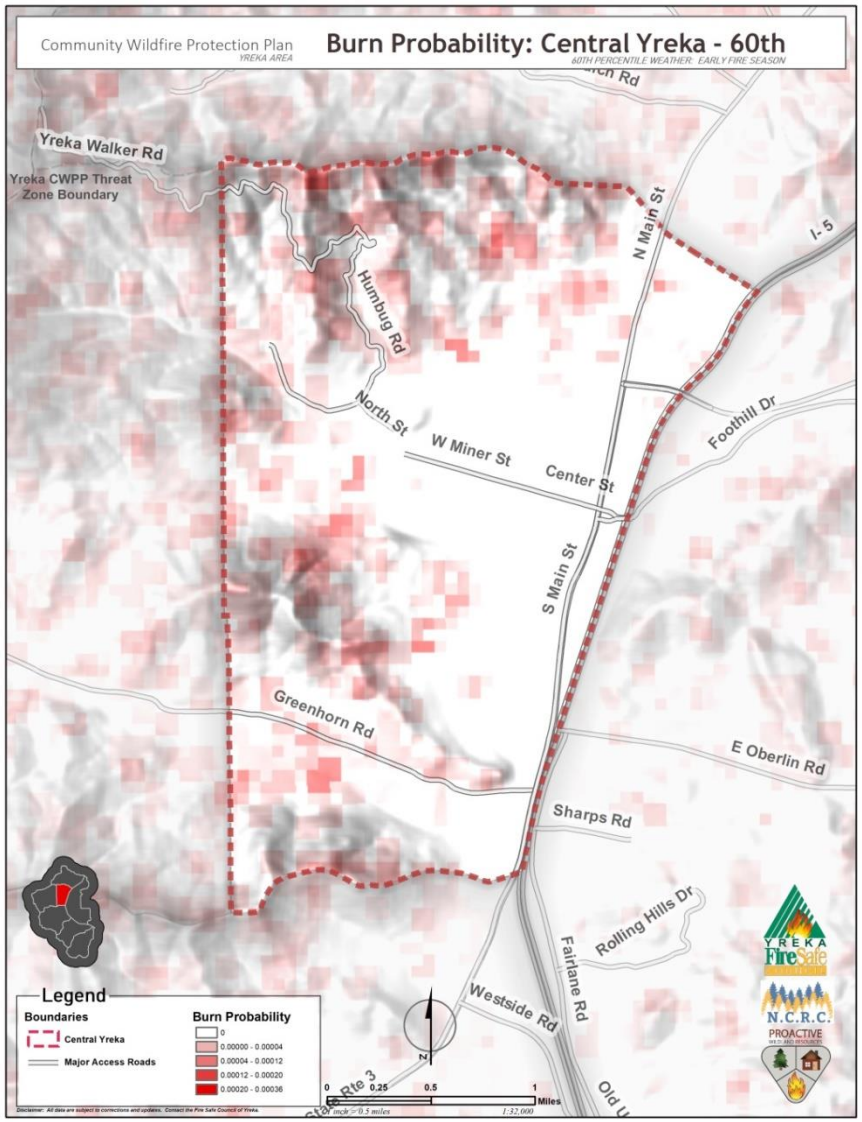
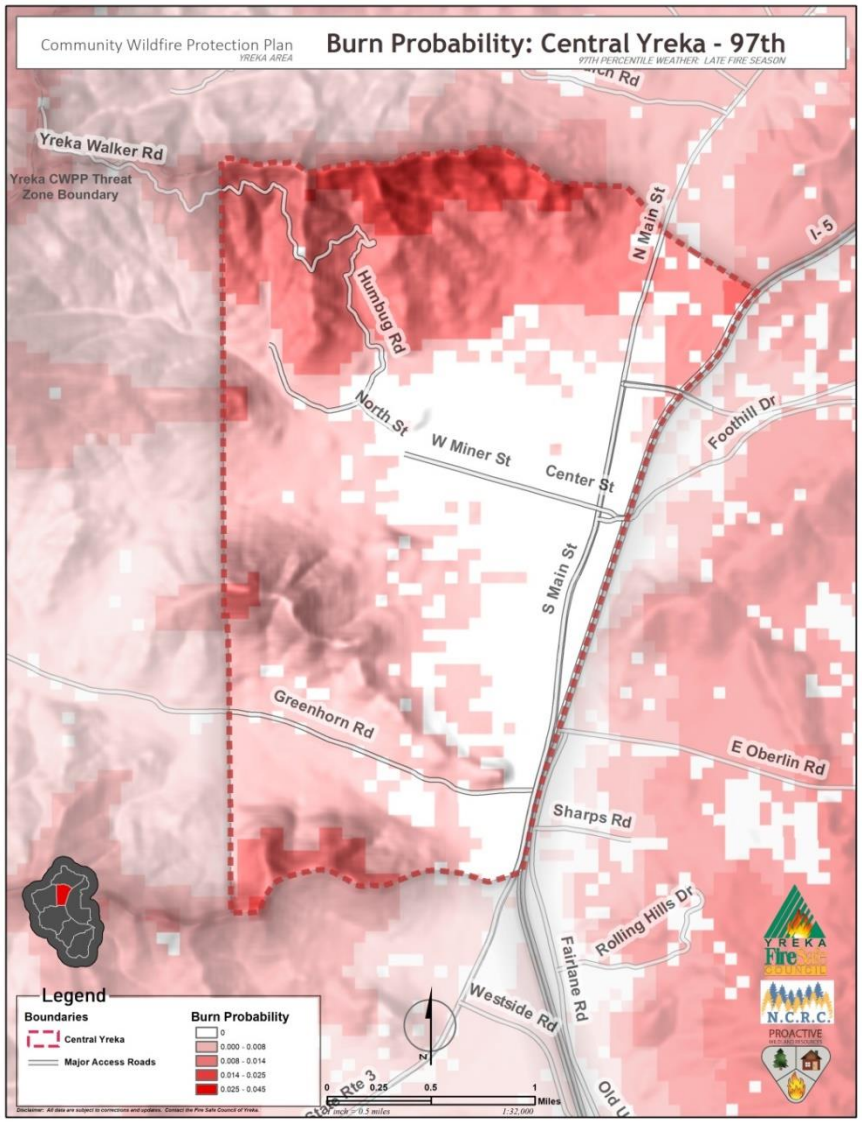


Figure PA3.4. *Burn Probability* **-** *Late Fire Season)*



Number of Modeled Fires by Fire Size Class				Early Fire Season			Late Fire Season	
Size Class in Acres	**Class A: 0 to .25**	**Class B: .25 to 10**	**Class C: 10 t0 100**	**Class D: 100 to 300**	**Class E: 300 to 1K**	**Class F: 1K to 5K**	**Class G: 5K +plus**	**Total**
# of Fires / % Fires		189 / 65%	103 / 35%					292 / 100%
# of Fires / % Fires		5 / 0.4%	4 / 0.3%	0 / 0%	58 / 4.5%	767 / 59.9%	447 / 34.9%	1,281 / 100%

Figure PA3.5. *Suppression Opportunity - Early Fire Season*

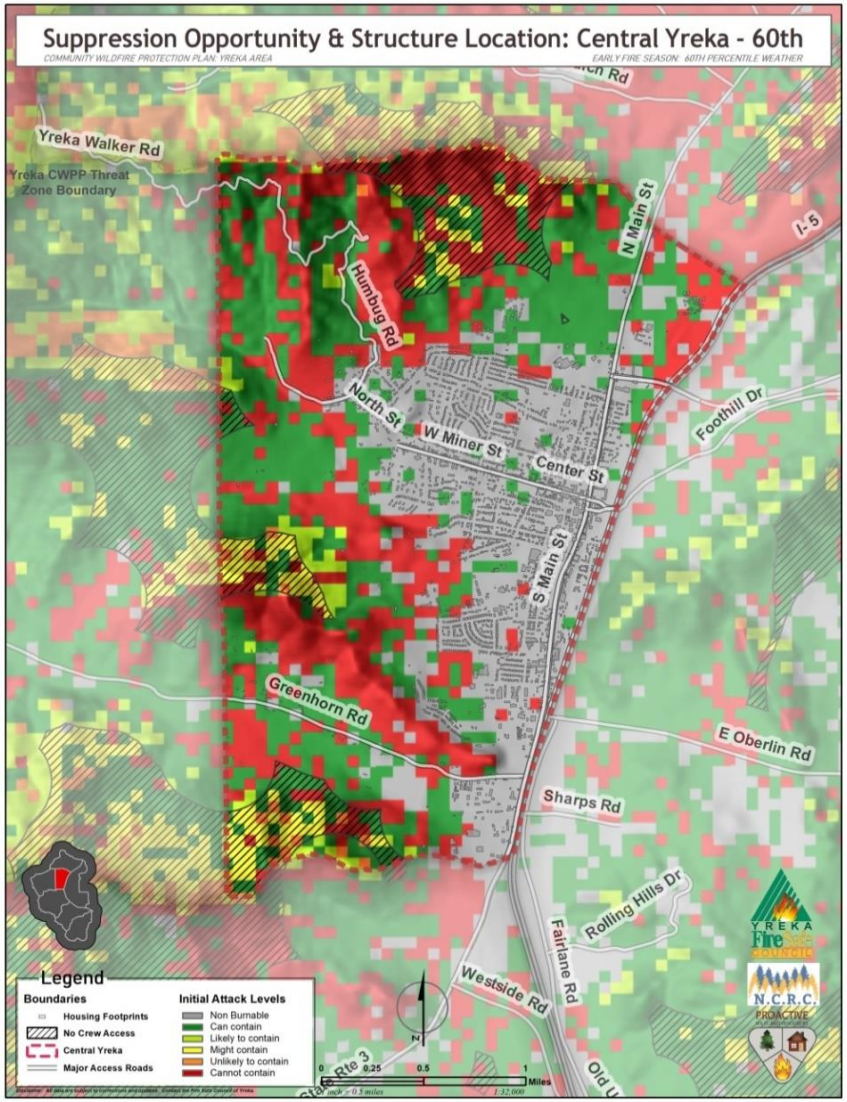
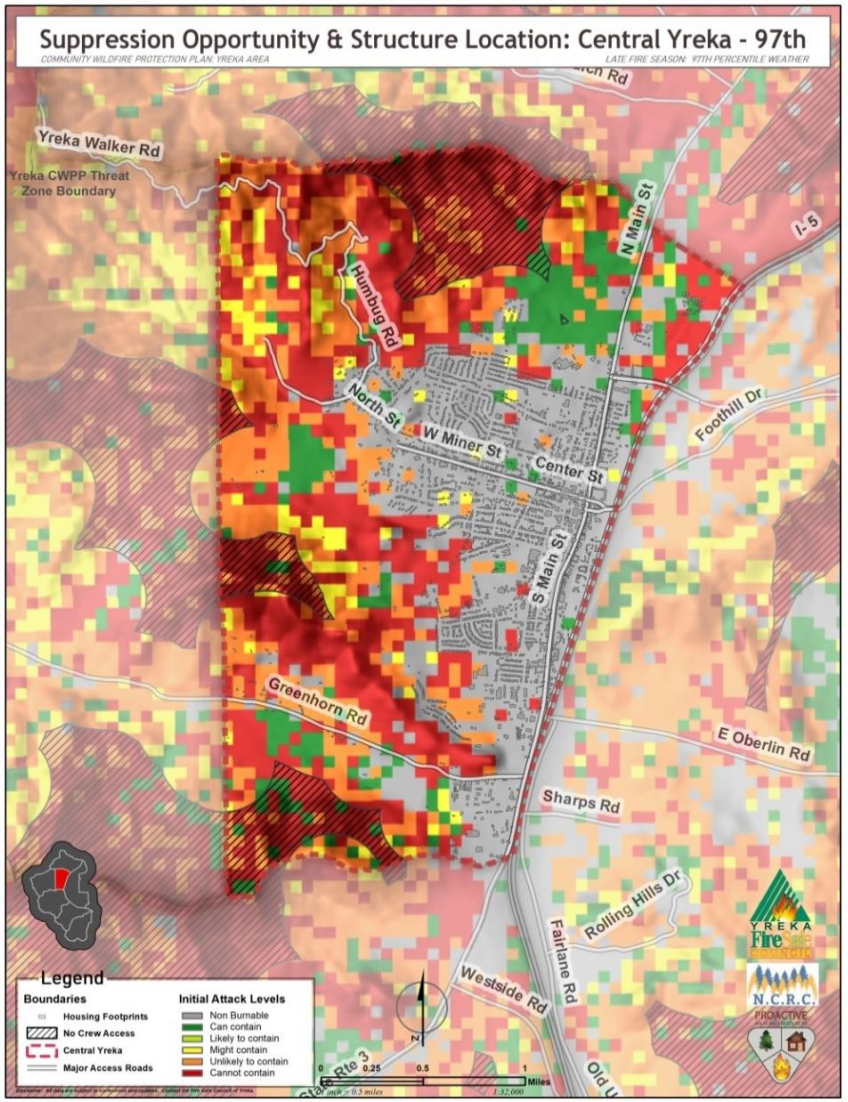


Figure PA3.6. *Suppression Opportunity - Late Fire Season*



Note: The darker the color, the higher flame length/fire intensity.

Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season	
	Not Modeled	Can Contain	Likely to Contain	Might Contain	Not Likely to Contain	Cannot Contain	Total
# Acres / % Acres	1,312 / 31.0%	1,402 / 33.1%	85 / 2.0%	143 / 3.4%	38 / 0.9%	1,252 / 29.6%	4,232 / 100%
No. of Structures	2,596	392	3	0	0	223	3,214
# Acres / % Acres	1,312 / 31.0%	400 / 9.5%	0 / 0%	193 / 4.5%	876 / 20.7%	1,452 / 34.3%	4,232/ 100%
No. of Structures	2,596	129	0	68	198	223	3,214

Outcomes/Results

The above analyses provided outputs that were further used to conduct a proximity analysis of structures within 180 feet of IASO map areas with extremely high resistance to control. The results of this work are found in Figures PA3.7 and PA3.8. These tools are for utilization by property owners and local agencies in continued dialogue about where work should be focused, with a goal of potentially accelerating hazard fuel reduction activities within the PA. An annual review of the following items is recommended: 1) local initiatives for fuel treatment, 2) annual actions to protect residential homes and neighborhoods by creating defensible space, and 3) changes such as fires or other actions that may have modified onsite fuels since the prior review.

1. Structures Potentially at Risk

Figure PA3.7 was developed by creating Zones of Concern that extend 300 feet beyond identified structures.

- Red Polygons: Areas within the red polygons are zones that are at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in modeled "Not-Likely-to-Contain" and "Cannot Contain" areas.
- Orange Polygons: These are areas identified that will become more at risk later in the summer and into the fall before the first rains.

Property owners should perform all of their structure hardening and defensible space work as identified in *Section 6* and *Appendix A*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.

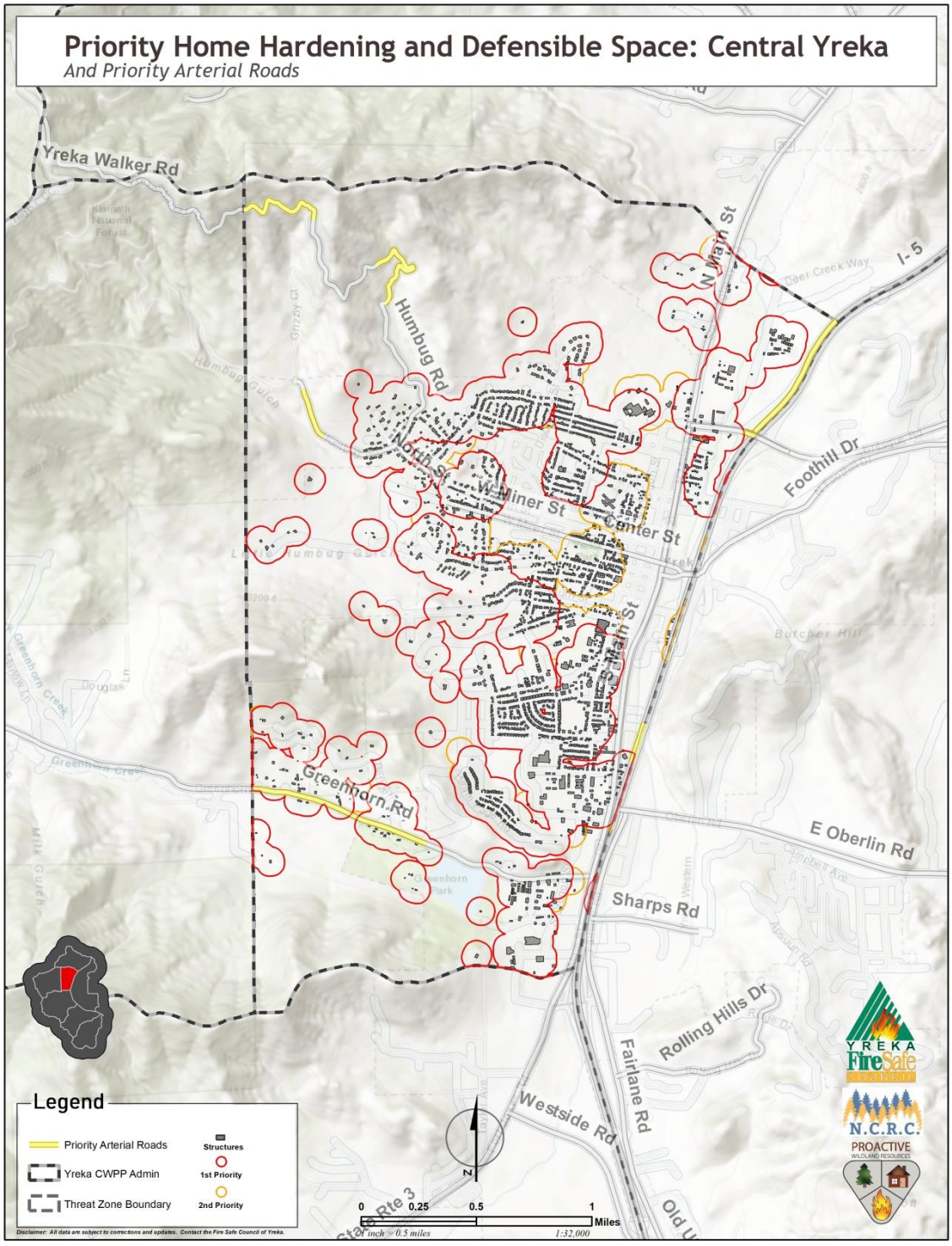
Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

2. Priority Areas/Roads for Hazardous Fuels Mitigation

Figure PA3.8 was developed by overlaying the Burn Probability analysis and Initial Attack Suppression Modeling outputs and suggests the following key priorities for treatments:

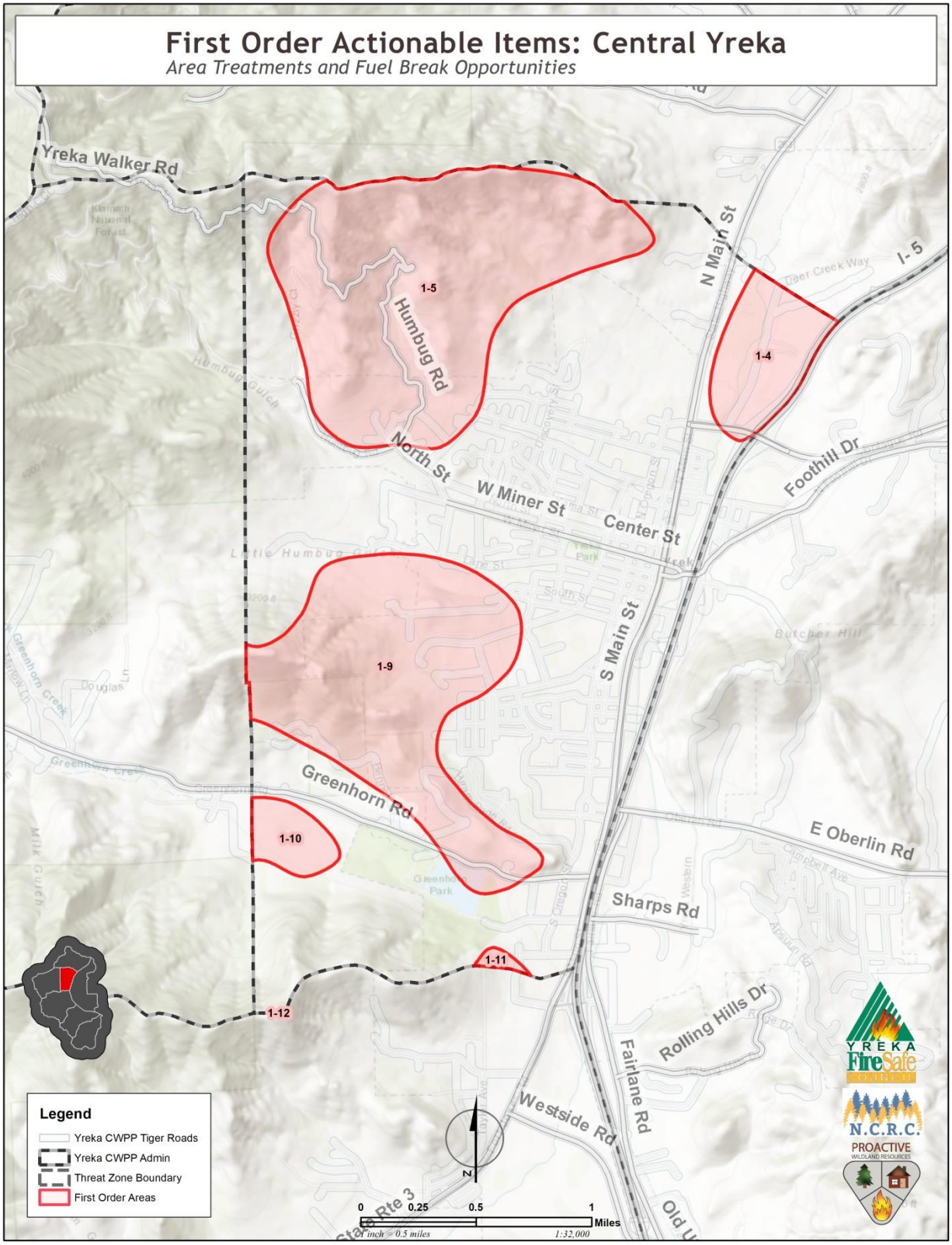
1. Roads/Infrastructure (areas detailed in Figure PA3.7)
2. Areas where structures are highlighted by red polygons
3. Oak Ridge Mobile Estates
4. The general west side of the PA
5. The northern extent of the PA
6. The ridge that divides Greenhorn and The Pines PA
7. The area depicted as 1-11 in Figure PA3.8 (the area between the COS Campus and Greenhorn Park)

Figure PA3.7. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Structures Potentially at Risk		
	Late Season Only	**Early and Late Season**
No. of Structures	521	1,718

Figure PA3.8. *Priority Areas for Hazardous Fuels Mitigation*



Wildfire Protection Resources

The City of Yreka is a Local Responsibility Area. What that means is that the City has full responsibility for all fires regardless of type. CAL FIRE has wildfire suppression responsibility for all the areas surrounding the City of Yreka. As wildland fires are a threat to State Responsibility Areas (SRA), CAL FIRE will respond and fully support all wildland fire situations, as they pose a threat to SRA lands. The Yreka Fire department will have full responsibility with CAL FIRE as a partner. The nearest CAL FIRE station is in Yreka. Hornbrook and Ft Jones CAL FIRE stations would respond in most cases. The South Yreka, Montague, and Grenada Fire Departments would respond under mutual aid agreements.

This plan is not intended to modify the provisions of any other agreements which a participating entity may have entered or may enter in the future.

It is the goal of the Agencies to this Agreement to achieve common standards within each agencies' best interest, recognizing differing agency missions and mandates. Each agency to this plan recognizes that other agency standards are reasonable, prudent, and acceptable. This clause is not intended to affect the jurisdictional agency's land management standards.

Primary concerns and challenges faced by protection forces

#1 = Access-ingress/egress are among the highest priority safety elements in a wildfire emergency.

- ✓ 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

Contact information for local fire protection services

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  401 W. Miner St, Yreka, CA 96097 | (530) 841-2383

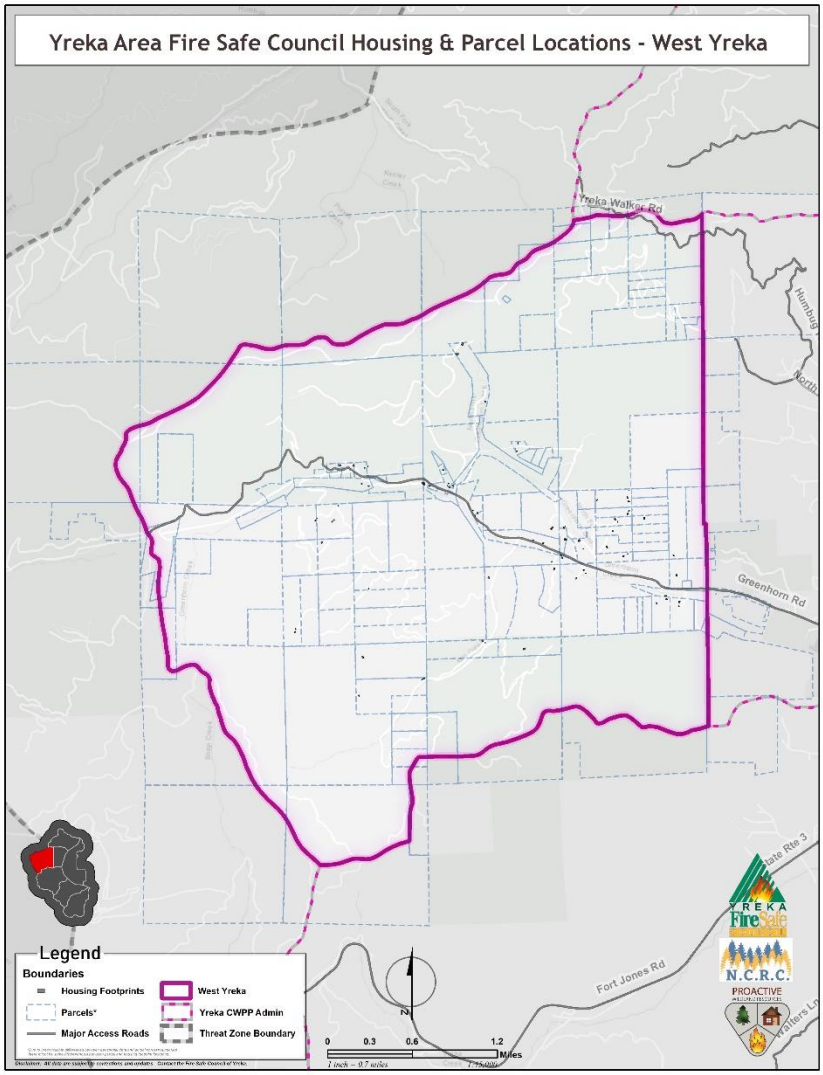
- **South Yreka Fire Protection District**
  3420 Easy St. Yreka, CA 96097 | (530) 842-1477
- **Montague Fire Department**
  121 South 10th St, Montague, CA 96064 | (530) 459-5343
- **Grenada Fire Protection District**
  6055 4th Ave, Grenada, CA | (530) 436-2200

General Overview/Description

The West Yreka PA is bounded by the Central Yreka PA to the east, and the ridge defined by Soap Creek Ridge to the southwest, tying in with Mahogany Point (elevation 5,994 feet) and Montana Peak (elevation 5,758 feet), West Yreka PA to the west and The Pines PA to the south. The ridge that divides Long Gulch and Humbug Gulch is the dominant topographic feature. The highest elevation in the PA is the northwest corner at about 4,200 feet. The lowest point is the junction of where the ridge comes down to Yreka Creek at an elevation of 2,540 feet. The other prominent topographic feature is the southern boundary which is the ridge that runs above Greenhorn Park and divides Greenhorn from Lime Gulch.

Yreka Creek dominates the lowest aspects of the area where it is to the west of the I-5.

Figure PA4.1. *Map of the West Yreka Planning Area*



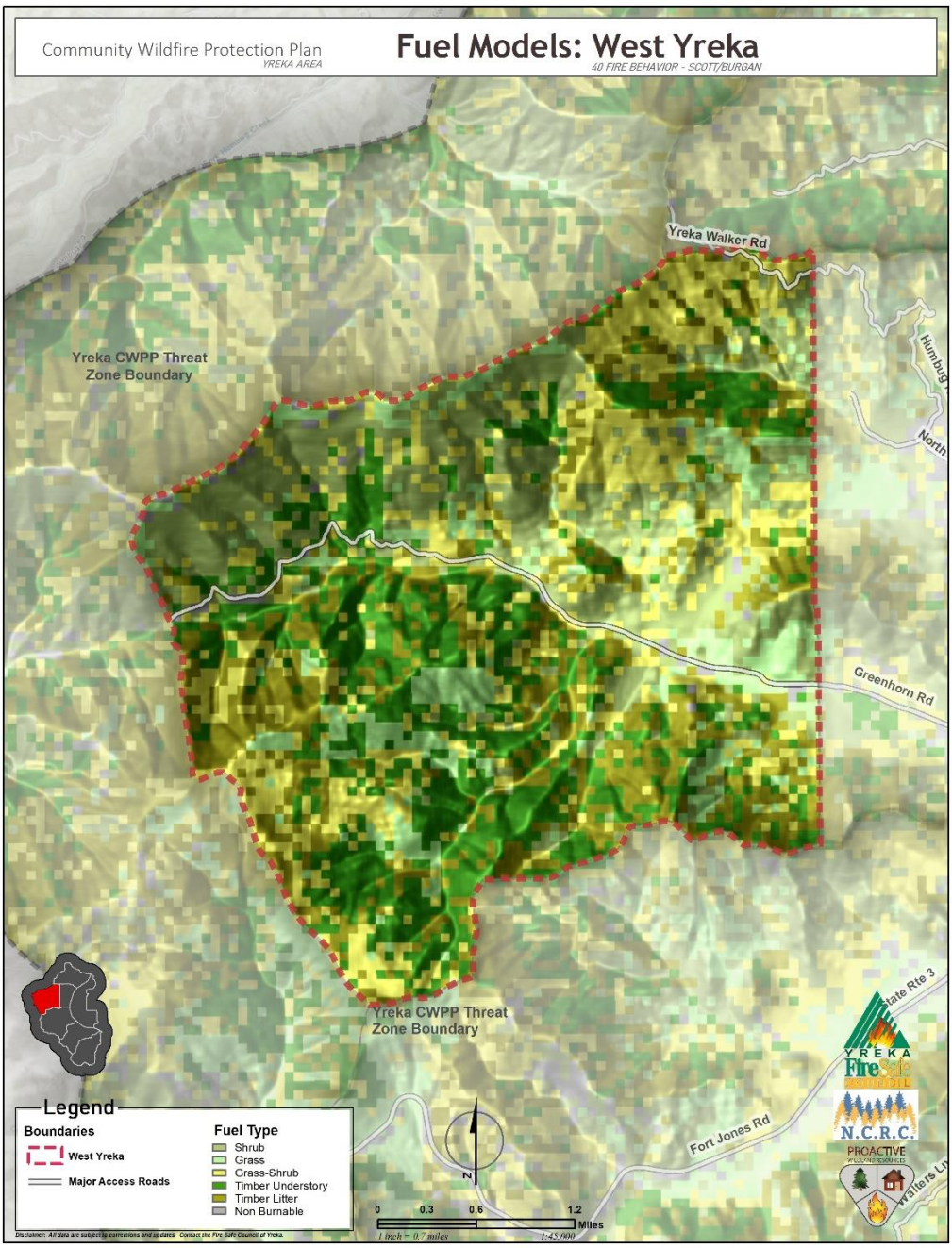
Wildland Fire Environment

Over 50% of the PA is covered in grass, grass/shrub and/or shrub (see Figure PA4.2, Fuel Models). These fuel types are subject to very rapid spread rates during hot, dry summer months which makes this PA especially vulnerable as the fire season progresses through summer and into fall. The defining ridge at the northern boundary and spur that comes off of it fall within the vicinity of high burn probabilities in a wildfire ignition (see Figures PA4.3 and PA 4.4, Burn Probability). The proximity of these areas to more densely populated areas deserves attention as the fire season progress. Fuel conditions and weather will also combine with almost 30% of the area presenting itself as difficult to suppress early in the fire season increasing to almost 75% difficult to suppress by late fire season (see Figures PA4.5 and PA 4.6, Suppression Opportunity).

Wind-driven wildfires are the most significant concern.

Key risks of fire starts include the Greenhorn Road corridor from residents and recreational use and lightning storms across the general area.

Figure PA4.2. *Fuel Models*



Acres/% Acres of Primary Fuel Types		
	Acres	% Acres
Grass	817	10.0%
Grass/Shrub	1,815	22.3%
Shrub	1,770	21.8%
Timber Litter	1,661	20.4%
Timber Understory	1,988	24.4%
Slash/Blowdown		
Non-modeled	84	1.0%
Total	**8,134**	**100%**

Analysis of Expected Fire Behavior

Wildfires respond to weather, fuels (vegetation), and topography. Wind - primarily due to downdrafts from lightning storms or strong prevailing winds - is the most critical weather factor influencing fire behavior. Fuels are typically lighter and fires can be more easily suppressed especially in the lower and mid-slope areas of this PA earlier in the fire season. As the fire season progresses, wildfires become more problematic as summer temperatures increase and fuel moistures decrease.

Figures PA 4.3, 4.4, 4.5 and 4.6 and their data tables are unique to this PA and were derived from flame length and rate of spread analyses and for two distinct (early and late) fire season situations (see *Section 5* for a methodology overview and definitions).

The outcomes were considered for two distinct but equally important fire characteristics:

1. Burn Probability

Figures PA4.3 and PA4.4 illustrate Burn Probability, providing an assessment of what areas and which types of fuels are likely to burn provided an ignition. The darker red a shaded area is, the more likely it is to burn. This is important information to determine where hazardous fuel mitigation may need to be focused. There were 1,541 late fire season fires modeled for this PA.

- **Early Fire Season (60th percentile weather)**
  The largest fire modeled during early fire season simulations was 16 acres. The average fire size was 8.7 acres.

- **Late Fire Season (97th percentile weather)**
  The largest fire modeled during late summer burned 7,356 acres. The largest area burned within the PA was 5,109 acres. Average acres for the simulation 5,309 and average acres within the PA 3,592 acres burned.

Wildfires burn across PA boundaries and simply expand in size and scope wherever burnable material exists. A fire that starts close to one PA boundary may predominantly burn into an adjoining area. When referring below to the "largest" fire burned, this is the total size across all PA boundaries. When "within" the PA, this is the total acres burned within the PA boundary.

2. Initial Attack Suppression Opportunity

Figures PA4.5 and PA4.6 display the outputs from the Initial Attack Suppression Opportunity modeling. This map combines predicted fireline intensity (flame length) and the rate of fire spread data, providing a more detailed and comprehensive view of potential safety concerns, problem fire hazard areas, and access issues. This tool can be useful to first responders to identify and address area-specific levels of suppression difficulty prior to an emergency. It can also be used by property owners to identify areas where actionable items can be targeted for home hardening/defensible space work and/or targeted hazardous fuels reduction work.

Areas in green are where wildfires are likely to be contained, with areas in red indicating areas of increased suppression difficulty. Areas that present themselves as red early in the season will be of concern throughout the entire season. These areas are a focus for hazard fuels mitigation work as they increase wildfire risk for a longer period of time.

Areas in gray are where: 1) structures are present in a dense enough fashion that no burnable fuel model could be assigned, or 2) areas that will not burn, e.g., irrigated fields, pavement, etc. *Recent fire events across California have shown that areas within the gray can still burn*; the closer to the wildland urban interface, the more vigilance is recommended.

No fire department can be expected to prevent all structural losses in a Wildland Urban Interface (WUI) setting. The potential for a wildfire to outpace suppression efforts means that all property owners in WUI areas accept a high degree of risk as well as responsibility.

Figure PA4.3. *Burn Probability - Early Fire Season*

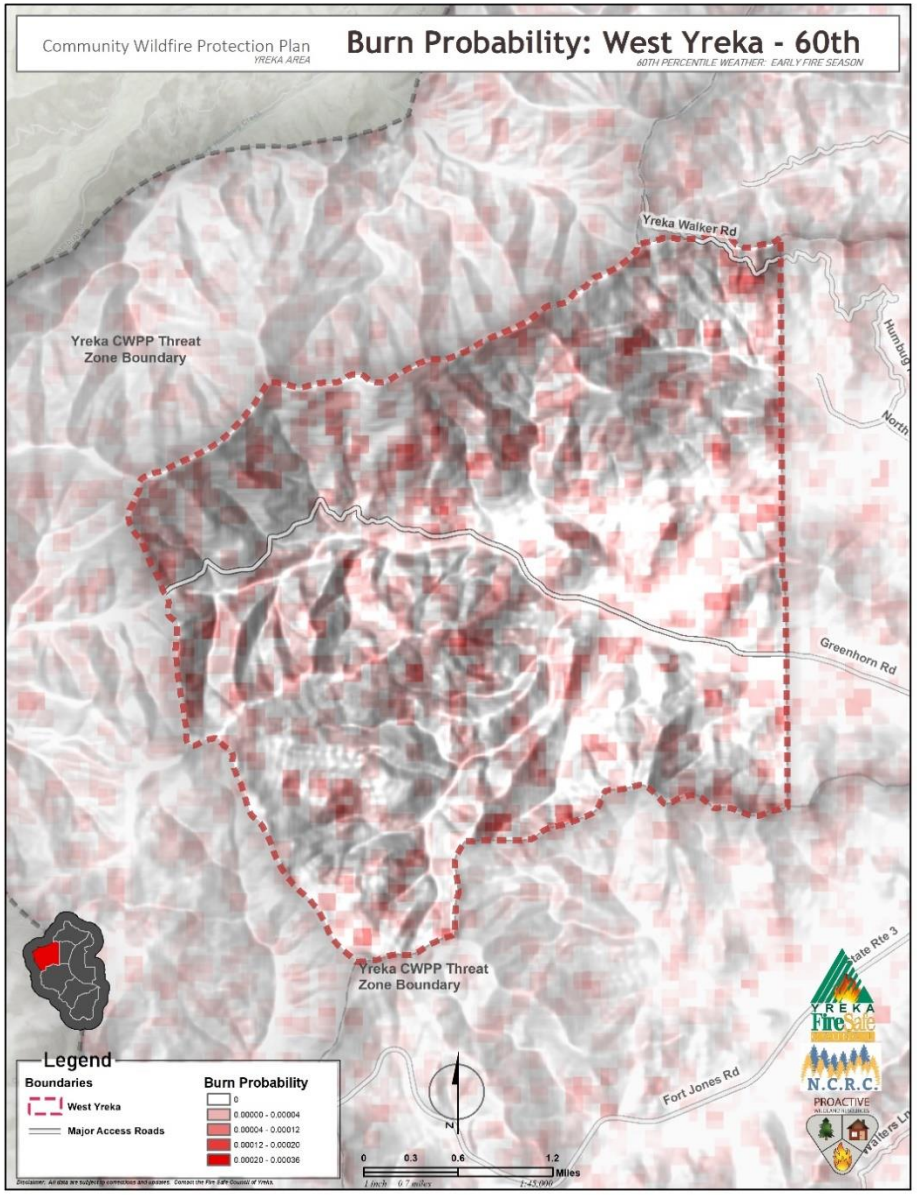
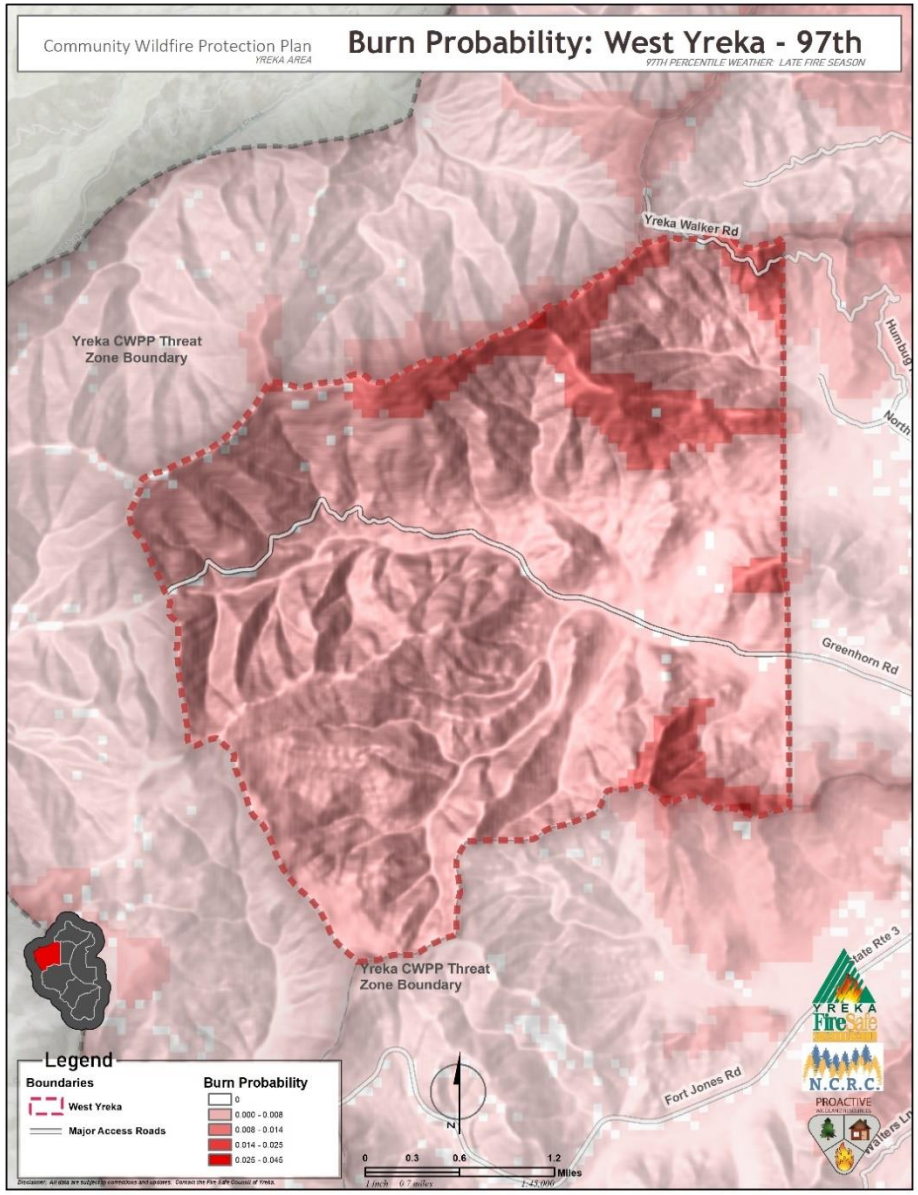


Figure PA4.4. *Burn Probability - Late Fire Season*



Number of Modeled Fires by Fire Size Class				Early Fire Season			Late Fire Season	
Size Class in Acres	**Class A: 0 to .25**	**Class B: .25 to 10**	**Class C: 10 t0 100**	**Class D: 100 to 300**	**Class E: 300 to 1K**	**Class F: 1K to 5K**	**Class G: 5K +plus**	**Total**
# of Fires / % Fires		667 / 84%	123 / 16%					790 / 100%
# of Fires / % Fires				43 / 2.8%	643 / 41%	843 / 54.7%	23 / 1.5%	1543 / 100%

Figure PA4.5. *Suppression Opportunity - Early Fire Season*

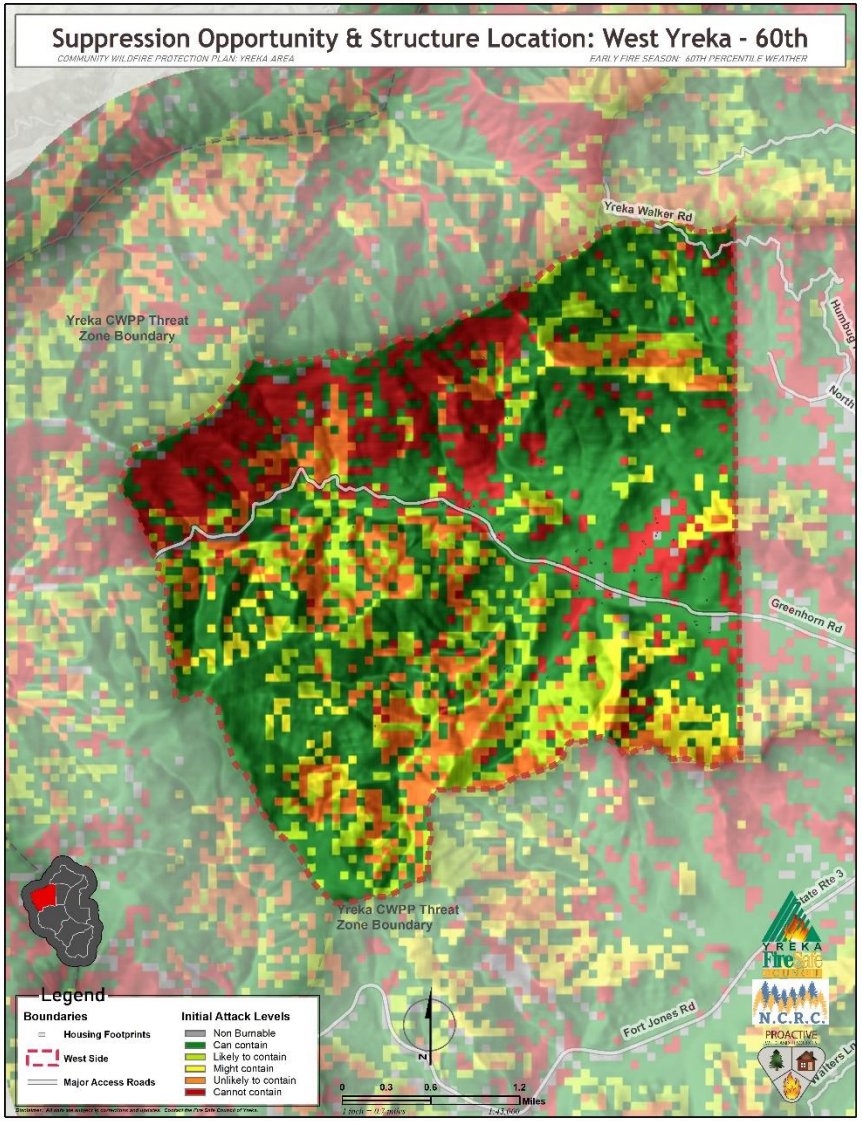
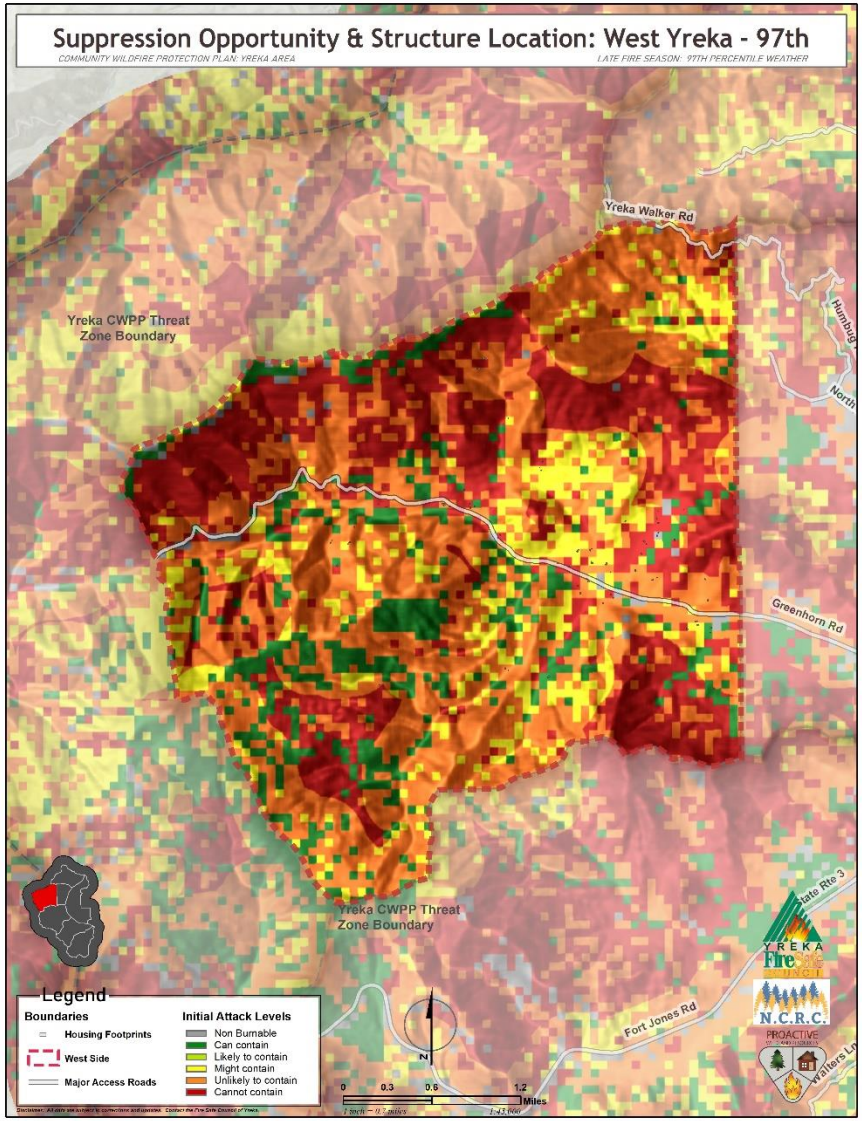


Figure PA4.6. *Suppression Opportunity - Late Fire Season*



Note: The darker the color, the higher flame length/fire intensity.

Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season	
	Not Modeled	Can Contain	Likely to Contain	Might Contain	Not Likely to Contain	Cannot Contain	Total
# Acres / % Acres	84 / 1.0%	4,002 / 49.2%	1,202 / 14.8%	429 / 5.3%	1,122 / 13.8%	1,296 / 15.9%	8,134 / 100%
No. of Structures	6	57	4	1	2	32	102
# Acres / % Acres	84 / 1.0%	974 / 12.0%	0 / 0%	1,031 / 12.5%	3,801 / 46.7%	2,263 / 27.8%	8,134 / 100%
No. of Structures	6	12	0	15	35	34	102

Outcomes/Results

The above analyses provided outputs that were further used to conduct a proximity analysis of structures within 180 feet of IASO map areas with extremely high resistance to control. The results of this work are found in Figures PA4.7 and PA4.8. These tools are for utilization by property owners and local agencies in continued dialogue about where work should be focused, with a goal of potentially accelerating hazard fuel reduction activities within the PA. An annual review of the following items is recommended: 1) local initiatives for fuel treatment, 2) annual actions to protect residential homes and neighborhoods by creating defensible space, and 3) changes such as fires or other actions that may have modified onsite fuels since the prior review.

1. Structures Potentially at Risk

Figure PA4.7 was developed by creating Zones of Concern that extend 300 feet beyond identified structures.

- Red Polygons: Areas within the red polygons are zones that are at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in modeled "Not-Likely-to-Contain" and "Cannot Contain" areas.
- Orange Polygons: These are areas identified that will become more at risk later in the summer and into the fall before the first rains.

Property owners should perform all of their structure hardening and defensible space work as identified in *Section 6* and *Appendix A*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.

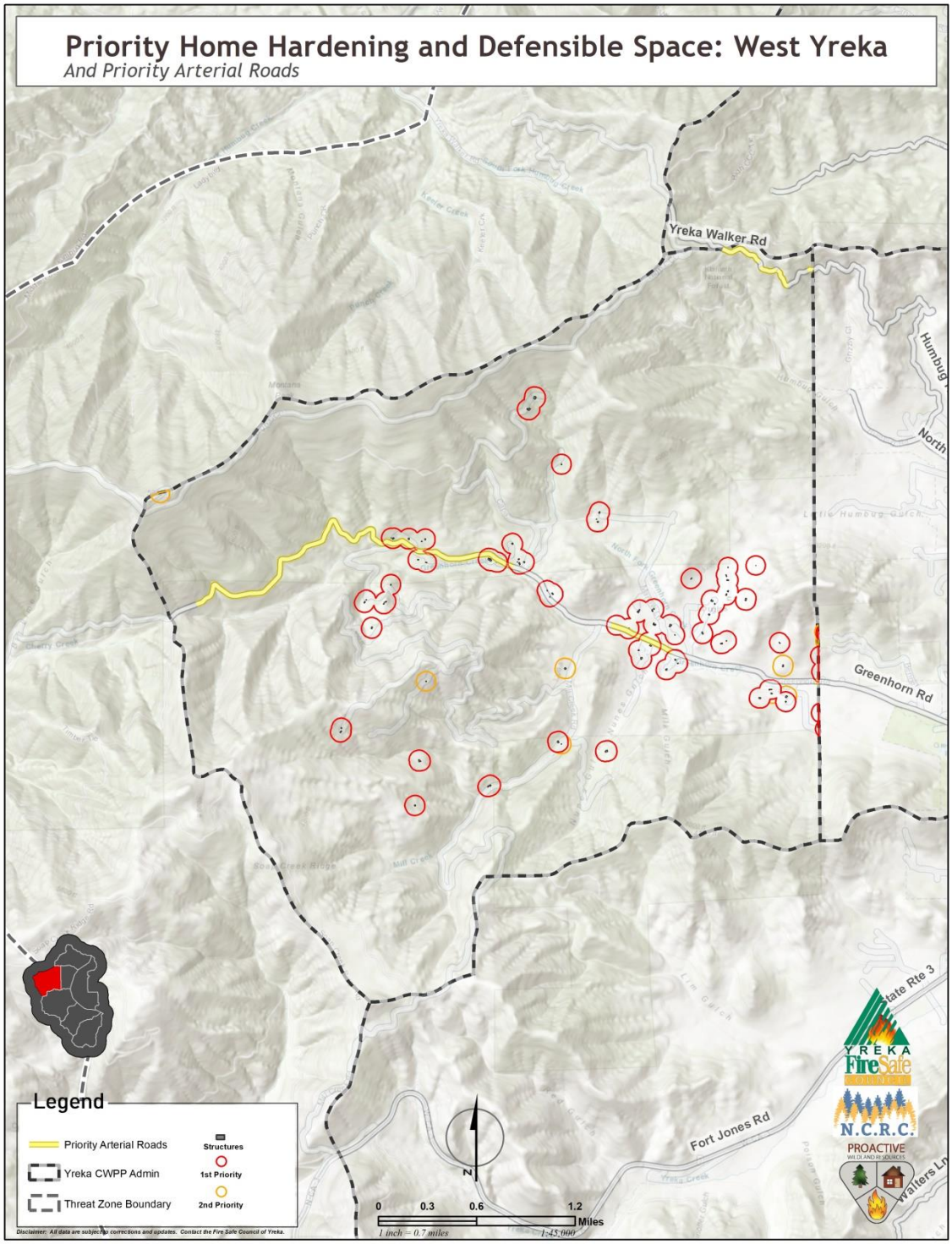
Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

2. Priority Areas/Roads for Hazardous Fuels Mitigation

Figure PA4.8 was developed by overlaying the Burn Probability analysis and Initial Attack Suppression Modeling outputs and suggests the following key priorities for treatments:

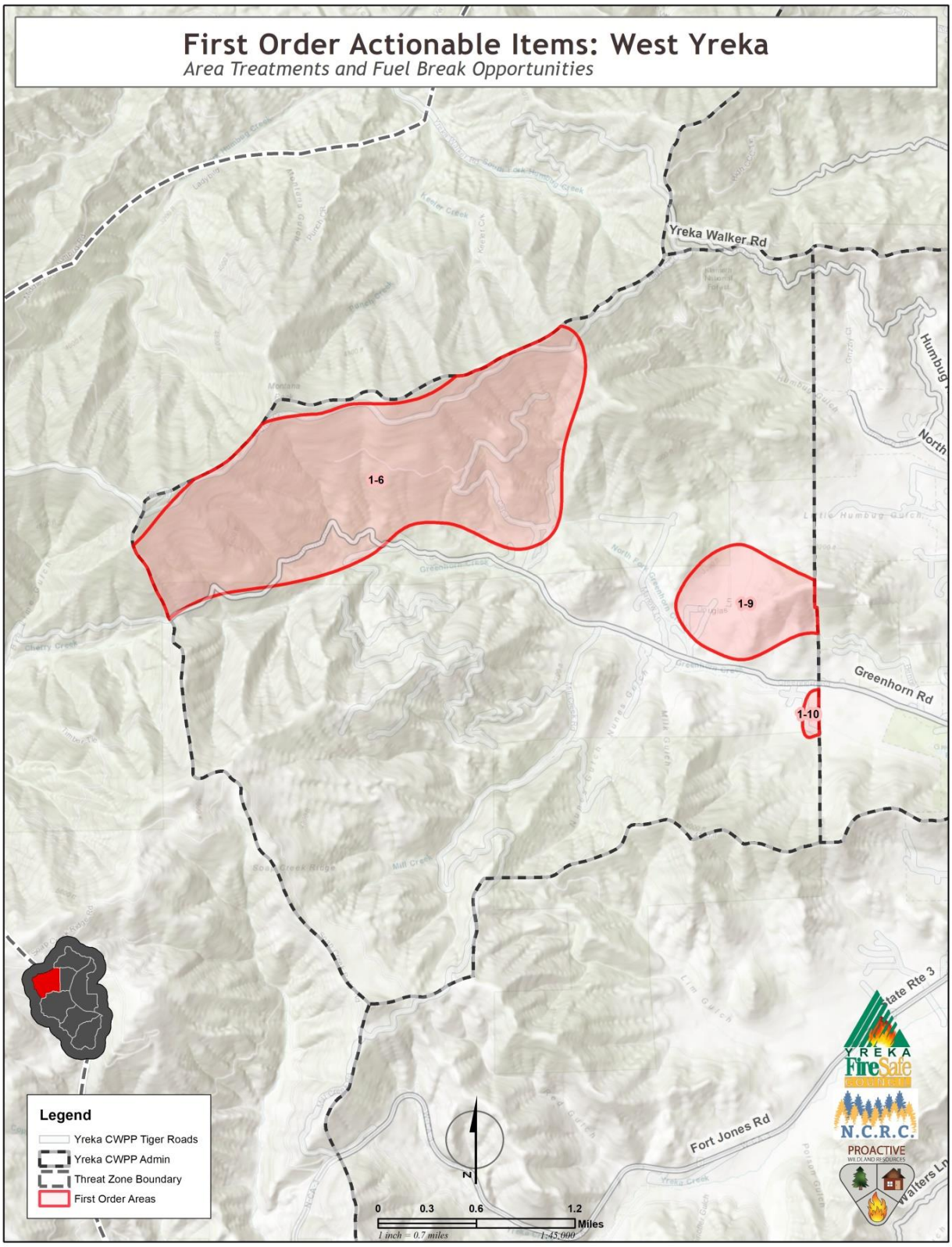
1. Roads/Infrastructure (areas detailed in Figure PA4.7)
2. Areas where structures are highlighted by red polygons
3. The Ridge at the north of the PA (Humbug Ridge Polygon 1-6)
4. The areas just west of the Yreka City PA labelled 1-6 and 1-9 in Figure PA4.8 below.

Figure PA4.7. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Structures Potentially at Risk		
	Late Season Only	**Early and Late Season**
No. of Structures	4	75

Figure PA4.8. *Priority Areas for Hazardous Fuels Mitigation*



Wildfire Protection Resources

CAL FIRE has wildfire suppression responsibility for of the West Side Planning. Yreka City Fire Department and South Yreka Fire Protection District will work in partnership with CAL FIRE under mutual aid agreements. The nearest stations are in Yreka and South Yreka. The Hornbrook, Montague and Grenada Fire Departments would also respond under mutual aid agreements.

This plan is not intended to modify the provisions of any other agreements which a participating entity may have entered or may enter in the future.

It is the goal of the Agencies to this Agreement to achieve common standards within each agencies' best interest, recognizing differing agency missions and mandates. Each agency to this plan recognizes that other agency standards are reasonable, prudent, and acceptable. This clause is not intended to affect the jurisdictional agency's land management standards.

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

Contact information for local fire protection services

State Resources (CAL FIRE)

- **CAL FIRE Yreka Station**
  1809 Fairlane Rd, Yreka, CA 96097 | (530) 842-4359
- **CAL FIRE Hornbrook Station**
  14638 Bradley Henley Rd, Hornbrook, CA 96044 | (530) 475-3582

Local Community & Volunteer Resources

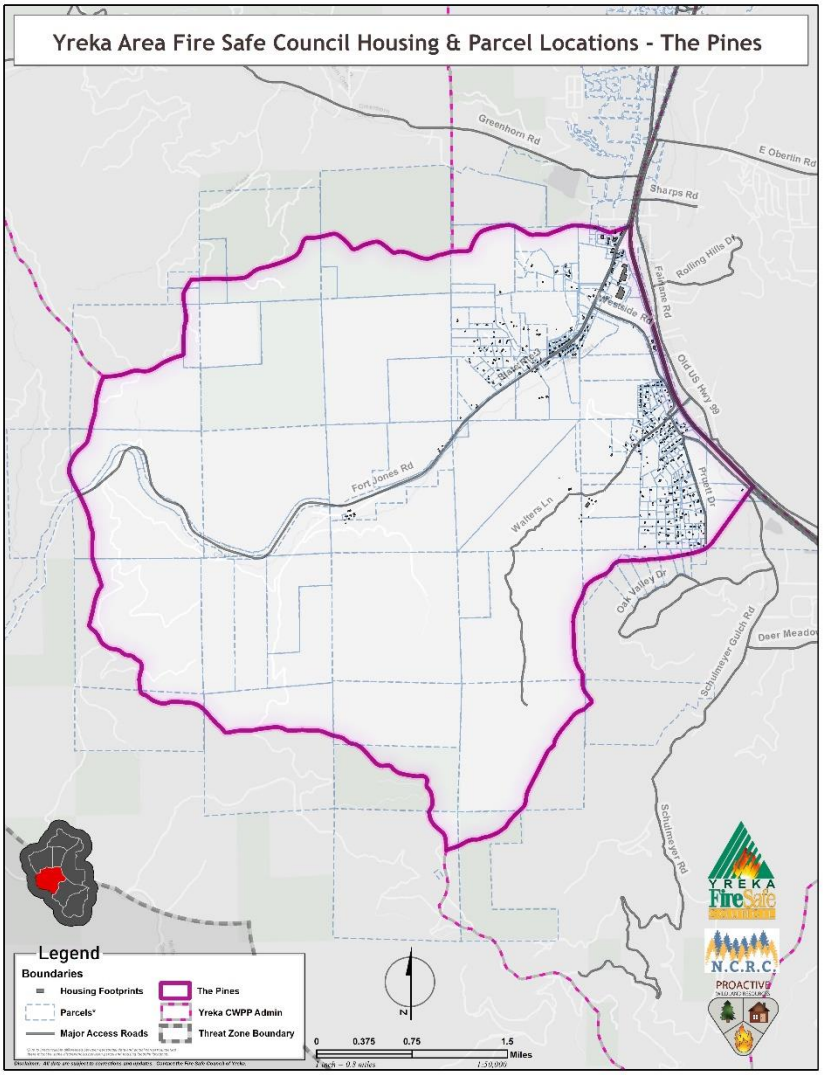
- **Yreka Fire Department**
  401 W. Miner St, Yreka, CA 96097 | (530) 841-2383
- **South Yreka Fire Protection District**
  3420 Easy St. Yreka, CA 96097 | (530) 842-1477
- **Montague Fire Department**
  121 South 10th St, Montague, CA 96064 | (530) 459-5343
- **Grenada Fire Protection District**
  6055 4th Ave, Grenada, CA | (530) 436-2200

5. The Pines

General Overview/Description

The Pines PA lies to the south of the Central Yreka PA. It is about 10,513 acres in size. The PA is bounded by the Central Yreka PA to the north, and the Schulmeyer Gulch PA to the southeast. It is dissected by Highway 3 (Yreka Creek) and Walters Lane (Walters Gulch). The highest elevations are found along the ridge between Walters Gulch and Oak Valley/Schulmeyer Gulch. The highest point is where the southern-most extension of the PA border makes a dramatic turn to the north. This elevation is about 5,440 feet. The lowest point is where Yreka Creek runs under the I-5 freeway in the northeast corner at an elevation of 2,711 feet.

Figure PA5.2. *Map of The Pines Planning Area*



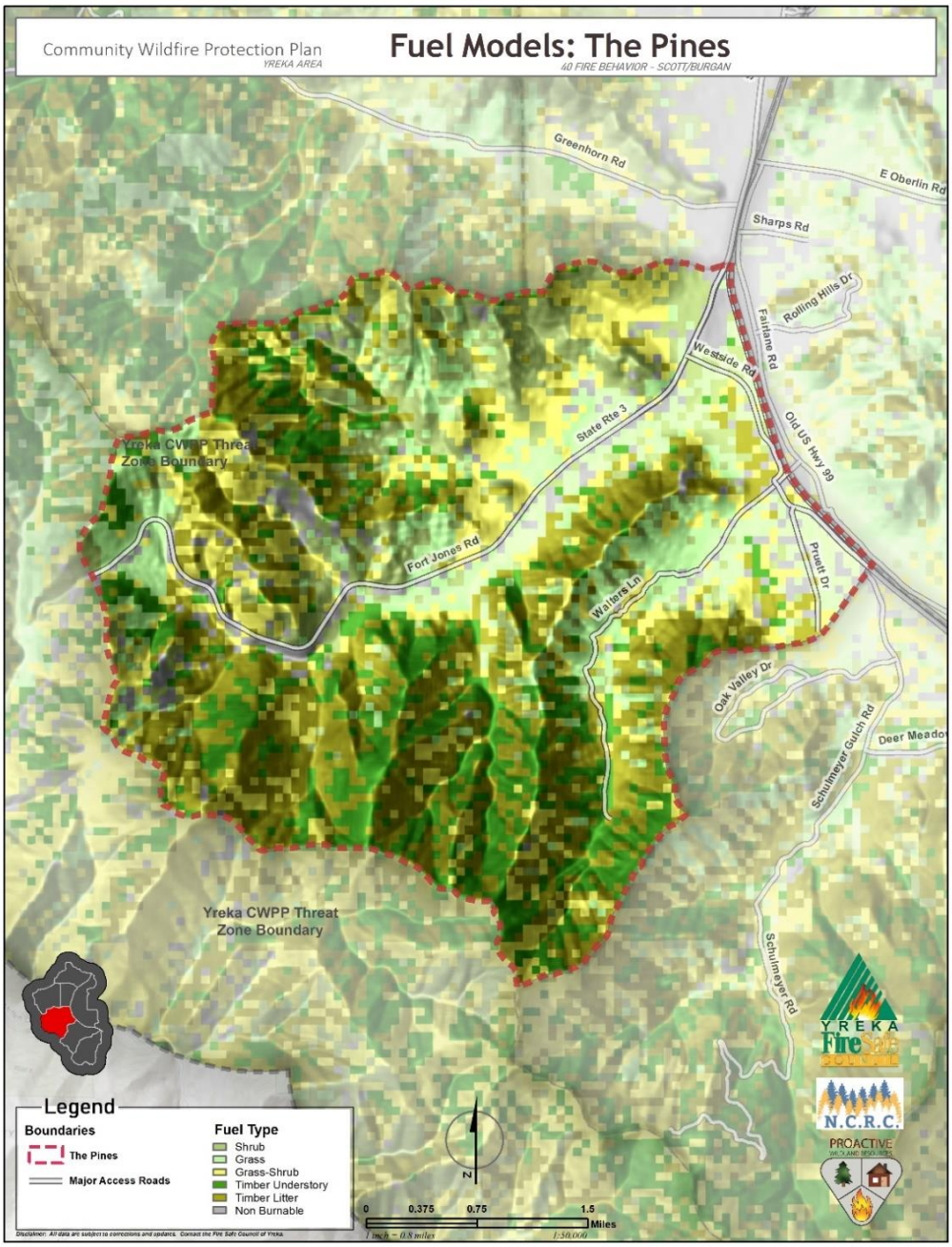
Wildland Fire Environment

Almost 50% of the PA is covered in grass, grass/shrub and/or shrub and 45% in timber related fuels (Figure PA5.2, Fuel Models). These fuel types are subject to very rapid spread rates during hot, dry summer months which make this PA especially vulnerable as the fire season progresses through summer and into fall. The northern most ridge in the PA and the ridge that divides Yreka Creek and Walters Gulch fall within the vicinity of high burn probabilities in a wildfire ignition (Figures PA5.3 and PA5.4). Fuel conditions and weather combine presenting slightly over 20% of the area as difficult to suppress early in the fire season increasing to almost 70% difficult to suppress by late fire season (Figures PA5.5 and PA 5.6, Suppression Opportunity). The proximity of these areas to zones of population deserves attention, as the fire season progress.

Wind-driven wildfires are the most significant concern.

Key risks of fire starts include the Highway 3. Both the lower end of Highway 3 and the lower end of Walters Gulch have high concentrations of homes. Lightning storms also present the risk of random fire starts.

Figure PA5.2. *Fuel Models*



Acres/% Acres of Primary Fuel Types - The Pines		
	Acres	% Acres
Grass	1,669	15.9%
Grass/Shrub	1,943	18.5%
Shrub	1,457	13.9%
Timber Litter	2,994	28.5%
Timber Understory	1,784	17.0%
Slash/Blowdown		
Non-burnable	667	6.3%
Total	**10,514**	**100%**

Analysis of Expected Fire Behavior

Wildfires respond to weather, fuels (vegetation), and topography. Wind - primarily due to downdrafts from lightning storms or strong prevailing winds - is the most critical weather factor influencing fire behavior. Fuels are typically lighter and fires can be more easily suppressed especially in the lower and mid-slope areas of this PA earlier in the fire season. As the fire season progresses, wildfires become more problematic as summer temperatures increase and fuel moistures decrease.

Figures PA5.3, PA5.4, PA5.5 and PA5.6 and their data tables are unique to this PA and were derived from flame length and rate of spread analyses and for two distinct (early and late) fire season situations (see *Section 5* for a methodology overview and definitions).

The outcomes were considered for two distinct but equally important fire characteristics:

1. Burn Probability

Figures PA5.3 and PA5.4 illustrate Burn Probability, providing an assessment of what areas and which types of fuels are likely to burn provided an ignition. The darker red a shaded area is, the more likely it is to burn. This is important information to determine where hazardous fuel mitigation may need to be focused.

One of the outputs from the Burn Probability modeling is the size of the modeled fires after two burning periods. This knowledge aids in understanding how fires want to burn and to what extent they might burn. There were 1,821 late fire season fires modeled for this PA.

- **Early Fire Season (60th percentile weather)**
  The largest fire modeled during early fire season simulations was 20 acres. The average fire size was 8.3 acres.

- **Late Fire Season (97th percentile weather)**
  The largest fire modeled during late summer burned 5,500 acres. The largest area burned within the PA was 4,376 acres. Average acres for the simulation was 1,681 and average acres within the PA 668 acres burned.

Wildfires burn across PA boundaries and simply expand in size and scope wherever burnable material exists. A fire that starts close to one PA boundary may predominantly burn into an adjoining area. When referring below to the "largest" fire burned, this is the total size across all PA boundaries. When "within" the PA, this is the total acres burned within the PA boundary.

2. Initial Attack Suppression Opportunity

Figures PA5.5 and PA5.6 display the outputs from the Initial Attack Suppression Opportunity modeling. This map combines predicted fireline intensity (flame length) and the rate of fire spread data, providing a more detailed and comprehensive view of potential safety concerns, problem fire hazard areas, and access issues. This tool can be useful to first responders to

identify and address area-specific levels of suppression difficulty prior to an emergency. It can also be used by property owners to identify areas where actionable items can be targeted for home hardening/defensible space work and/or targeted hazardous fuels reduction work.

Areas in green are where wildfires are likely to be contained, with areas in red indicating areas of increased suppression difficulty. Areas that present themselves as red early in the season will be of concern throughout the entire season. These areas are a focus for hazard fuels mitigation work as they increase wildfire risk for a longer period of time.

Areas in gray are where: 1) structures are present in a dense enough fashion that no burnable fuel model could be assigned, or 2) areas that will not burn, e.g., irrigated fields, pavement, etc. *Recent fire events across California have shown that areas within the gray can still burn*; the closer to the wildland urban interface, the more vigilance is recommended.

No fire department can be expected to prevent all structural losses in a Wildland Urban Interface (WUI) setting. The potential for a wildfire to outpace suppression efforts means that all property owners in WUI areas accept a high degree of risk as well as responsibility.

Figure PA5.3. *Burn Probability - Early Fire Season*

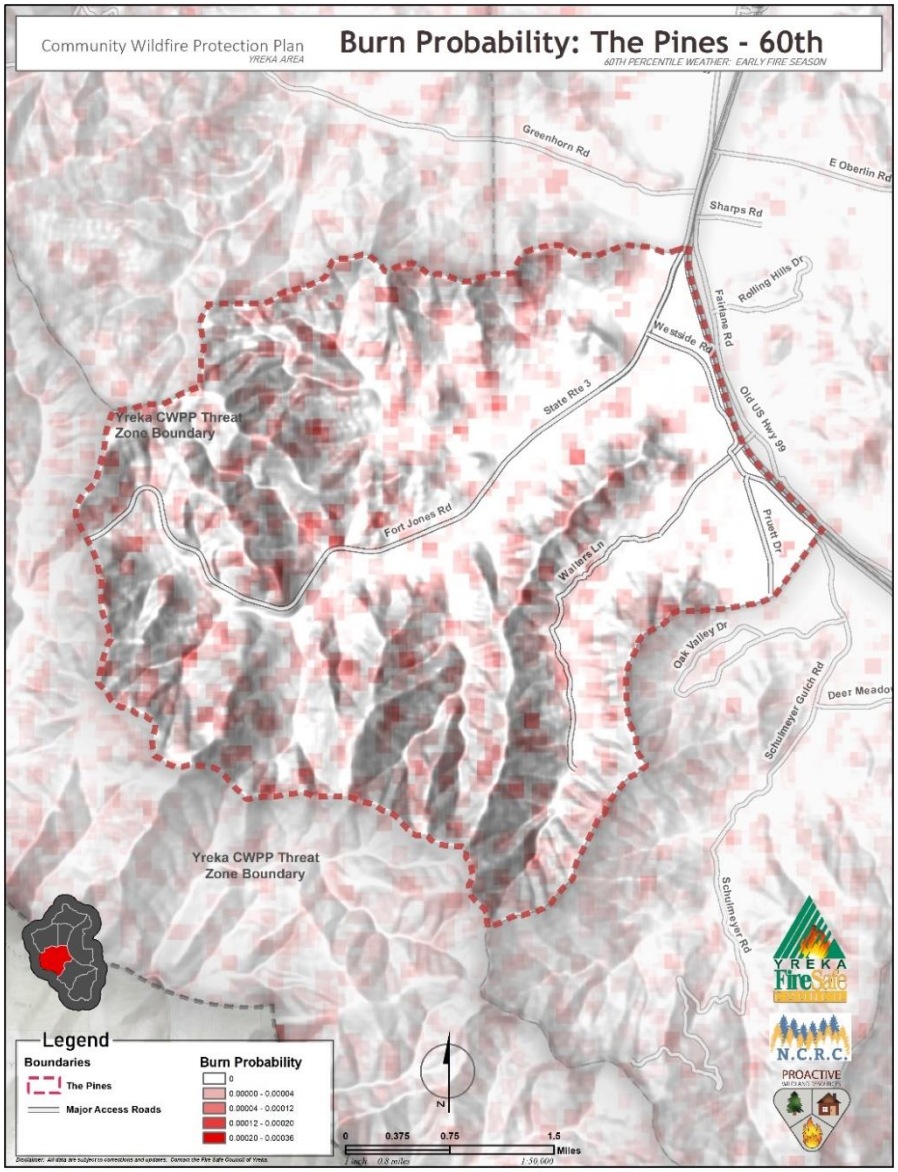
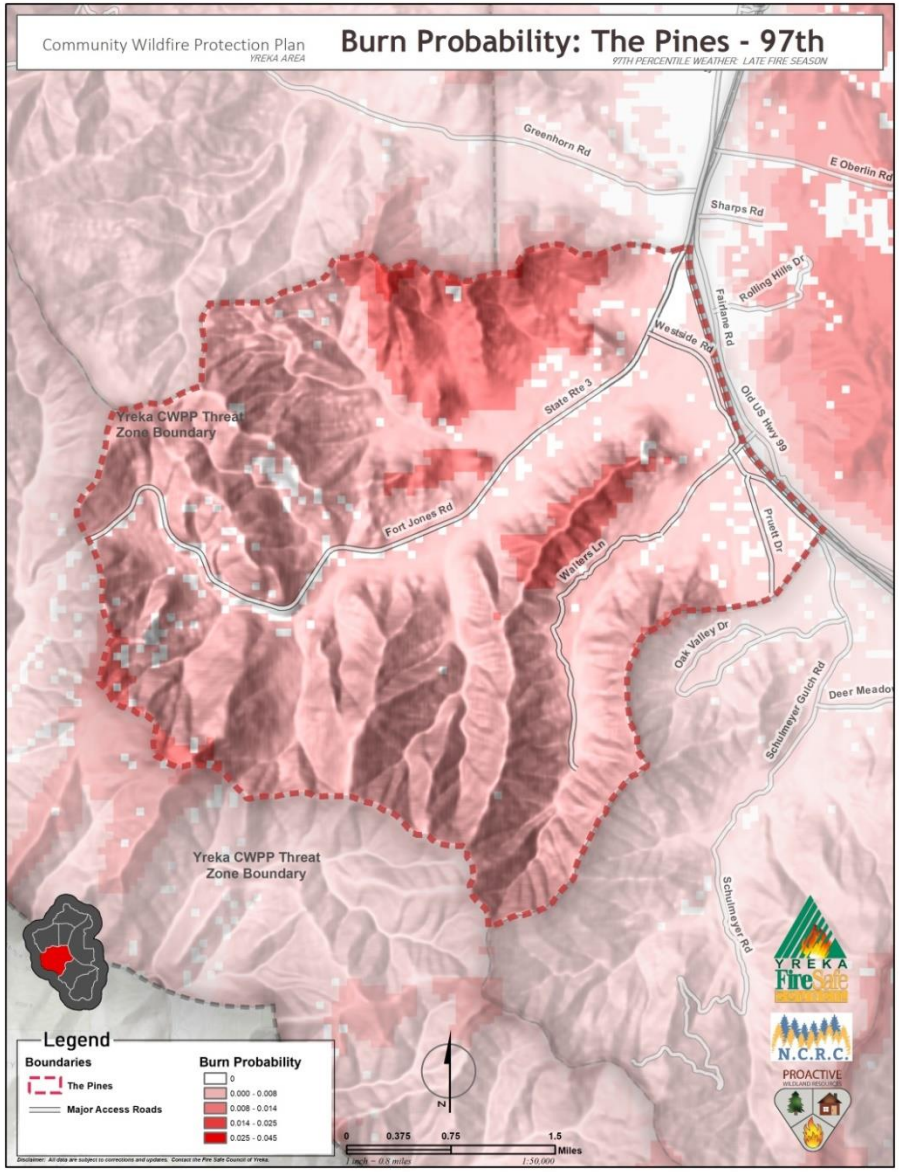


Figure PA5.4. *Burn Probability* **-***Late Fire Season*



Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season		
Size Class in Acres	**Class A: 0 to .25**	**Class B: .25 to 10**	**Class C: 10 t0 100**	**Class D: 100 to 300**	**Class E: 300 to 1K**	**Class F: 1K to 5K**	**Class G: 5K +plus**	**Total**
# of Fires / % Fires		797 / 91%	76 / 9%					873 / 100%
# of Fires / % Fires		2 / 0.1%	0 / 0	35 / 1.9%%	692 / 38.0%%	1,079 / 59.3%	13 / 0.7%	1,821 / 100%

Figure PA5.5. *Suppression Opportunity - Early Fire Season*

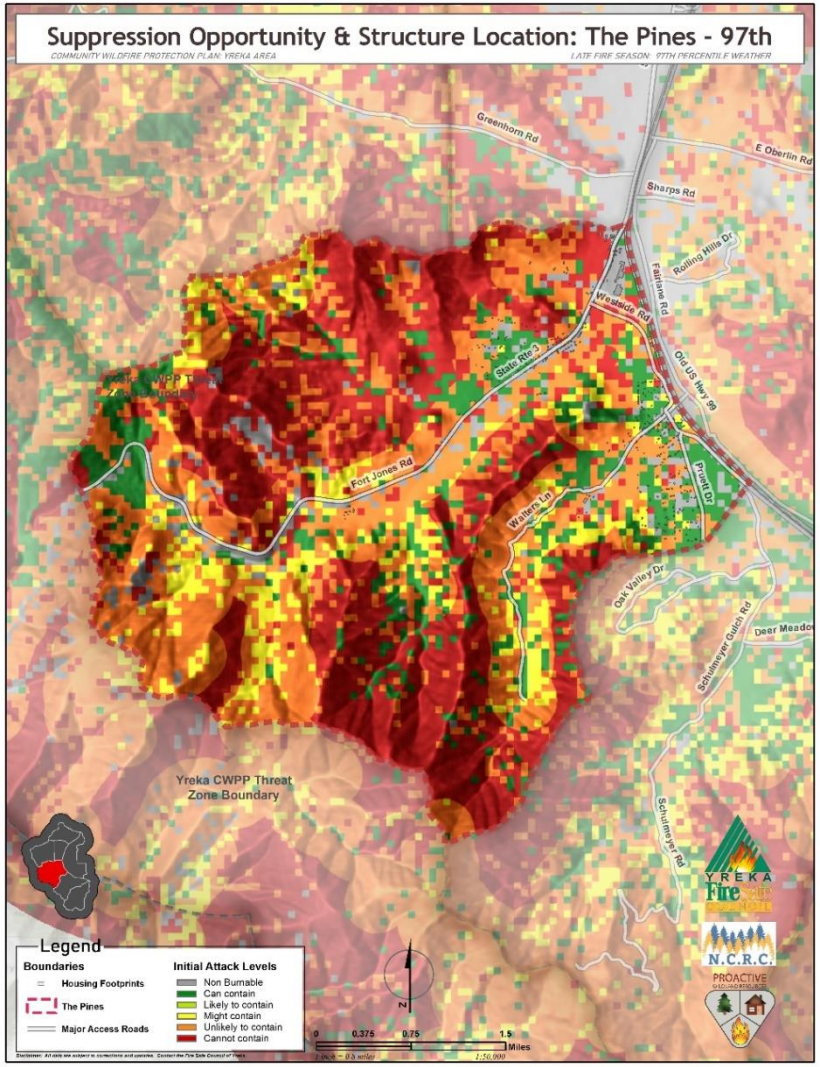
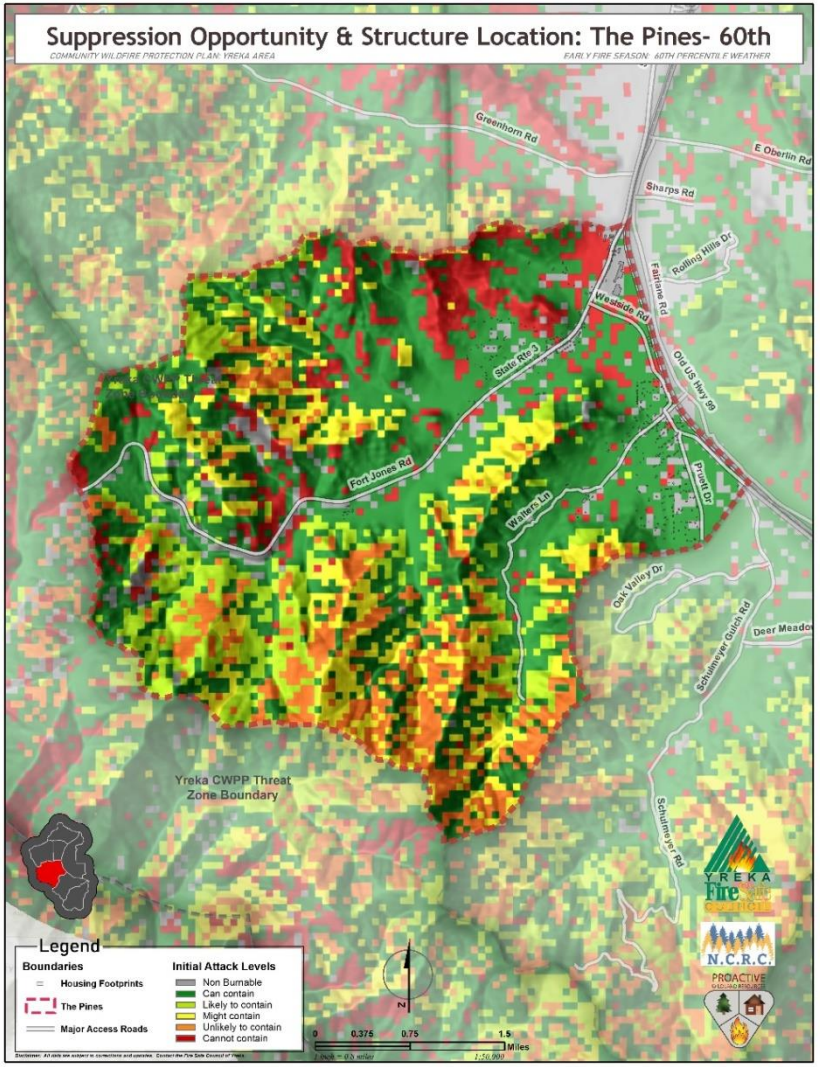


Figure PA5.6. *Suppression Opportunity - Late Fire Season*



Note: The darker the color, the higher flame length/fire intensity.

Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season	
	Not Modeled	Can Contain	Likely to Contain	Might Contain	Not Likely to Contain	Cannot Contain	Total
# Acres / % Acres	667 / 6.3%	5,167 / 49.2%	1,213 / 11.5%	1,221 / 11.6%	1,216 / 11.6%	1,028 / 9.8%	10,513 / 100%
No. of Structures	147	708	0	0	0	52	605
# Acres / % Acres	667 / 6.3%	1,443 / 13.7%	0 / 0%	982 / 9.3%	3,663 / 34.8%	3,758 / 35.7%	10,513 / 100%
No. of Structures	147	155	0	33	218	52	65

Outcomes/Results

The above analyses provided outputs that were further used to conduct a proximity analysis of structures within 180 feet of IASO map areas with extremely high resistance to control. The results of this work are found in Figures PA 1.7 and 1.8. These tools are for utilization by property owners and local agencies in continued dialogue about where work should be focused, with a goal of potentially accelerating hazard fuel reduction activities within the PA. An annual review of the following items is recommended: 1) local initiatives for fuel treatment, 2) annual actions to protect residential homes and neighborhoods by creating defensible space, and 3) changes such as fires or other actions that may have modified onsite fuels since the prior review.

1. Structures Potentially at Risk

Figure PA5.7 was developed by creating Zones of Concern that extend 300 feet beyond identified structures.

- Red Polygons: Areas within the red polygons are zones that are at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in modeled "Not-Likely-to-Contain" and "Cannot Contain" areas.
- Orange Polygons: These are areas identified that will become more at risk later in the summer and into the fall before the first rains.

Property owners should perform all of their structure hardening and defensible space work as identified in *Section 6* and *Appendix A*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.

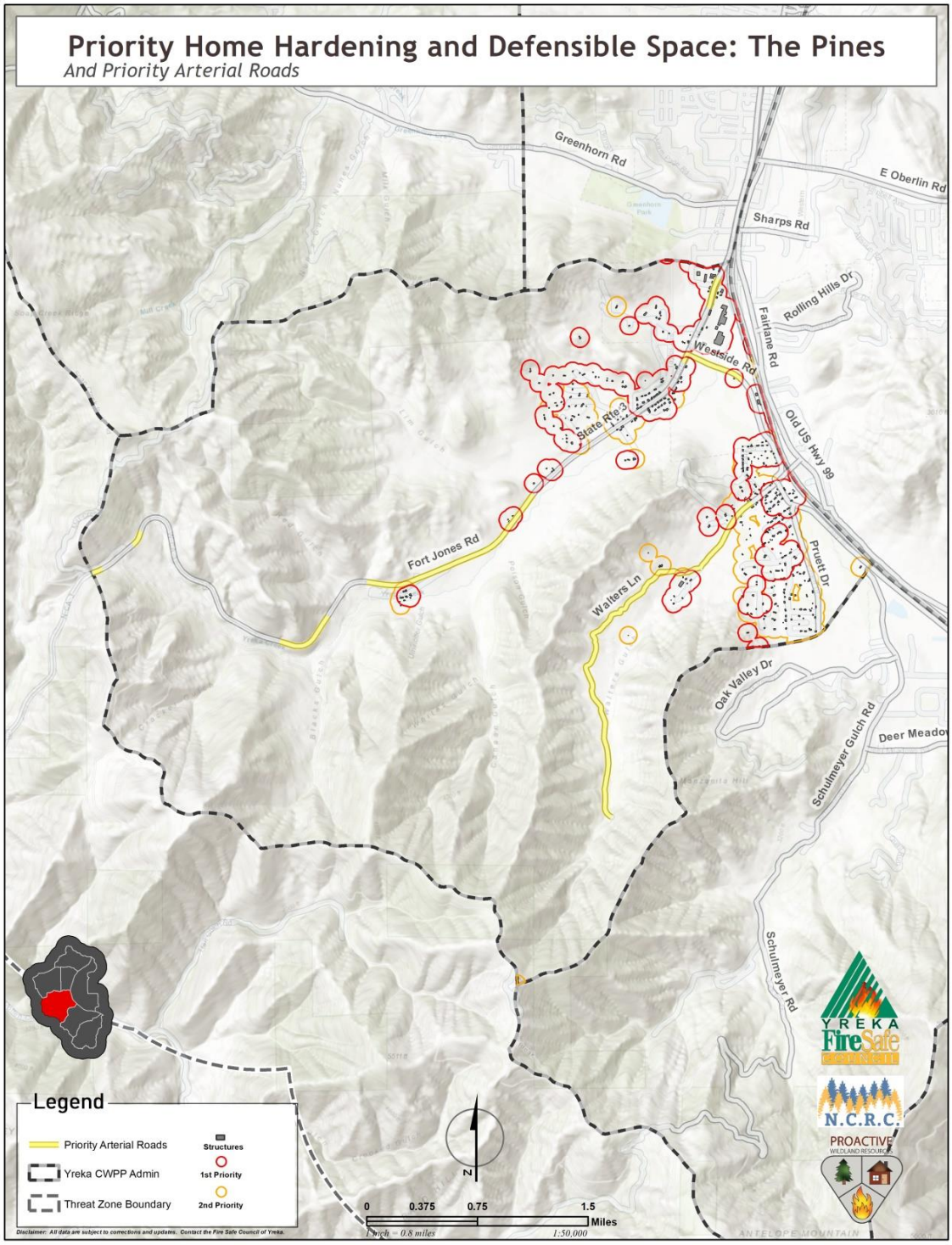
Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

2. Priority Areas/Roads for Hazardous Fuels Mitigation

Figure PA5.8 was developed by overlaying the Burn Probability analysis and Initial Attack Suppression Modeling outputs and suggests the following key priorities for treatments:

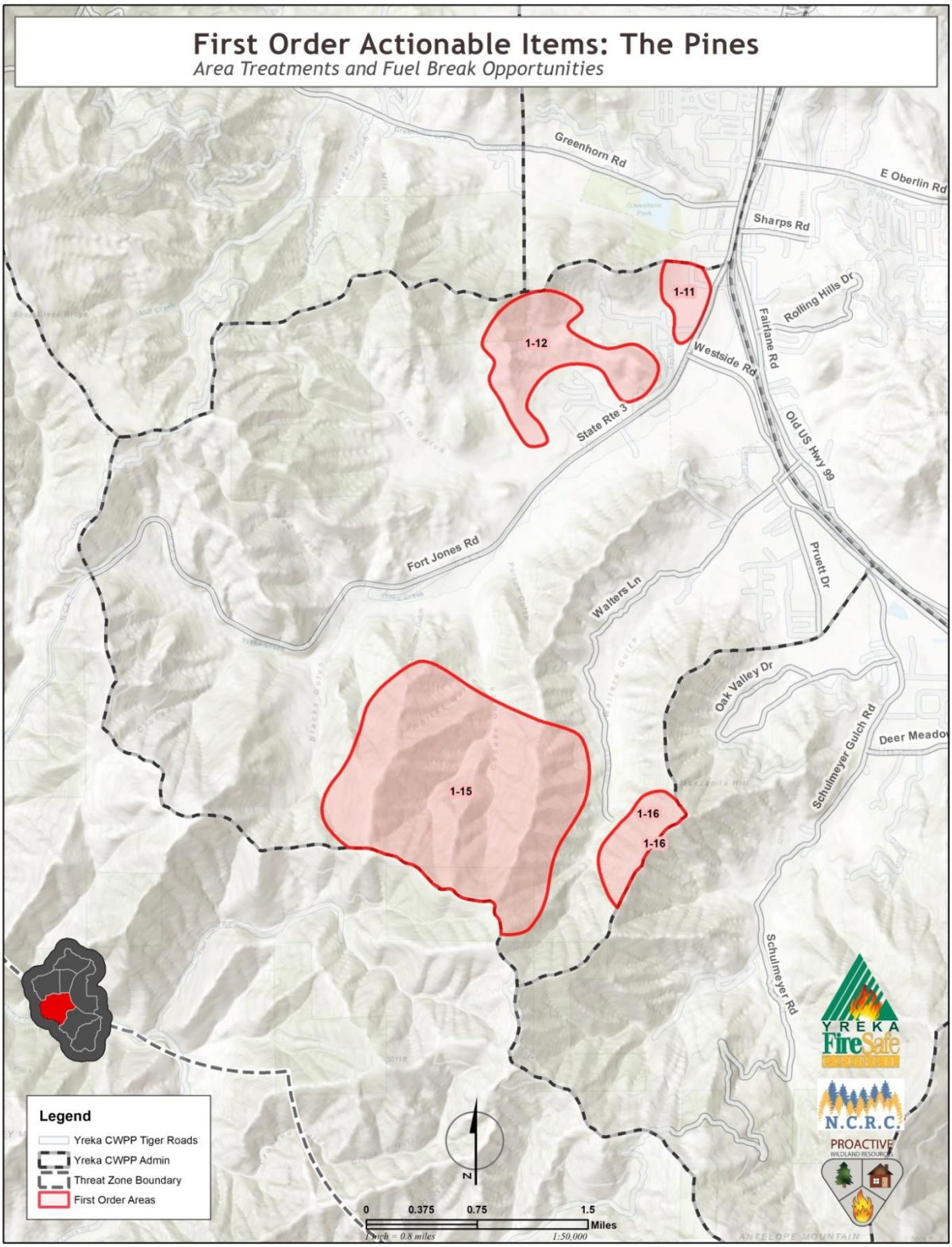
1. Roads/Infrastructure (areas detailed in Figure PA5.7)
2. Areas where structures are highlighted by red polygons.
3. There are areas of concern at the base of Highway 3 that need to be addressed. These stand out as they are proximate to areas of high use by motorists exiting and using services Area 1-10 and 1-11 is an area with many homes and structures. Highway 3 experiences high use.
4. The upper reaches of Walters Gulch Areas 1-13 and 1-14.

Figure PA5.7. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Structures Potentially at Risk		
	Late Season Only	**Early and Late Season**
No. of Structures	170	290

Figure PA5.8. *Priority Areas for Hazardous Fuels Mitigation*



Wildfire Protection Resources

CAL FIRE has wildland fire responsibility for the Pines. The South Yreka Fire Protection District has structure protection responsibility. Most fires in the area will generate a mutual response from has responsibility for most of the Yreka City Limits PA. CAL FIRE and South Yreka Fire Protection District has fire responsibilities for some of this area. They will work in partnership with CAL FIRE. The nearest stations are in Yreka and South Yreka. The Hornbrook, Montague, and Grenada Fire Departments would respond under mutual aid agreements.

This plan is not intended to modify the provisions of any other agreements which a participating entity may have entered or may enter in the future.

It is the goal of the Agencies to this Agreement to achieve common standards within each agencies' best interest, recognizing differing agency missions and mandates. Each agency to this plan recognizes that other agency standards are reasonable, prudent, and acceptable. This clause is not intended to affect the jurisdictional agency's land management standards.

Primary concerns and challenges faced by protection forces

#1 = Access-ingress/egress are among the highest priority safety elements in a wildfire emergency.

- ✓ 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

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- **Yreka Fire Department**
  401 W. Miner St, Yreka, CA 96097 | (530) 841-2383

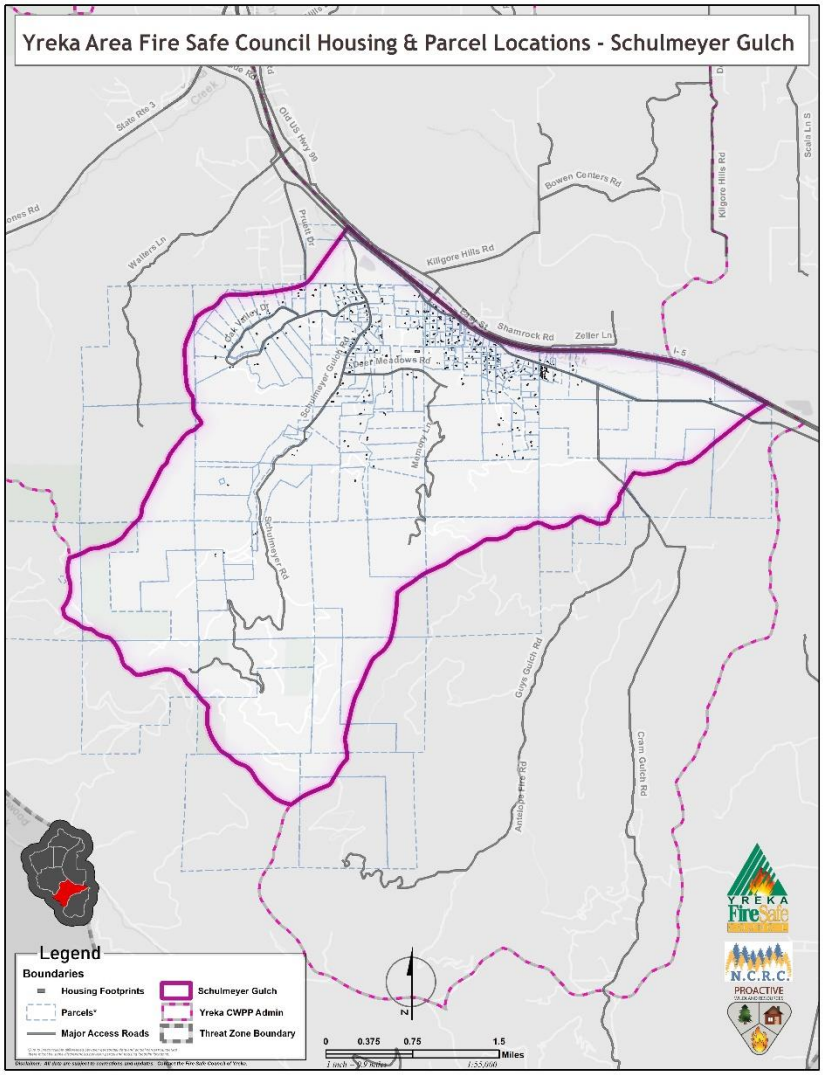
- **South Yreka Fire Protection District**
  3420 Easy St. Yreka, CA 96097 | (530) 842-1477
- **Montague Fire Department**
  121 South 10th St, Montague, CA 96064 | (530) 459-5343
- **Grenada Fire Protection District**
  6055 4th Ave, Grenada, CA | (530) 436-2200

6. Schulmeyer Gulch

General Overview/Description

The Schulmeyer Gulch PA lies to the south of The Pines PA and north of the Cram/Guys Gulch PA. It is about 8,270 acres in size. There are 511 homes or other structures larger than homes. Residents are concentrated in the lower reaches of Schulmeyer Gulch and along Old Highway 99. The ridge that divides Schulmeyer and Guys Gulch is the dominant feature. The highest point is the southern tip of the ridge. The elevation is about 6,100 feet. The lowest point is where Guys Gulch nears the northeast corner of the PA. The elevation there is 2,680 feet.

Figure PA6.1. *Map of Schulmeyer Gulch Planning Area*



Wildland Fire Environment

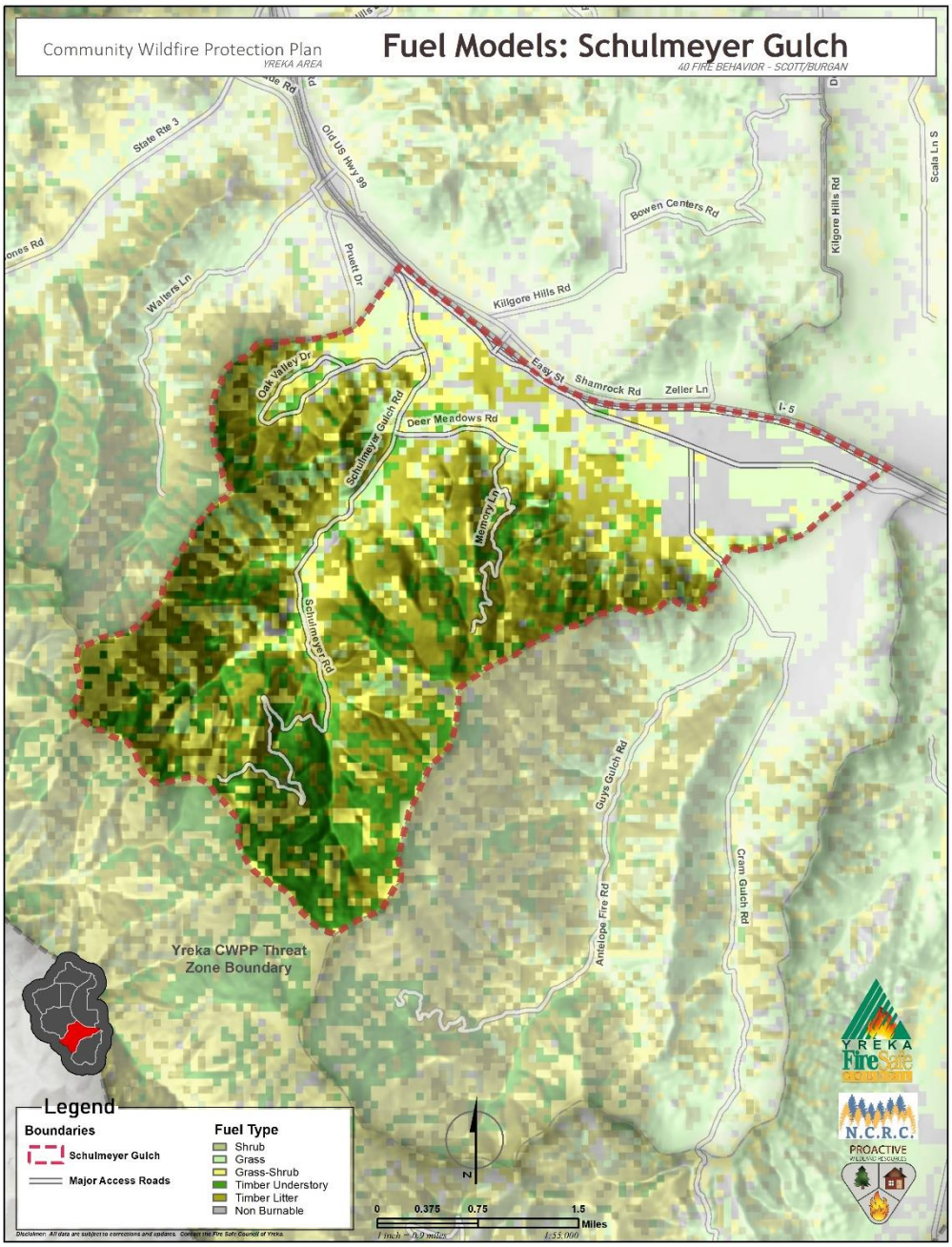
35% of the PA is covered in grass, grass/shrub and/or shrub and forested fuels comprise about 53% of the area (Figure 6.2, Fuel Models). These fuel types are subject to very rapid spread rates during hot, dry summer months which makes this PA especially vulnerable as the fire season progresses through summer and into fall. Forested areas tend to burn more slowly and can have a greater intensity and increased resistance to control. The tendency to want to burn based on the modeling is perhaps the lowest of all of the PAs. This is partially due to the forested fuels which are less susceptible to fire starts than the flashier, lighter brush/grass fuels (Figures PA6.3 and PA6.4, Burn Probability).

Early fire season fuel conditions and weather conditions present a scenario where only 14% of the modeled fire starts become problematic. As the season progresses, over half of the modeled late fire season starts can become troublesome to suppress (Figures PA6.5 and PA6.6, Suppression Opportunity). The proximity of these areas to zones of population deserves attention as the fire season progress. The absence of large Class G fires also speaks to the slower spread rates of the forested fuels.

Wind-driven wildfires are the most significant concern.

Key risks of fire starts include the inhabited areas of Schulmeyer Gulch and Old Highway 99 and the high traffic use along Old Highway 99. Summer lightning storms also present a high fire-start risk.

Figure PA6.2. *Fuel Models*



Acres/% Acres of Primary Fuel Types - Schulmeyer Gulch		
	Acres	% Acres
Grass	971	11.7%
Grass/Shrub	1,641	19.8%
Shrub	454	5.5%
Timber Litter	2,721	32.9%
Timber Understory	1,650	20.0%
Slash/Blowdown	0	0
Not Modeled	832	10.1%
Total	**8,270**	**100%**

Analysis of Expected Fire Behavior

Wildfires respond to weather, fuels (vegetation), and topography. Wind - primarily due to downdrafts from lightning storms or strong prevailing winds - is the most critical weather factor influencing fire behavior. Fuels are typically lighter and fires can be more easily suppressed especially in the lower and mid-slope areas of this PA earlier in the fire season. As the fire season progresses, wildfires become more problematic as summer temperatures increase and fuel moistures decrease.

Figures PA6.3, PA6.4, PA6.5 and PA6.6 and their data tables are unique to this PA and were derived from flame length and rate of spread analyses and for two distinct (early and late) fire season situations (see *Section 5* for a methodology overview and definitions).

The outcomes were considered for two distinct but equally important fire characteristics:

1. Burn Probability

Figures PA6.3 and PA6.4 illustrate Burn Probability, providing an assessment of what areas and which types of fuels are likely to burn provided an ignition. The darker red a shaded area is, the more likely it is to burn. This is important information to determine where hazardous fuel mitigation may need to be focused.

One of the outputs from the Burn Probability modeling is the size of the modeled fires after two burning periods. This knowledge aids in understanding how fires want to burn and to what extent they might burn. There were 1,608 late fire season fires modeled for this PA.

- **Early Fire Season (60th percentile weather)**
  The largest fire modeled during early fire season simulations was 16 acres. The average fire size was 7.9 acres.

- **Late Fire Season (97th percentile weather)**
  The largest fire modeled during late summer burned 4,898 acres. The largest area burned within the PA was 1,964 acres. Average acres for the simulation 1,667 and average acres within the PA 490 acres burned.

Wildfires burn across PA boundaries and simply expand in size and scope wherever burnable material exists. A fire that starts close to one PA boundary may predominantly burn into an adjoining area. When referring below to the "largest" fire burned, this is the total size across all PA boundaries. When "within" the PA, this is the total acres burned within the PA boundary.

2. Initial Attack Suppression Opportunity

Figures PA6.5 and PA6.6 display the outputs from the Initial Attack Suppression Opportunity modeling. This map combines predicted fireline intensity (flame length) and the rate of fire spread data, providing a more detailed and comprehensive view of potential

safety concerns, problem fire hazard areas, and access issues. This tool can be useful to first responders to identify and address area-specific levels of suppression difficulty prior to an emergency. It can also be used by property owners to identify areas where actionable items can be targeted for home hardening/defensible space work and/or targeted hazardous fuels reduction work.

Areas in green are where wildfires are likely to be contained, with areas in red indicating areas of increased suppression difficulty. Areas that present themselves as red early in the season will be of concern throughout the entire season. These areas are a focus for hazard fuels mitigation work as they increase wildfire risk for a longer period of time.

Areas in gray are where: 1) structures are present in a dense enough fashion that no burnable fuel model could be assigned, or 2) areas that will not burn, e.g., irrigated fields, pavement, etc. *Recent fire events across California have shown that areas within the gray can still burn*; the closer to the wildland urban interface, the more vigilance is recommended.

No fire department can be expected to prevent all structural losses in a Wildland Urban Interface (WUI) setting. The potential for a wildfire to outpace suppression efforts means that all property owners in WUI areas accept a high degree of risk as well as responsibility.

Figure PA6.3. *Burn Probability - Early Fire Season*

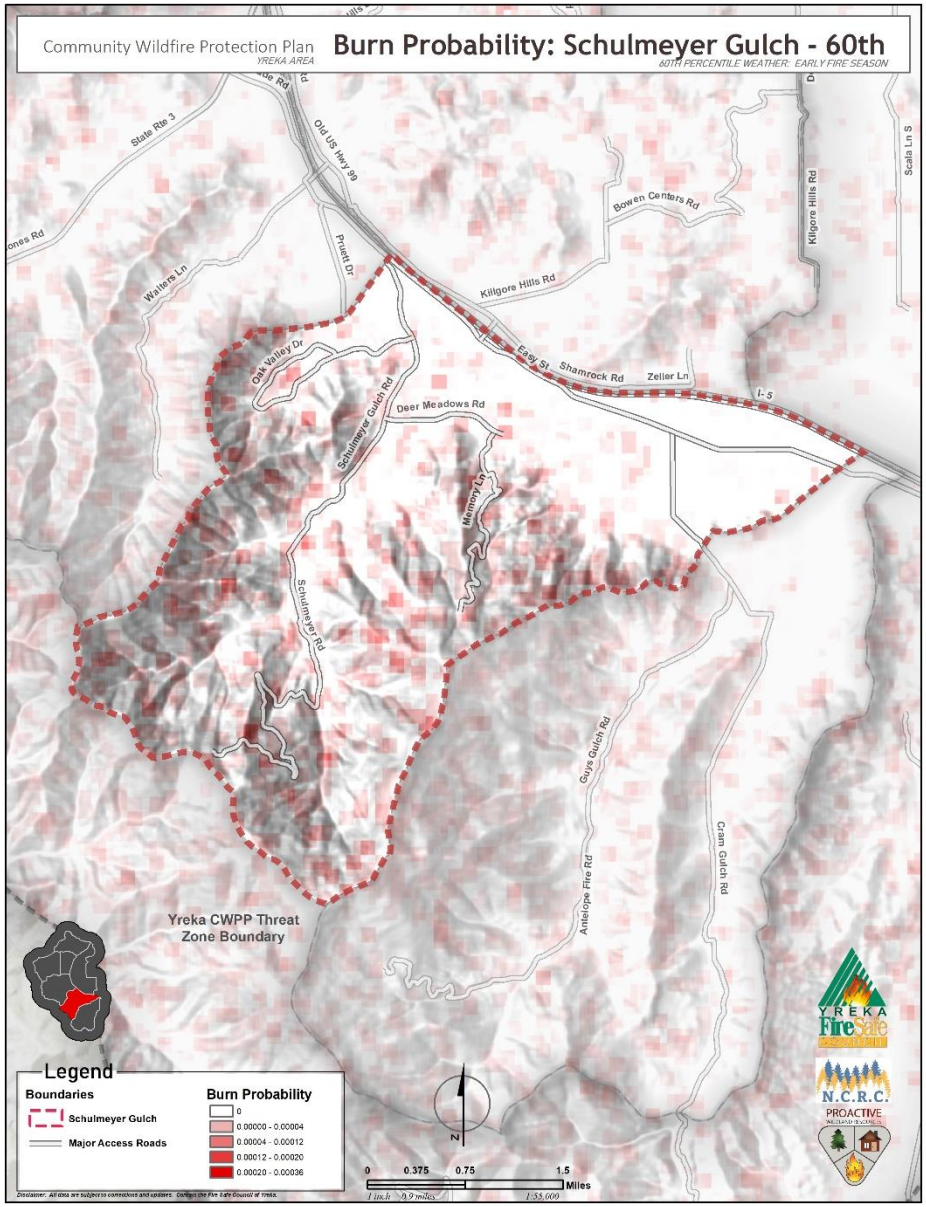
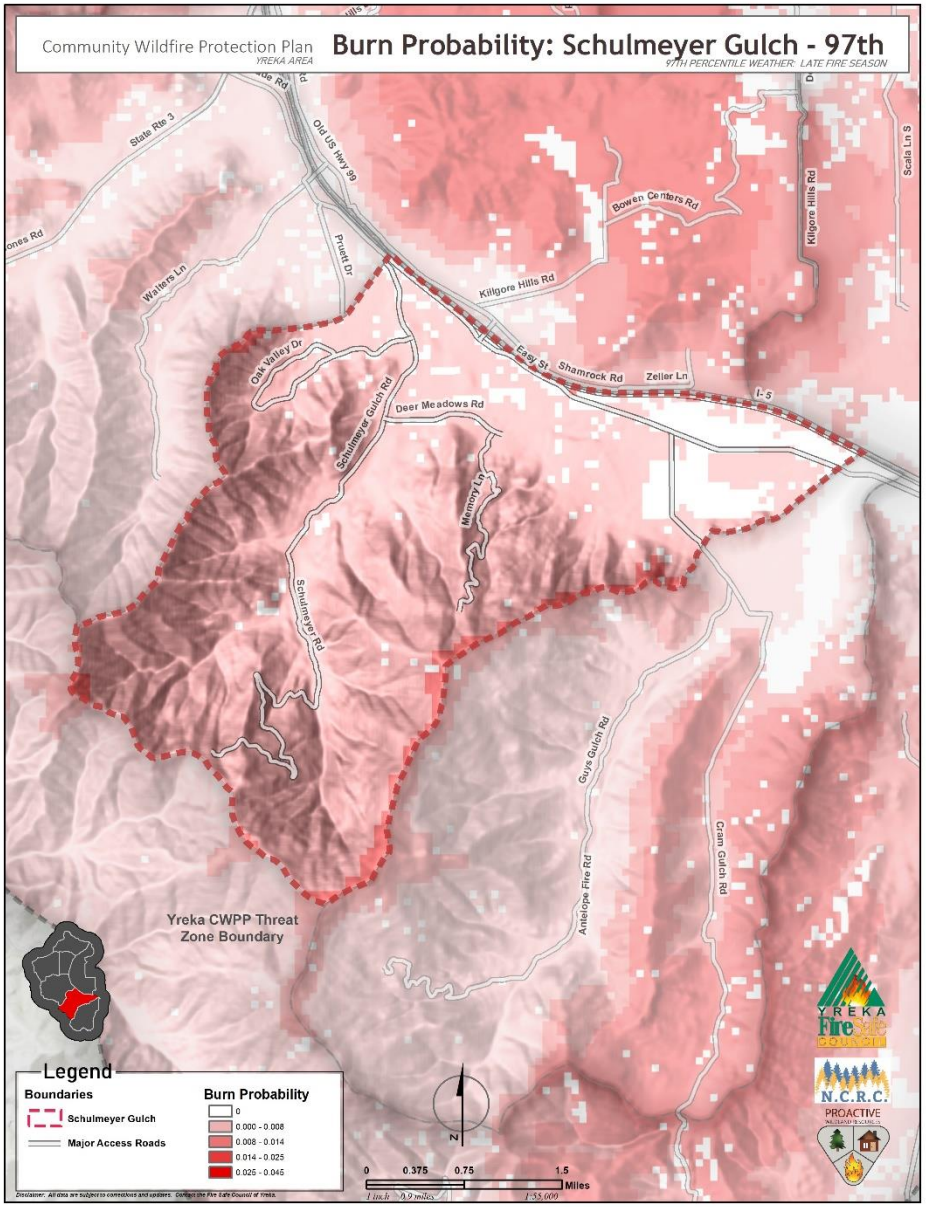


Figure PA6.4. *Burn Probability* **-** *Late Fire Season*



Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season		
Size Class in Acres	**Class A: 0 to .25**	**Class B: .25 to 10**	**Class C: 10 t0 100**	**Class D: 100 to 300**	**Class E: 300 to 1K**	**Class F: 1K to 5K**	**Class G: 5K +plus**	**Total**
# of Fires / % Fires		678 / 96%	26 / 4%					704 / 100%
# of Fires / % Fires			6 / 0.4%	5 / 0.3%	593 / 36.9%	1,004 / 62.4%		1,608 / 100%

Figure PA6.5. *Suppression Opportunity - Early Fire Season*

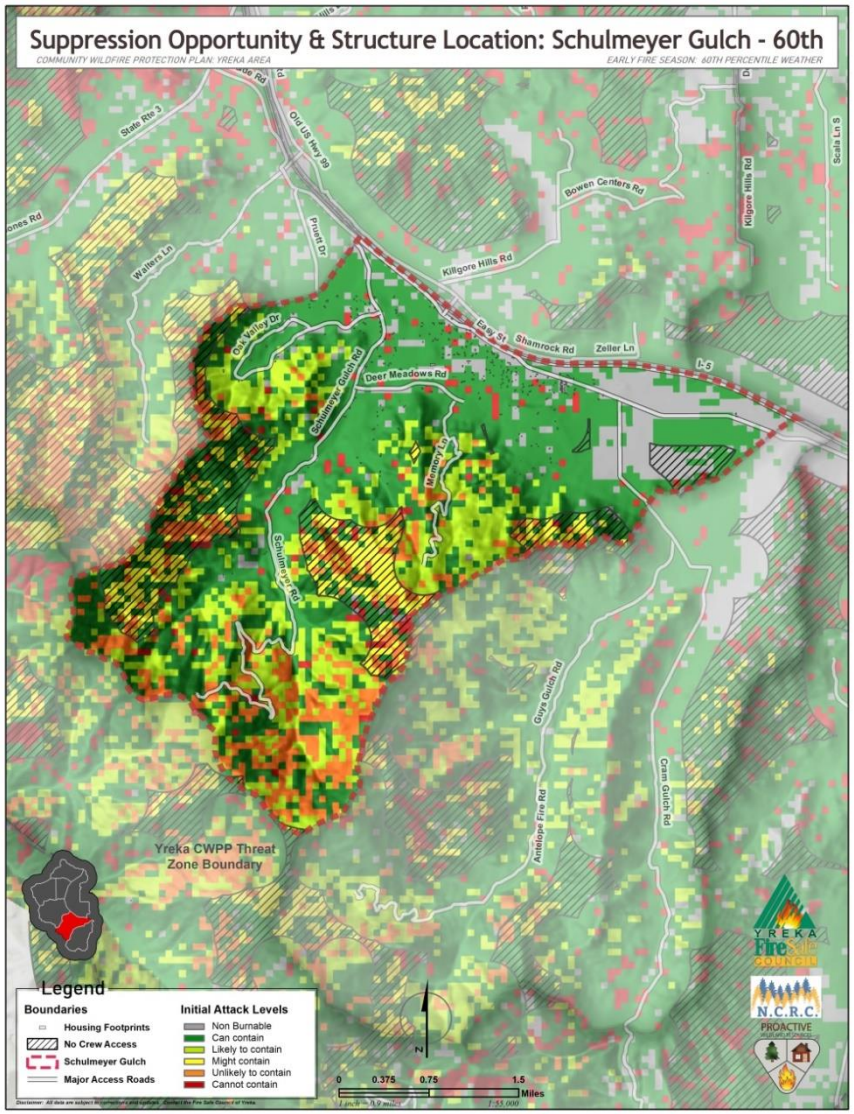
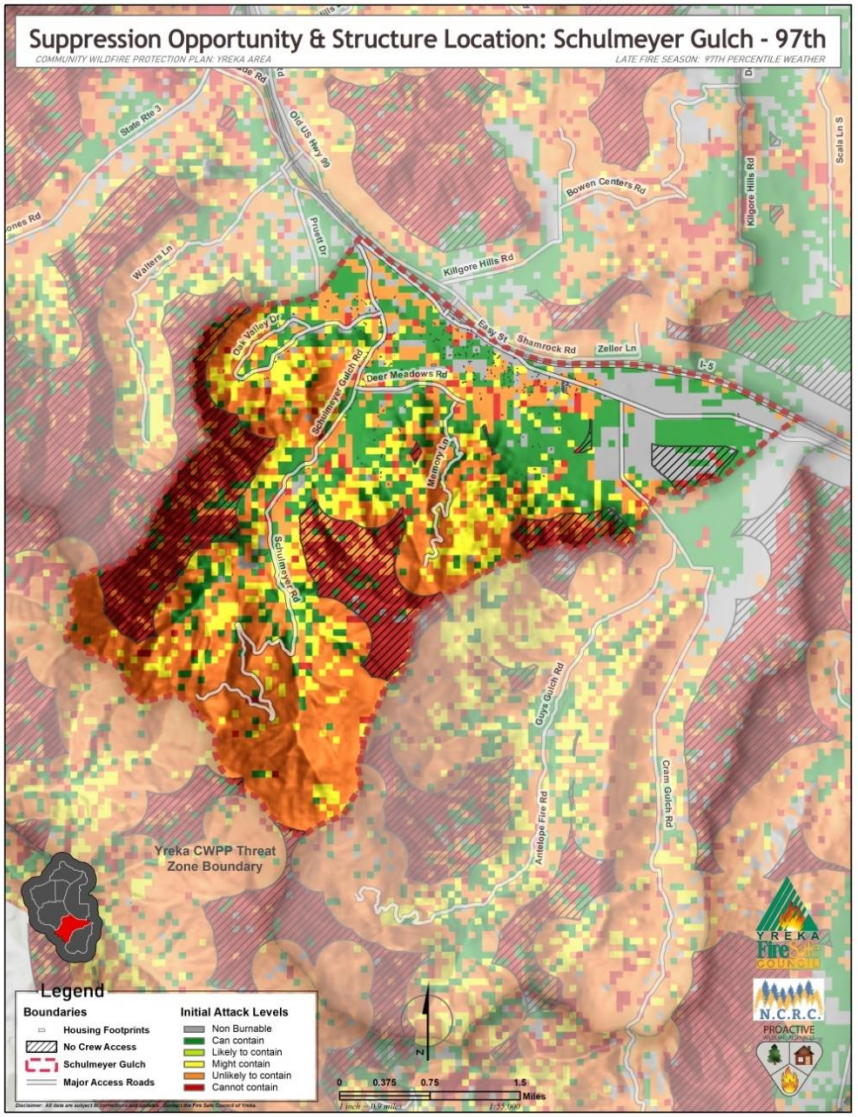


Figure PA6.6. *Suppression Opportunity - Late Fire Season*



Note: The darker the color, the higher flame length/fire intensity.

Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season	
	Not Modeled	Can Contain	Likely to Contain	Might Contain	Not Likely to Contain	Cannot Contain	Total
# Acres / % Acres	832 / 10.1%	4,294 / 51.9%	1,472 / 17.8%	482 / 5.8%	966 / 11.7%	223 / 2.7%	8,270 / 100%
No. of Structures	117	359	14	0	0	21	511
# Acres / % Acres	832 / 10.1%	1,862 / 22.5%	0 / 0%	1,111 / 13.4%	3,318 / 40.1%	1,147 / 13.4%	8,270 / 100%
No. of Structures	117	176	0	81	116	21	511

Outcomes/Results

The above analyses provided outputs that were further used to conduct a proximity analysis of structures within 180 feet of IASO map areas with extremely high resistance to control. The results of this work are found in Figures PA 1.7 and 1.8. These tools are for utilization by property owners and local agencies in continued dialogue about where work should be focused, with a goal of potentially accelerating hazard fuel reduction activities within the PA. An annual review of the following items is recommended: 1) local initiatives for fuel treatment, 2) annual actions to protect residential homes and neighborhoods by creating defensible space, and 3) changes such as fires or other actions that may have modified onsite fuels since the prior review.

1. Structures Potentially at Risk

Figure PA6.7 was developed by creating Zones of Concern that extend 300 feet beyond identified structures.

- Red Polygons: Areas within the red polygons are zones that are at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in modeled "Not-Likely-to-Contain" and "Cannot Contain" areas.
- Orange Polygons: These are areas identified that will become more at risk later in the summer and into the fall before the first rains.

Property owners should perform all of their structure hardening and defensible space work as identified in *Section 6* and *Appendix A*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.

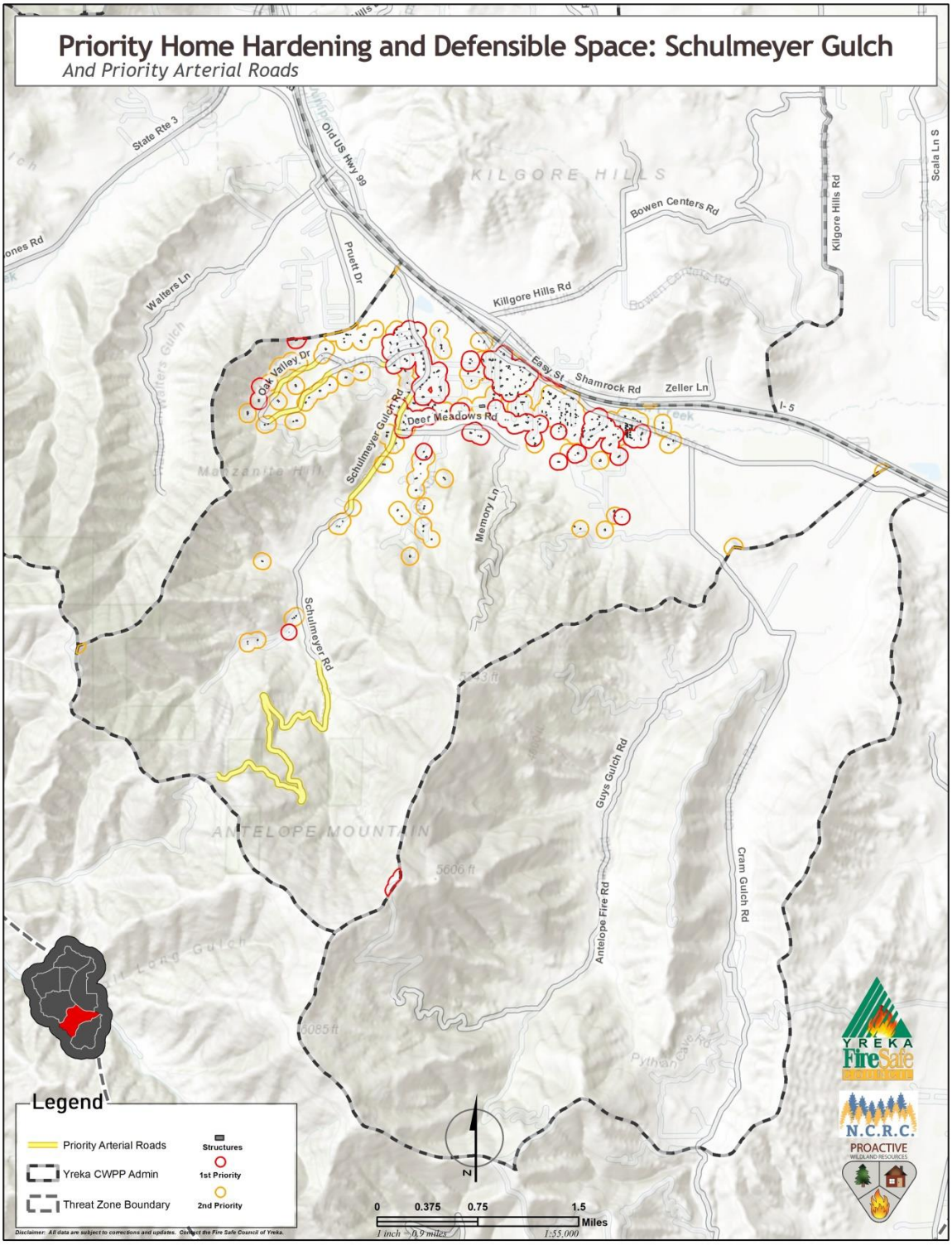
Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

2. Priority Areas/Roads for Hazardous Fuels Mitigation

Figure PA6.8 was developed by overlaying the Burn Probability analysis and Initial Attack Suppression Modeling outputs and suggests the following key priorities for treatments:

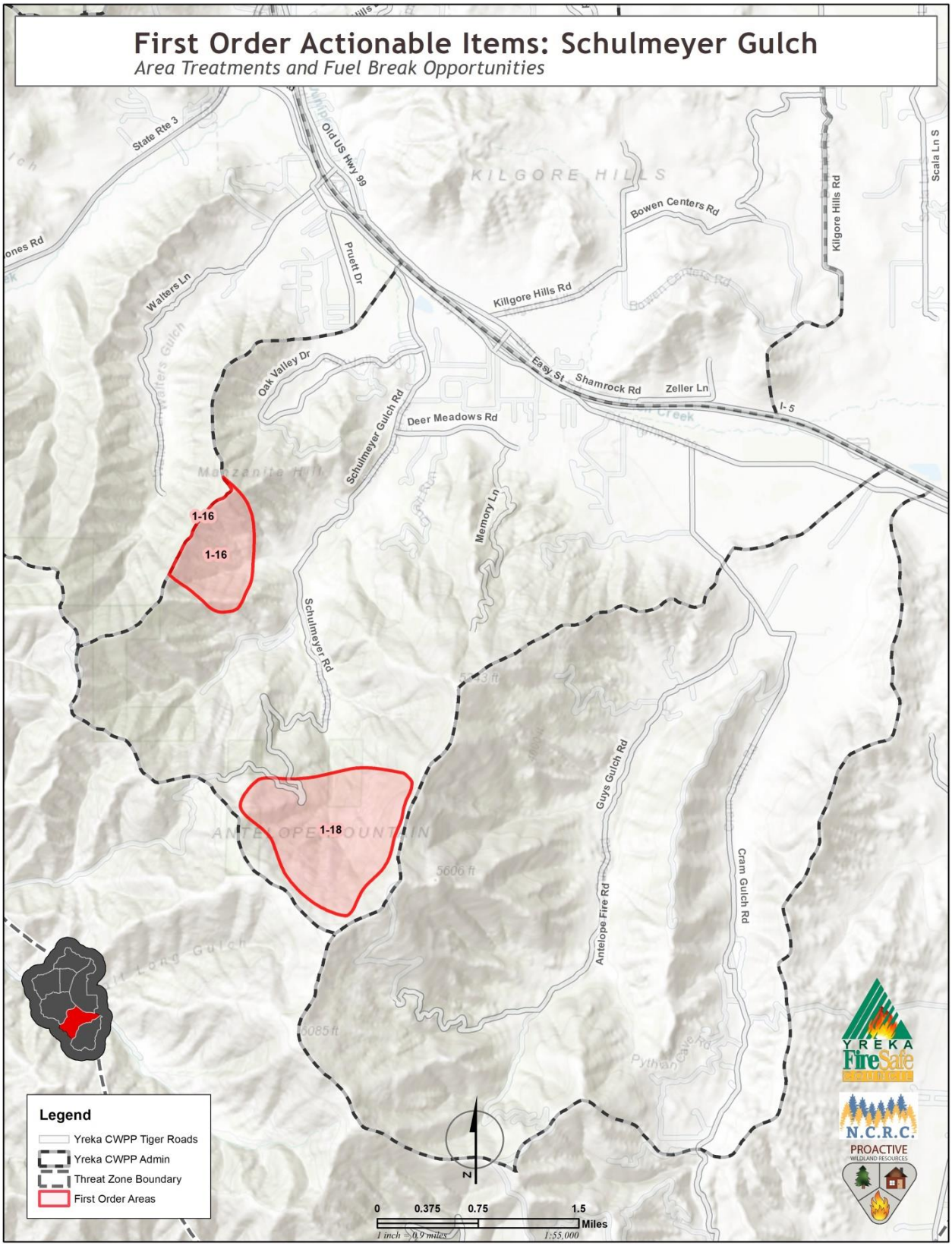
1. Roads/Infrastructure (areas detailed in Figure PA5.7)
2. Areas where structures are highlighted by red polygons
3. The Ridge between Walters Gulch and Schulmeyer Gulch
4. Between Schulmeyer Road and Memory Lane
5. Antelope Mountain Communications Site

Figure PA6.7. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Structures Potentially at Risk		
	Late Season Only	**Early and Late Season**
No. of Structures	196	180

Figure PA6.8. *Priority Areas for Hazardous Fuels Mitigation*



Wildfire Protection Resources

CAL FIRE has wildland fire responsibility for Schulmeyer Gulch. The South Yreka Fire Protection District has structure protection responsibility. Most fires in the area will generate a mutual aid response from the Yreka Fire Department, the Grenada Fire Protection District and the Montague Fire Department. They will work in partnership with CAL FIRE.

This plan is not intended to modify the provisions of any other agreements which a participating entity may have entered or may enter in the future.

It is the goal of the Agencies to this Agreement to achieve common standards within each agencies' best interest, recognizing differing agency missions and mandates. Each agency to this plan recognizes that other agency standards are reasonable, prudent, and acceptable. This clause is not intended to affect the jurisdictional agency's land management standards.

Primary concerns and challenges faced by protection forces

#1 = Access-ingress/egress are among the highest priority safety elements in a wildfire emergency.

- ✓ 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

Contact information for local fire protection services

State Resources (CAL FIRE)

- **CAL FIRE Yreka Station**
  1809 Fairlane Rd, Yreka, CA 96097 | (530) 842-4359
- **CAL FIRE Hornbrook Station**
  14638 Bradley Henley Rd, Hornbrook, CA 96044 | (530) 475-3582

Local Community & Volunteer Resources

- **Yreka Fire Department**
  401 W. Miner St, Yreka, CA 96097 | (530) 841-2383
- **South Yreka Fire Protection District**
  3420 Easy St. Yreka, CA 96097 | (530) 842-1477

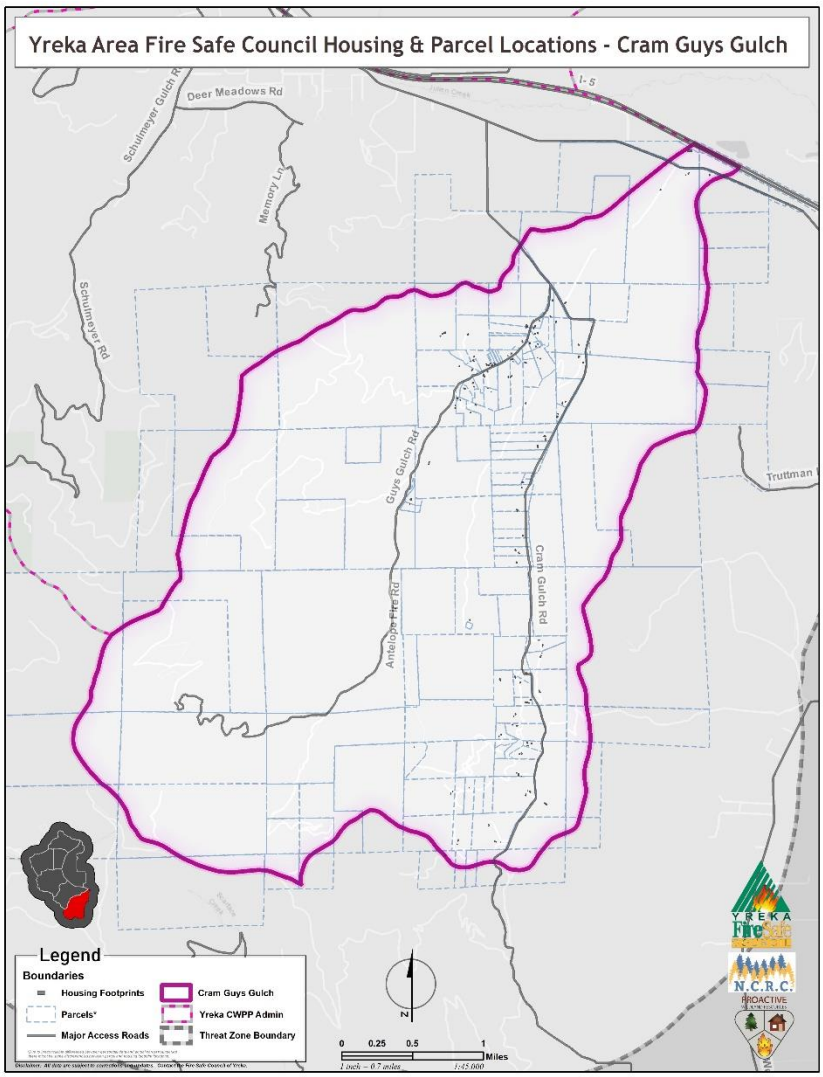
- **Grenada Fire Protection District**
  6055 4th Ave, Grenada, CA 96038 | (530) 436-2200
- **Montague Fire Department**
  121 South 10th St, Montague, CA 96064 | (530) 459-5343

7. Cram Gulch and Guys Gulch

General Overview/Description

The Cram and Guys Gulch PA lies to the south of the Schulmeyer Gulch PA. It is southern-most PA in the Yreka Area Fire Safe Council area. It is about 8,644 acres in size. There are 511 homes or other structures larger than homes. The majority of the residents are concentrated along both Guys Gulch and Cram Gulch Roads. The ridge that divides Schulmeyer Gulch and Guys Gulch is the dominant feature. The highest point is Antelope Mountain the southern tip of the ridge at an elevation of about 6,100 feet ASL. The lowest point is where Guys Gulch and Cram Gulch flow under the I-5 bridge in the north at an elevation of 2,660 feet.

Figure PA7.1. *Map of Cram and Guys Gulch Planning Area*



Wildland Fire Environment

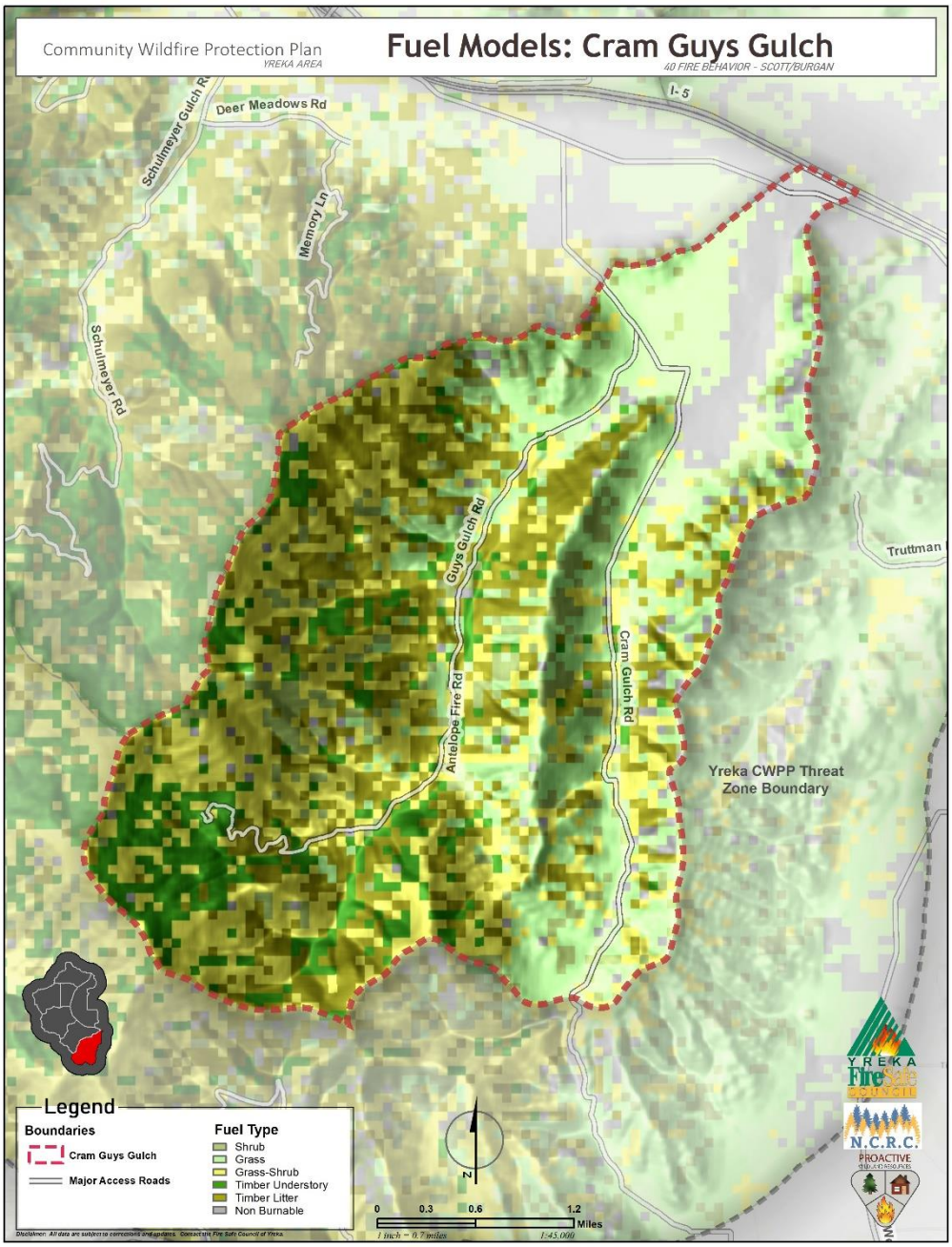
60% of the PA is covered in grass, grass/shrub and/or shrub, with forested fuels comprising about 32% of the area (Figure PA7.2, Fuel Models). Grass/shrub fuel types are subject to very rapid spread rates during hot, dry summer months which makes this PA especially vulnerable as the fire season progresses through summer and into fall. Forested area tend to burn slower and can have a greater intensity and increased resistance to control. This PA has perhaps the greatest concentration of high burn probabilities (Figures PA7.3 and PA7.4, Burn Probability). This is partially due to the grass/brush combinations of fuels coupled with a more flammable forested configuration.

Early fire season fuel conditions and weather conditions present a scenario where only 9% of the modeled fire starts become problematic. As the season progresses, the increase in resistance to control increases a startling 66% of late fire season starts becoming troublesome to suppress (Figures PA7.5 and PA7.6). The proximity of these areas to zones of population deserves attention as the fire season progress. The absence of large Class G fires also speaks to the slower spread rates of the forested fuels.

Wind-driven wildfires are the most significant.

Key risks of fire starts include the inhabited areas of Guys Gulch and Cram Gulch roads. There is little recreational use in the area. Summer lightning storms also present a high fire-start risk.

Figure PA7.2. *Fuel Models*



Acres/% Acres of Primary Fuel Types - Cram Guys Gulch		
	Acres	% Acres
Grass	2,216	25.6%
Grass/Shrub	2,304	26.7%
Shrub	737	8.5%
Timber Litter	1,860	21.5%
Timber Understory	918	10.6%
Slash/Blowdown	0	0
Not Modeled	609	7.0%
Total	**8,644**	**100%**

Analysis of Expected Fire Behavior

Wildfires respond to weather, fuels (vegetation), and topography. Wind - primarily due to downdrafts from lightning storms or strong prevailing winds - is the most critical weather factor influencing fire behavior. Fuels are typically lighter and fires can be more easily suppressed especially in the lower and mid-slope areas of this PA earlier in the fire season. As the fire season progresses, wildfires become more problematic as summer temperatures increase and fuel moistures decrease.

Figures PA7.3, PA7.4, PA7.5 and PA7.6 and their data tables are unique to this PA and were derived from flame length and rate of spread analyses and for two distinct (early and late) fire season situations (see *Section 5* for a methodology overview and definitions).

The outcomes were considered for two distinct but equally important fire characteristics:

1. Burn Probability

Figures PA7.3 and PA7.4 illustrate Burn Probability, providing an assessment of what areas and which types of fuels are likely to burn provided an ignition. The darker red a shaded area is, the more likely it is to burn. This is important information to determine where hazardous fuel mitigation may need to be focused.

One of the outputs from the Burn Probability modeling is the size of the modeled fires after two burning periods. This knowledge aids in understanding how fires want to burn and to what extent they might burn. There were 1,525 late fire season fires modeled for this PA.

- **Early Fire Season (60th percentile weather)**
  The largest fire modeled during early fire season simulations was 20 acres. The average fire size was 8.2 acres.
- **Late Fire Season (97th percentile weather)**
  The largest fire modeled during late summer burned 6,108 acres. The largest area burned within the PA was 3,751 acres. Average acres for the simulation 2,512 and average acres within the PA 973 acres burned.

Wildfires burn across PA boundaries and simply expand in size and scope wherever burnable material exists. A fire that starts close to one PA boundary may predominantly burn into an adjoining area. When referring below to the "largest" fire burned, this is the total size across all PA boundaries. When "within" the PA, this is the total acres burned within the PA boundary.

2. Initial Attack Suppression Opportunity

Figures PA7.5 and PA7.6 display the outputs from the Initial Attack Suppression Opportunity modeling. This map combines predicted fireline intensity (flame length) and the rate of fire spread data, providing a more detailed and comprehensive view of potential safety concerns, problem fire hazard areas, and access issues. This tool can be useful to first responders to identify and address area-specific levels of suppression difficulty prior to an emergency. It can

also be used by property owners to identify areas where actionable items can be targeted for home hardening/defensible space work and/or targeted hazardous fuels reduction work.

Areas in green are where wildfires are likely to be contained, with areas in red indicating areas of increased suppression difficulty. Areas that present themselves as red early in the season will be of concern throughout the entire season. These areas are a focus for hazard fuels mitigation work as they increase wildfire risk for a longer period of time.

Areas in gray are where: 1) structures are present in a dense enough fashion that no burnable fuel model could be assigned, or 2) areas that will not burn, e.g., irrigated fields, pavement, etc. *Recent fire events across California have shown that areas within the gray can still burn*; the closer to the wildland urban interface, the more vigilance is recommended.

No fire department can be expected to prevent all structural losses in a Wildland Urban Interface (WUI) setting. The potential for a wildfire to outpace suppression efforts means that all property owners in WUI areas accept a high degree of risk as well as responsibility.

Figure PA7.3. *Burn Probability - Early Fire Season*

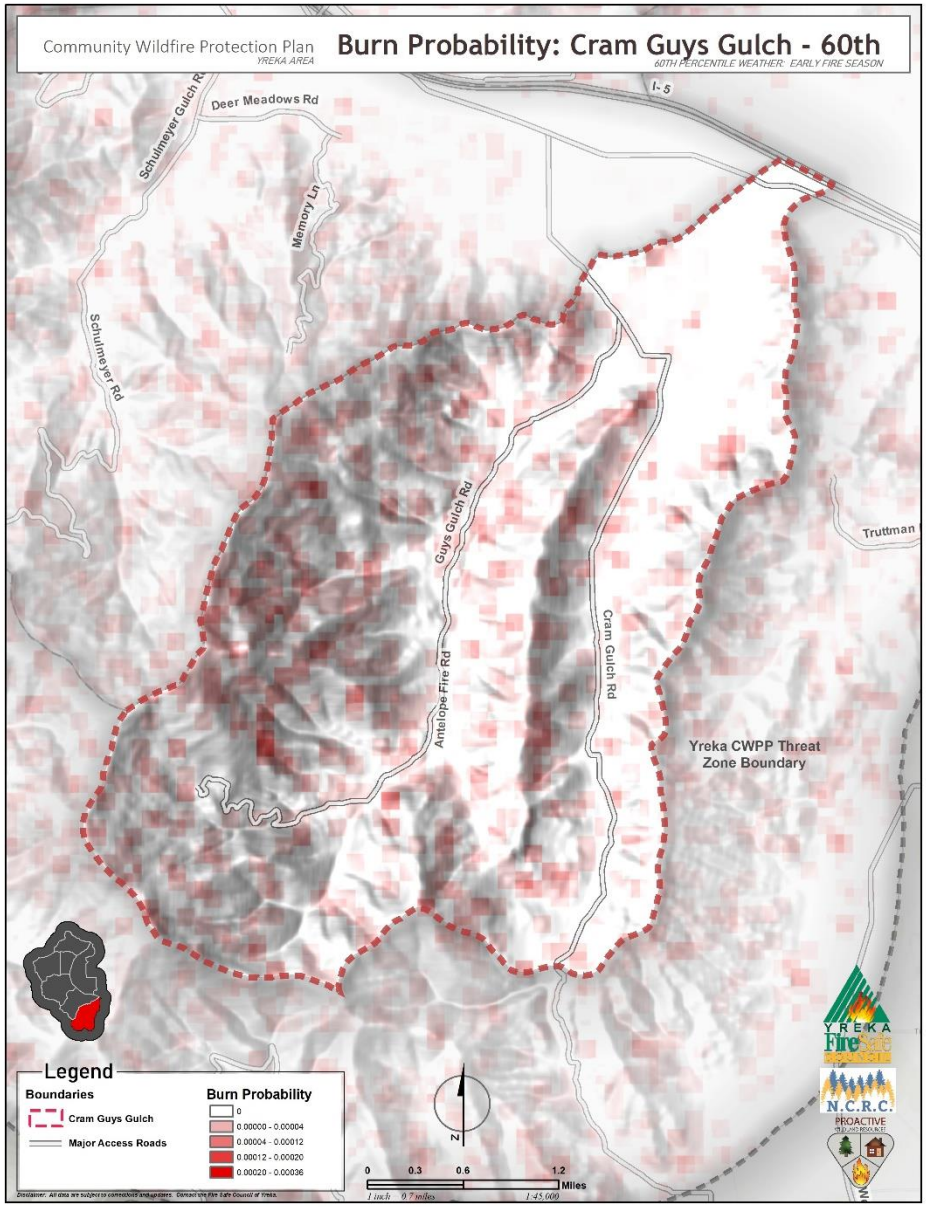
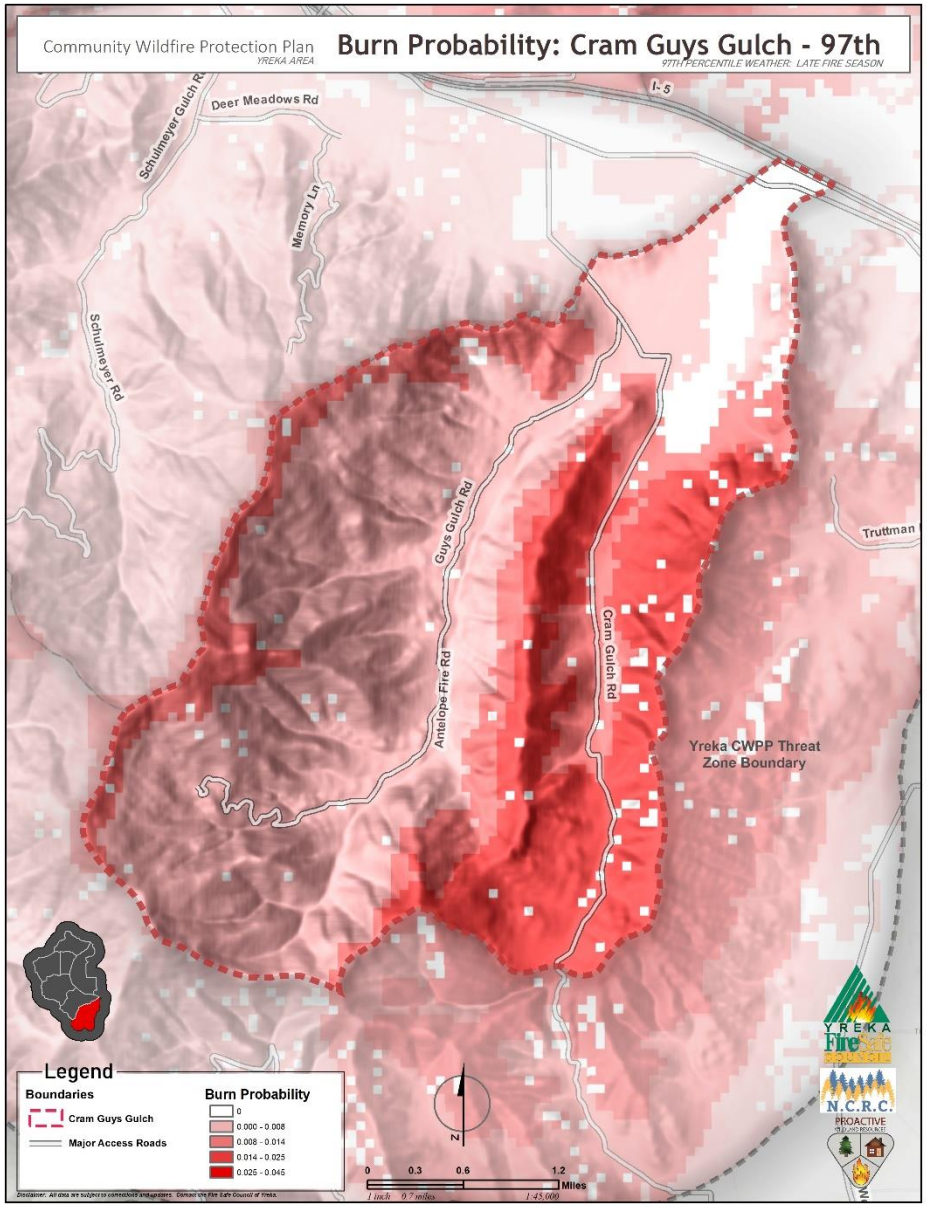


Figure PA7.4. *Burn Probability - Late Fire Season*



Number of Modeled Fires by Fire Size Class					Early Fire Season		Late Fire Season	
Size Class in Acres	**Class A: 0 to .25**	**Class B: .25 to 10**	**Class C: 10 t0 100**	**Class D: 100 to 300**	**Class E: 300 to 1K**	**Class F: 1K to 5K**	**Class G: 5K +plus**	**Total**
# of Fires / % Fires		644 / 94%	40 / 6%					684 / 100%
# of Fires / % Fires			3 / 0.2%		307 / 20.1%	1,154 / 75.7%	61 / 4.0%	1,525 / 100%

Figure PA7.5. *Suppression Opportunity - Early Fire Season*

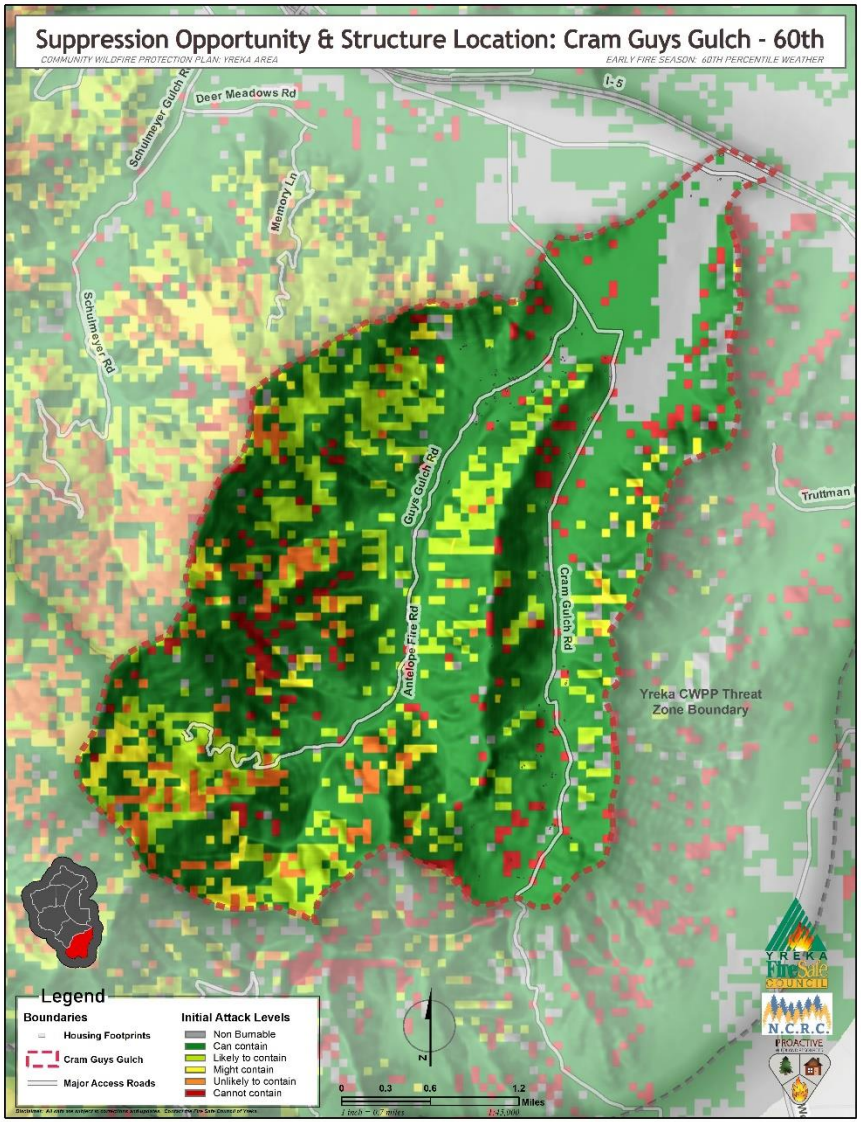
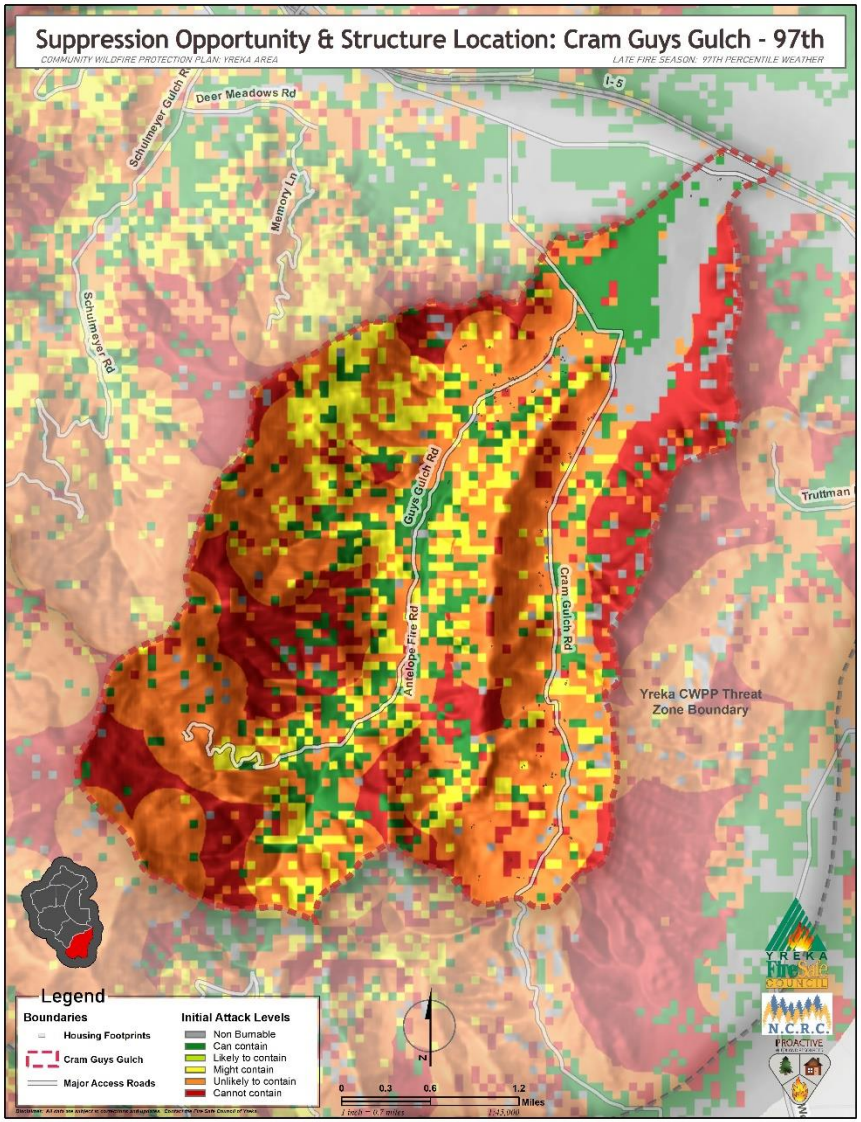


Figure PA7.6. *Suppression Opportunity - Late Fire Season*



Note: The darker the color, the higher flame length/fire intensity.

Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season	
	Not Modeled	Can Contain	Likely to Contain	Might Contain	Not Likely to Contain	Cannot Contain	Total
# Acres / % Acres	609/ 7.0%	5,775 / 66.8%	1,167 / 13.5%	319 / 3.7%	366 / 4.2%	408 / 4.7%	8,644 / 100%
No. of Structures	12	147	5	0	0	18	182
# Acres / % Acres	609 / 7.0%%	1,274 / 14.7%	0 / 0%	1,061 / 12.3%	3,987 / 46.1%	1,713 / 19.8%	8,644 / 100%
No. of Structures	12	18	0	14	120	18	182

Outcomes/Results

The above analyses provided outputs that were further used to conduct a proximity analysis of structures within 180 feet of IASO map areas with extremely high resistance to control. The results of this work are found in Figures PA 1.7 and 1.8. These tools are for utilization by property owners and local agencies in continued dialogue about where work should be focused, with a goal of potentially accelerating hazard fuel reduction activities within the PA. An annual review of the following items is recommended: 1) local initiatives for fuel treatment, 2) annual actions to protect residential homes and neighborhoods by creating defensible space, and 3) changes such as fires or other actions that may have modified onsite fuels since the prior review.

1. Structures Potentially at Risk

Figure PA7.7 was developed by creating Zones of Concern that extend 300 feet beyond identified structures.

- Red Polygons: Areas within the red polygons are zones that are at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in modeled "Not-Likely-to-Contain" and "Cannot Contain" areas.
- Orange Polygons: These are areas identified that will become more at risk later in the summer and into the fall before the first rains.

Property owners should perform all of their structure hardening and defensible space work as identified in *Section 6* and *Appendix A*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.

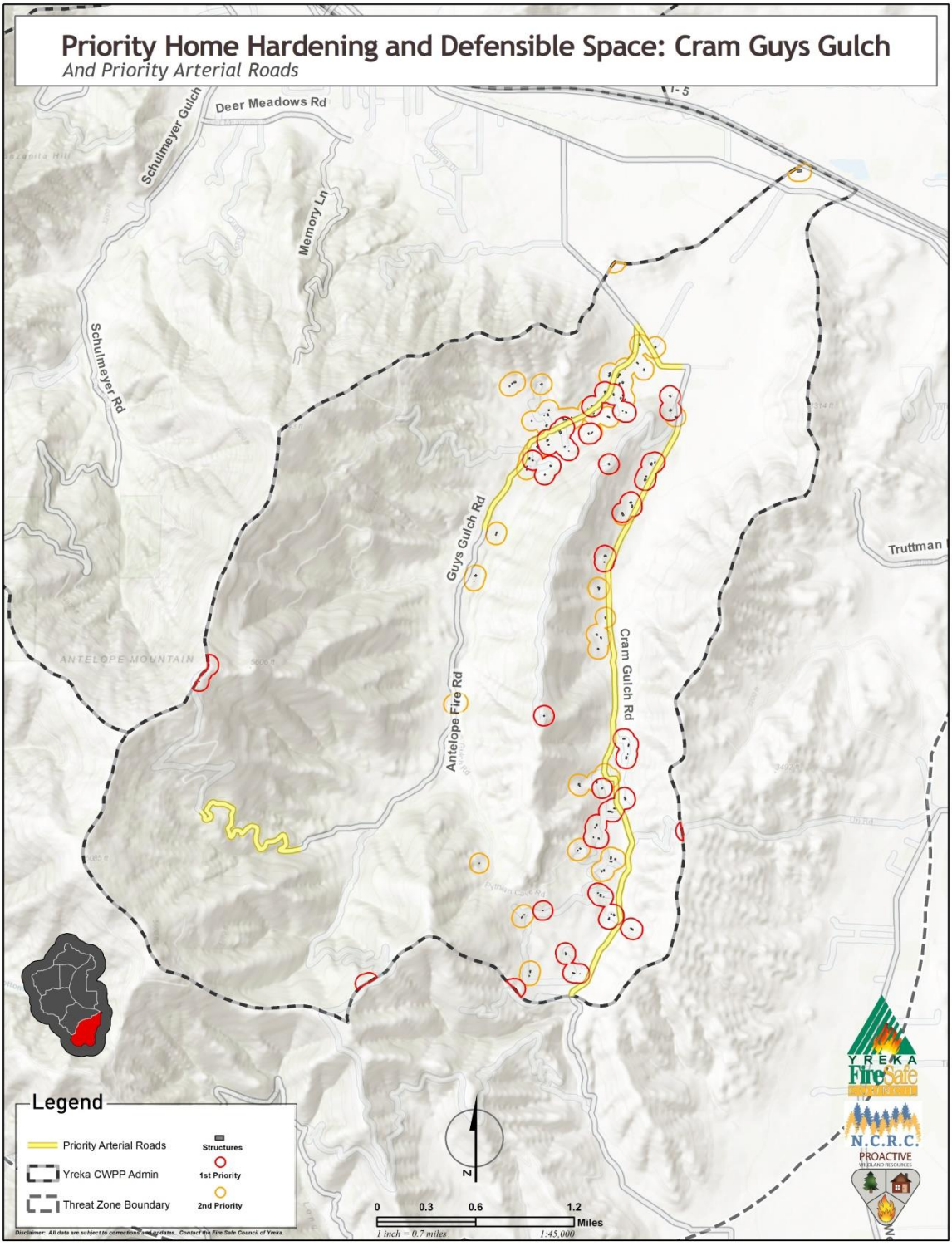
Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

2. Priority Areas/Roads for Hazardous Fuels Mitigation

Figure PA7.8 was developed by overlaying the Burn Probability analysis and Initial Attack Suppression Modeling outputs and suggests the following key priorities for treatments:

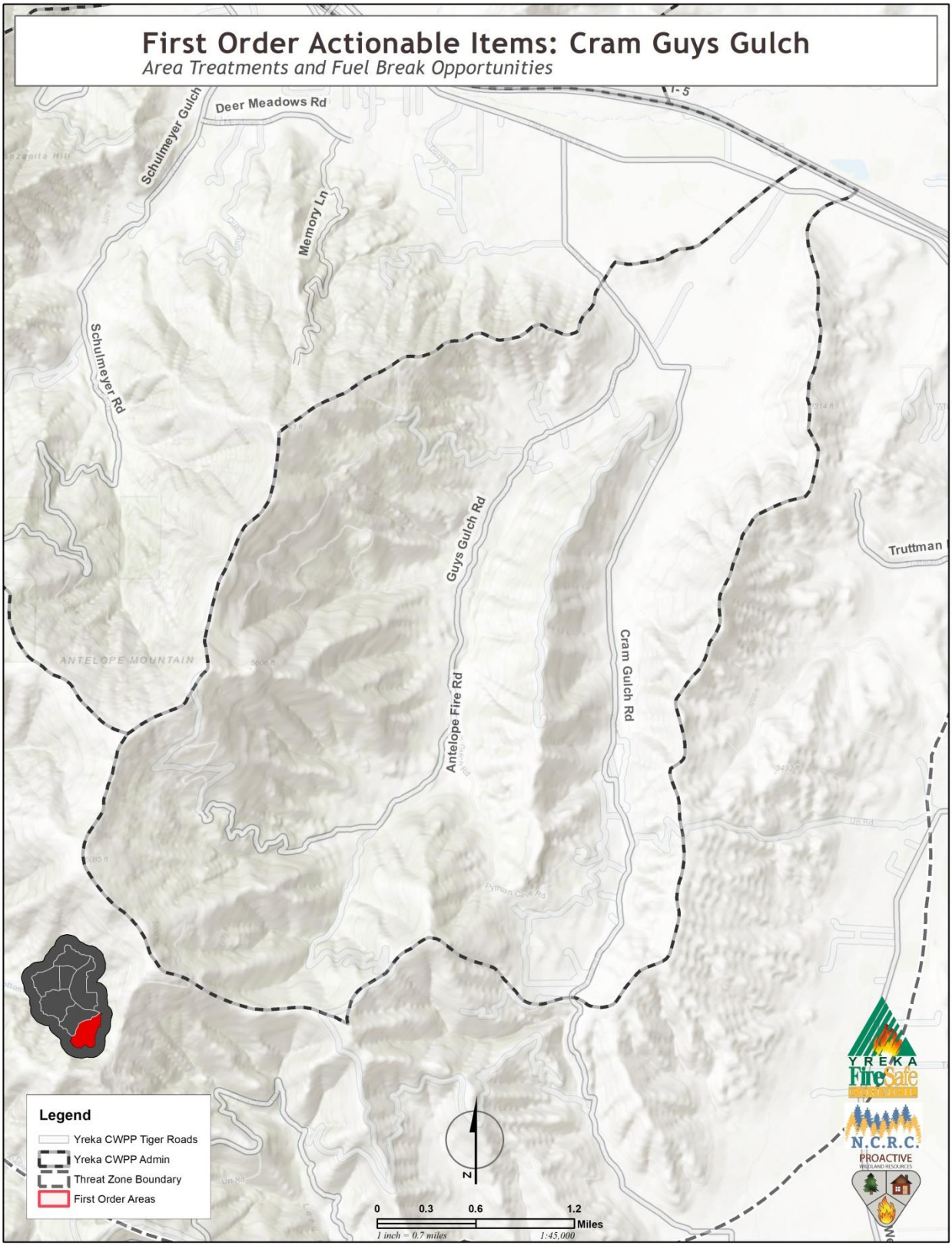
1. Roads/Infrastructure (areas detailed in Figure PA7.7)
2. Areas where structures are highlighted by red polygons
3. The Antelope Mountain Communications Site
4. Cram Gulch Road

Figure PA7.7. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Structures Potentially at Risk		
	Late Season Only	**Early and Late Season**
No. of Structures	58	81

Figure PA7.8. *Priority Areas for Hazardous Fuels Mitigation*



Wildfire Protection Resources

CAL FIRE has wildland fire responsibility for Guys and Cram Gulches. The South Yreka Fire Protection District will soon have structure protection responsibility. Most fires in the area will generate a mutual aid response from the Yreka Fire Department, the Grenada Fire Protection District and the Montague Fire Department. They will work in partnership with CAL FIRE.

This plan is not intended to modify the provisions of any other agreements which a participating entity may have entered or may enter in the future.

It is the goal of the Agencies to this Agreement to achieve common standards within each agencies' best interest, recognizing differing agency missions and mandates. Each agency to this plan recognizes that other agency standards are reasonable, prudent, and acceptable. This clause is not intended to affect the jurisdictional agency's land management standards.

Primary concerns and challenges faced by protection forces

#1 = Access-ingress/egress are among the highest priority safety elements in a wildfire emergency.

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- **Yreka Fire Department**
  401 W. Miner St, Yreka, CA 96097 | (530) 841-2383
- **South Yreka Fire Protection District**
  3420 Easy St. Yreka, CA 96097 | (530) 842-1477

- **Grenada Fire Protection District**
  6055 4th Ave, Grenada, CA 96038 | (530) 436-2200
- **Montague Fire Department**
  121 South 10th St, Montague, CA 96064 | (530) 459-5343

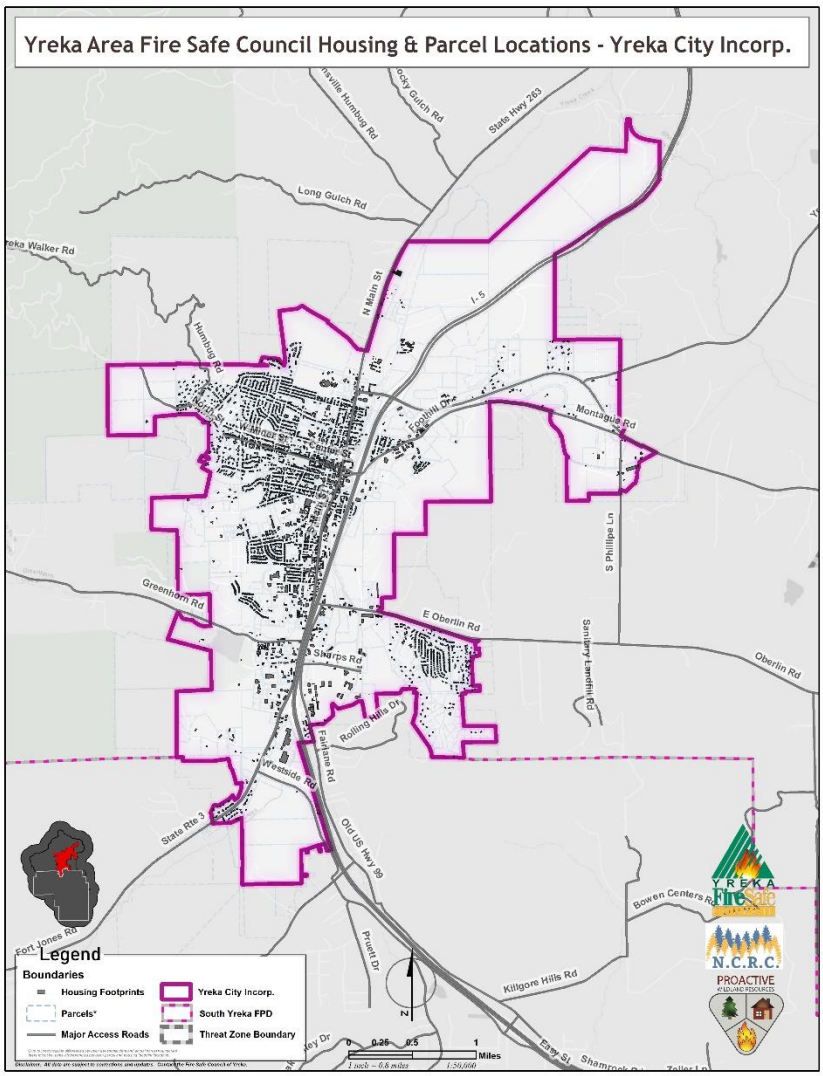
8. City of Yreka (Incorporated Area)

General Overview/Description

The City of Yreka PA is intended to provide a complete look at all of the analysis outcomes for city managers and the Yreka Fire Department. Yreka is the largest city in Siskiyou County with a populaton of 7,508. It is also the County seat. The vast majority of the structures within the incorporated area are in the central portion of the PA.

It is about 6,383 acres in size. There are approximately 3,655 structures that are homes, major structures or businesses.

Figure PA8.1. *Map of the City of Yreka Planning Area*



Wildland Fire Environment

Yreka has had several fires in the past that have threatened the city but have, as of yet, not impinged on city residents or businesses. The 64,000 plus acre Haystack burn in 1955 is the last large fire event that threatened the City. The 2016 Grade Fire and subsequent 2020 Badger Fire demonstrated the extreme volatility of the area and are reminders that fire continues to be a threat to the city. The Badger Fire burned 557 acres on Badger Mountain Road and Hawkinsville Humbug Road within sight of Yreka, prompting evacuation orders and warnings. The cause of this fire is still under investigation. On August 24, 2016, the Grade Fire ignited near Hawkinsville just two miles north of town. It started due to an insufficient residential electrical connection during an extreme north wind event. It burned 710 acres and destroyed five structures.

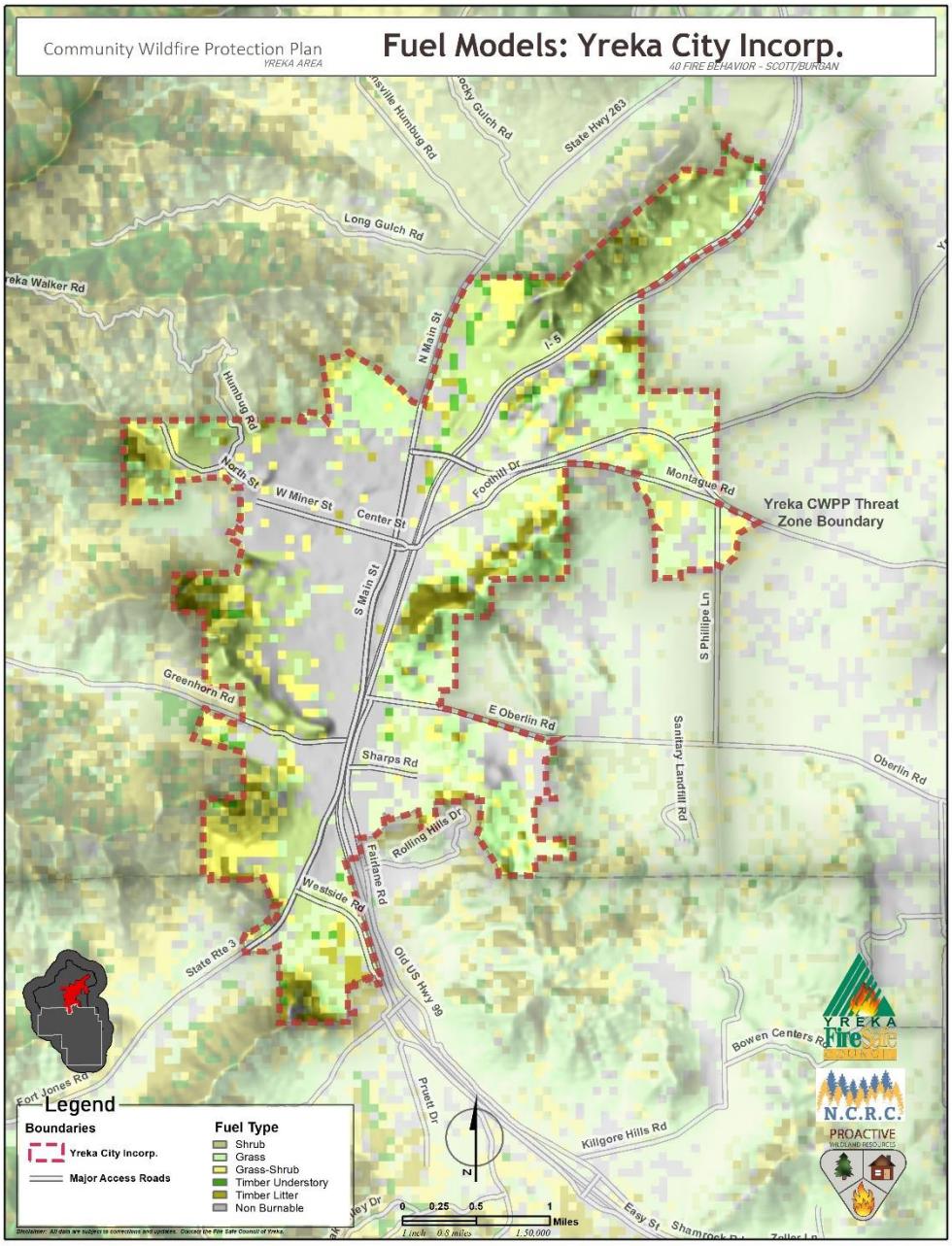
Over 60% of the PA is covered in grass, grass/shrub and/or shrub. These fuel types are subject to very rapid spread rates during hot, dry summer months, making this PA especially vulnerable as the fire season progresses through summer and into fall. Forested fuels comprise about 32% of the area. Forested areas tend to burn slower and can have a greater intensity and increased resistance to control. This PA has a high concentration of high burn probabilities along the eastern sections. This is partially due to the grass/brush combinations of fuels coupled with a more flammable forested configuration (Figures PA8.2 and PA8.3, Burn Probability).

Early fire season fuel conditions and weather conditions present a scenario where 25% of the modeled fire starts become problematic. That is worth considering as these areas will be the city throughout the fire season. As the season progresses, the increase in resistance to control becomes 55% of late fire season starts becoming troublesome to suppress (Figures PA8.4 and PA8.5, Suppression Opportunity). The proximity of these areas to zones of population deserves attention, as the fire season progress. The absence of large Class G fires also speaks to the slower spread rates of the forested fuels.

Wind-driven wildfires are the most significant weather concern and are further discussed in the Fire Behavior section below. Fire start concerns include the mobile transient population, errant careless acts such as cigarettes being discarded, debris burns being lighted during adverse weather conditions, etc. As fire seasons get longer and drier, the more susceptible the city is to fire starts.

Key risks of fire starts include the I-5 corridor, transient occupation along the Yreka Greenway and lightning storms.

Figure PA8.2. *Fuel Models*



Acres / % Acres of Primary Fuel Types – Yreka City		
	Acres	% Acres
Grass	1,461	22.9%
Grass/Shrub	765	12.0%
Shrub	1,661	26.0%
Timber Litter	331	5.2%
Timber Understory	96	1.5%
Not Modeled	2,069	32.4%
Total	**6,383**	**100%**

Analysis of Expected Fire Behavior

Wildfires respond to weather, fuels (vegetation), and topography. Wind - primarily due to downdrafts from lightning storms or strong prevailing winds - is the most critical weather factor influencing fire behavior. Fuels are typically lighter and fires can be more easily suppressed especially in the lower and mid-slope areas of this PA earlier in the fire season. As the fire season progresses, wildfires become more problematic as summer temperatures increase and fuel moistures decrease.

Figures PA8.3, PA8.4, PA8.5 and PA8.6 and their data tables are unique to this PA and were derived from flame length and rate of spread analyses and for two distinct (early and late) fire season situations (see *Section 5* for a methodology overview and definitions).

The outcomes were considered for two distinct but equally important fire characteristics:

1. Burn Probability

Figures PA8.3 and PA8.4 illustrate Burn Probability, providing an assessment of what areas and which types of fuels are likely to burn provided an ignition. The darker red a shaded area is, the more likely it is to burn. This is important information to determine where hazardous fuel mitigation may need to be focused.

One of the outputs from the Burn Probability modeling is the size of the modeled fires after two burning periods. This knowledge aids in understanding how fires want to burn and to what extent they might burn. Of the 25,000 fires modeled for the Late Fire Season scenario, 1,887 starts fell within the City of Yreka for the Late Fire Season scenario.

- **Early Fire Season (60th percentile weather)**
  The largest fire modeled during early summer simulations was 26 acres. The average fire size was 9 acres.

- **Late Fire Season (97th percentile weather)**
  The largest fire modeled during late summer burned 16,225 acres. The largest area burned within the PA was 3,793 acres. Average acres for the

Wildfires burn across PA boundaries and simply expand in size and scope wherever burnable material exists. A fire that starts close to one PA boundary may predominantly burn into an adjoining area. When referring below to the "largest" fire burned, this is the total size across all PA boundaries. When "within" the PA, this is the total acres burned within the PA boundary.

2. Initial Attack Suppression Opportunity

Figures PA8.5 and PA8.6 display the outputs from the Initial Attack Suppression Opportunity modeling. This map combines predicted fireline intensity (flame length) and the rate of fire spread data, providing a more detailed and comprehensive view of potential safety concerns, problem fire hazard areas, and access issues. This tool can be useful to first responders to

identify and address area-specific levels of suppression difficulty prior to an emergency. It can also be used by property owners to identify areas where actionable items can be targeted for home hardening/defensible space work and/or targeted hazardous fuels reduction work.

Areas in green are where wildfires are likely to be contained, with areas in red indicating areas of increased suppression difficulty. Areas that present themselves as red early in the season will be of concern throughout the entire season. These areas are a focus for hazard fuels mitigation work as they increase wildfire risk for a longer period of time.

Areas in gray are where: 1) structures are present in a dense enough fashion that no burnable fuel model could be assigned, or 2) areas that will not burn, e.g., irrigated fields, pavement, etc. *Recent fire events across California have shown that areas within the gray can still burn*; the closer to the wildland urban interface, the more vigilance is recommended.

No fire department can be expected to prevent all structural losses in a Wildland Urban Interface (WUI) setting. The potential for a wildfire to outpace suppression efforts means that all property owners in WUI areas accept a high degree of risk as well as responsibility.

Figure PA8.3. *Burn Probability - Early Fire Season*

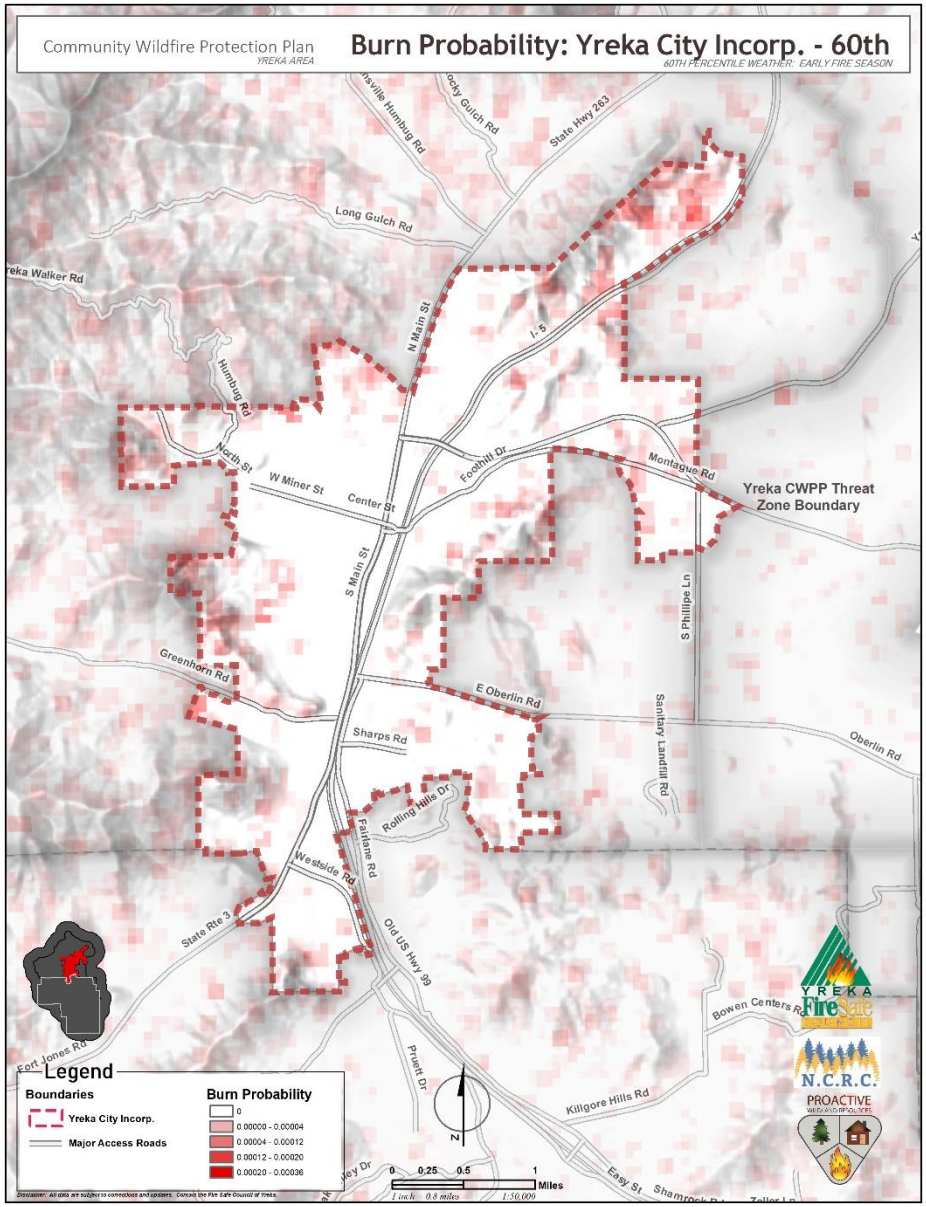
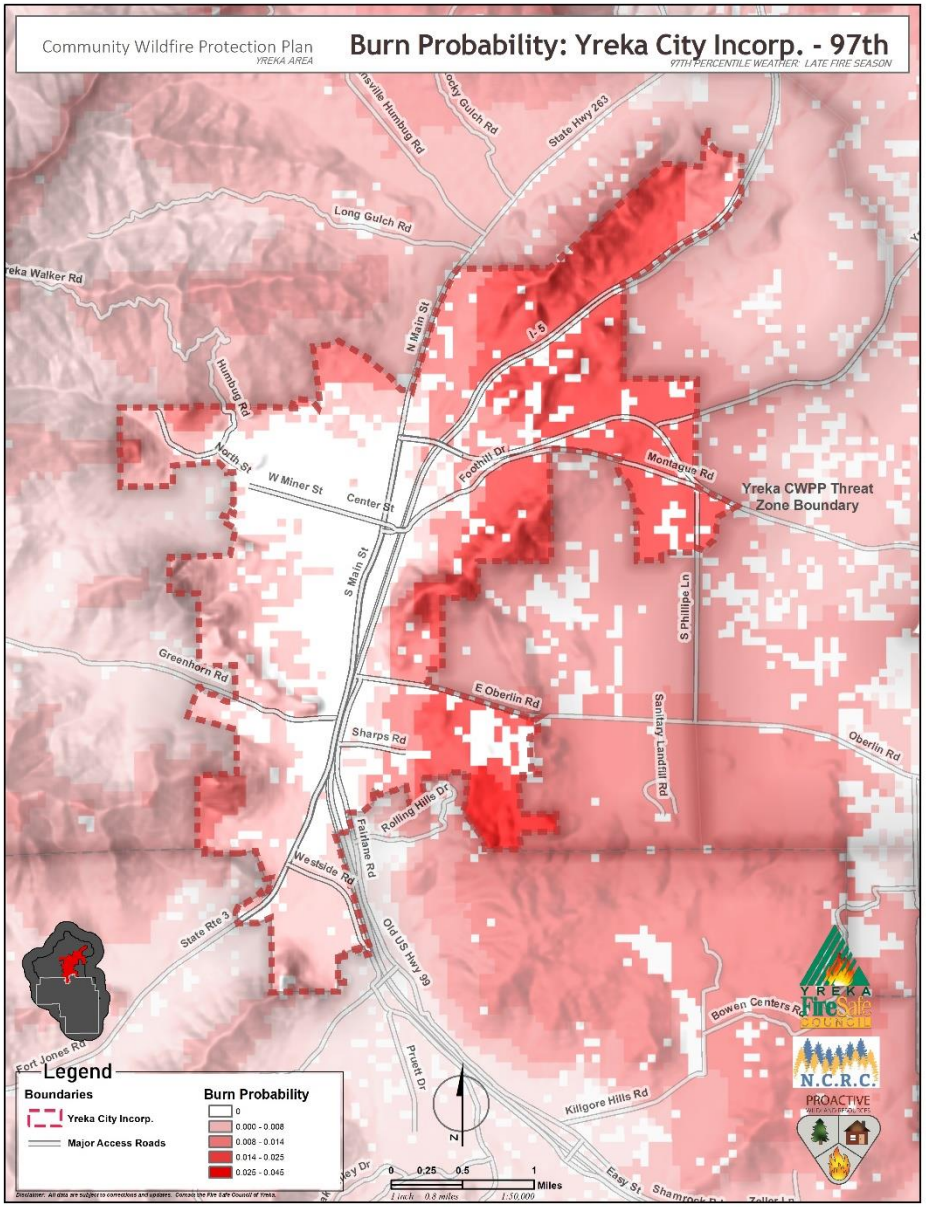


Figure PA8.4. *Burn Probability - Late Fire Season*



Number of Modeled Fires by Fire Size Class				Early Fire Season			Late Fire Season	
Size Class in Acres	**Class A: 0 to .25**	**Class B: .25 to 10**	**Class C: 10 t0 100**	**Class D: 100 to 300**	**Class E: 300 to 1K**	**Class F: 1K to 5K**	**Class G: 5K +plus**	**Total**
# of Fires / % Fires		304 / 68%	146 / 32%					450 / 100%
# of Fires / % Fires		9 / 0.2%	4 / 0.3%	0 / 0.9%%	29 / 23.3%	996 / 60.2%	849 / 15.5%	1,887 / 100%

Figure PA8.5. *Suppression Opportunity - Early Fire Season*

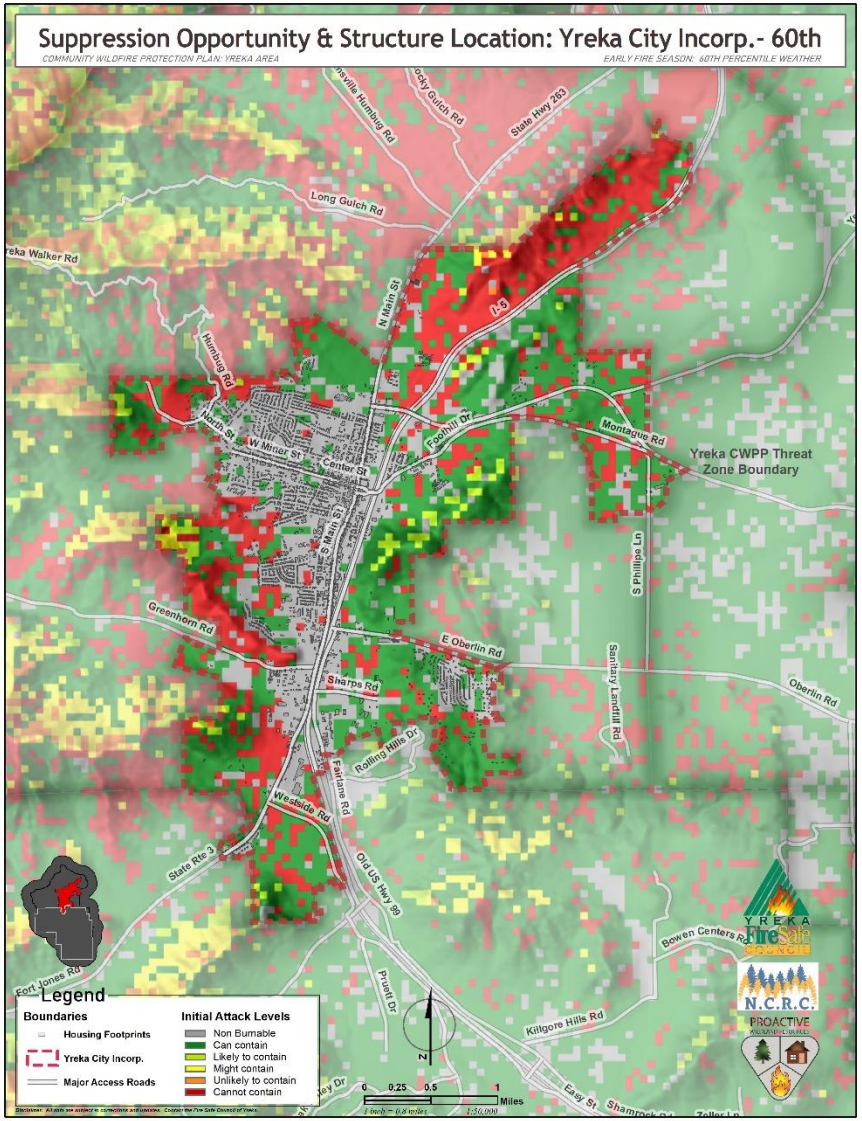
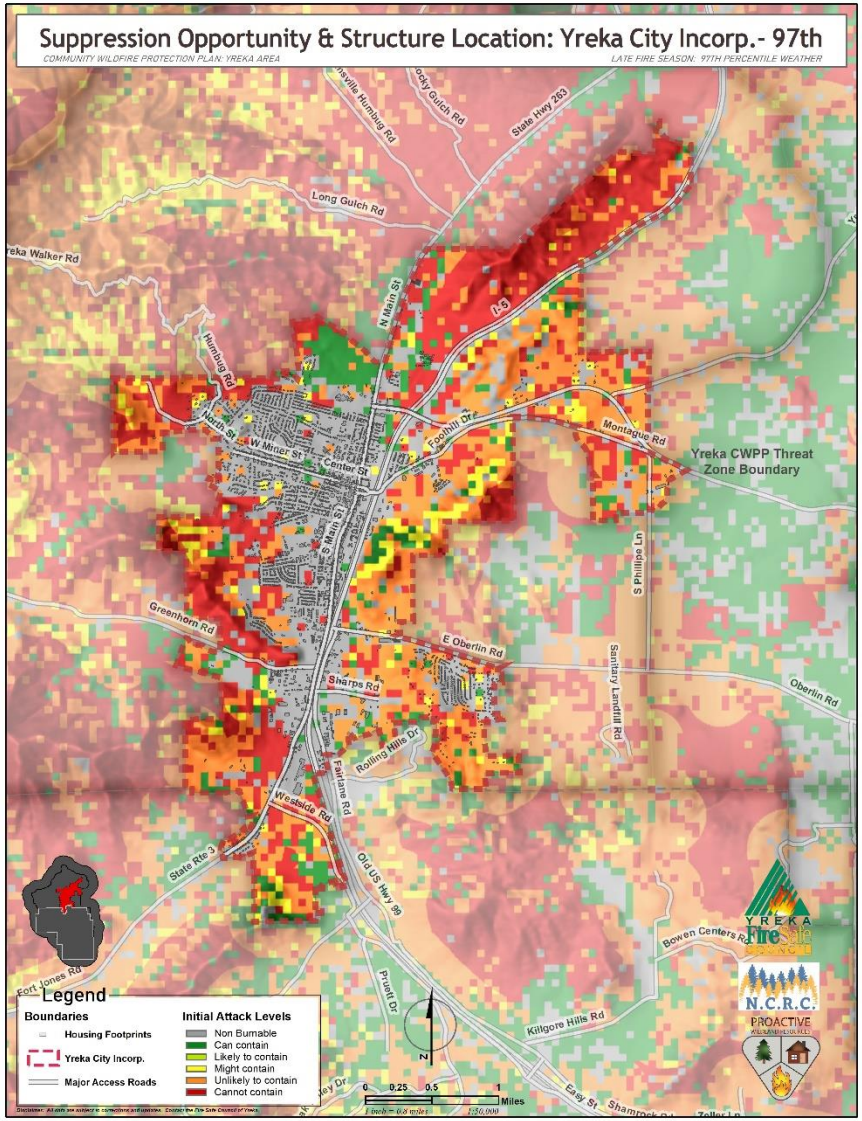


Figure PA8.6. *Suppression Opportunity - Late Fire Season*



Note: The darker the color, the higher flame length/fire intensity.

Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season	
	Not Modeled	Can Contain	Likely to Contain	Might Contain	Not Likely to Contain	Cannot Contain	Total
# Acres / % Acres	2,069 / 32.4%	2,570 / 40.3%	124 / 1.9%	28 / 0.4%	11 / 0.2%	1,581 / 24.8%	6,383 / 100%
No. of Structures	3,185	717	0	0	0	284	4,186
# Acres / % Acres	2,069 / 32.9%	518 / 8.1%	0 / 0%	294 / 4.6%	1,803 / 28.3%	1,699 / 26.6%	6,383 / 100%
No. of Structures	3,185	158	0	104	455	284	4,186

Outcomes/Results

The above analyses provided outputs that were further used to conduct a proximity analysis of structures within 180 feet of IASO map areas with extremely high resistance to control. The results of this work are found in Figures PA 1.7 and 1.8. These tools are for utilization by property owners and local agencies in continued dialogue about where work should be focused, with a goal of potentially accelerating hazard fuel reduction activities within the PA. An annual review of the following items is recommended: 1) local initiatives for fuel treatment, 2) annual actions to protect residential homes and neighborhoods by creating defensible space, and 3) changes such as fires or other actions that may have modified onsite fuels since the prior review.

1. Structures Potentially at Risk

Figure PA1.7 was developed by creating Zones of Concern that extend 300 feet beyond identified structures.

- Red Polygons: Areas within the red polygons are zones that are at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in modeled "Not-Likely-to-Contain" and "Cannot Contain" areas.
- Orange Polygons: These are areas identified that will become more at risk later in the summer and into the fall before the first rains.

Property owners should perform all of their structure hardening and defensible space work as identified in *Section 6* and *Appendix A*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.

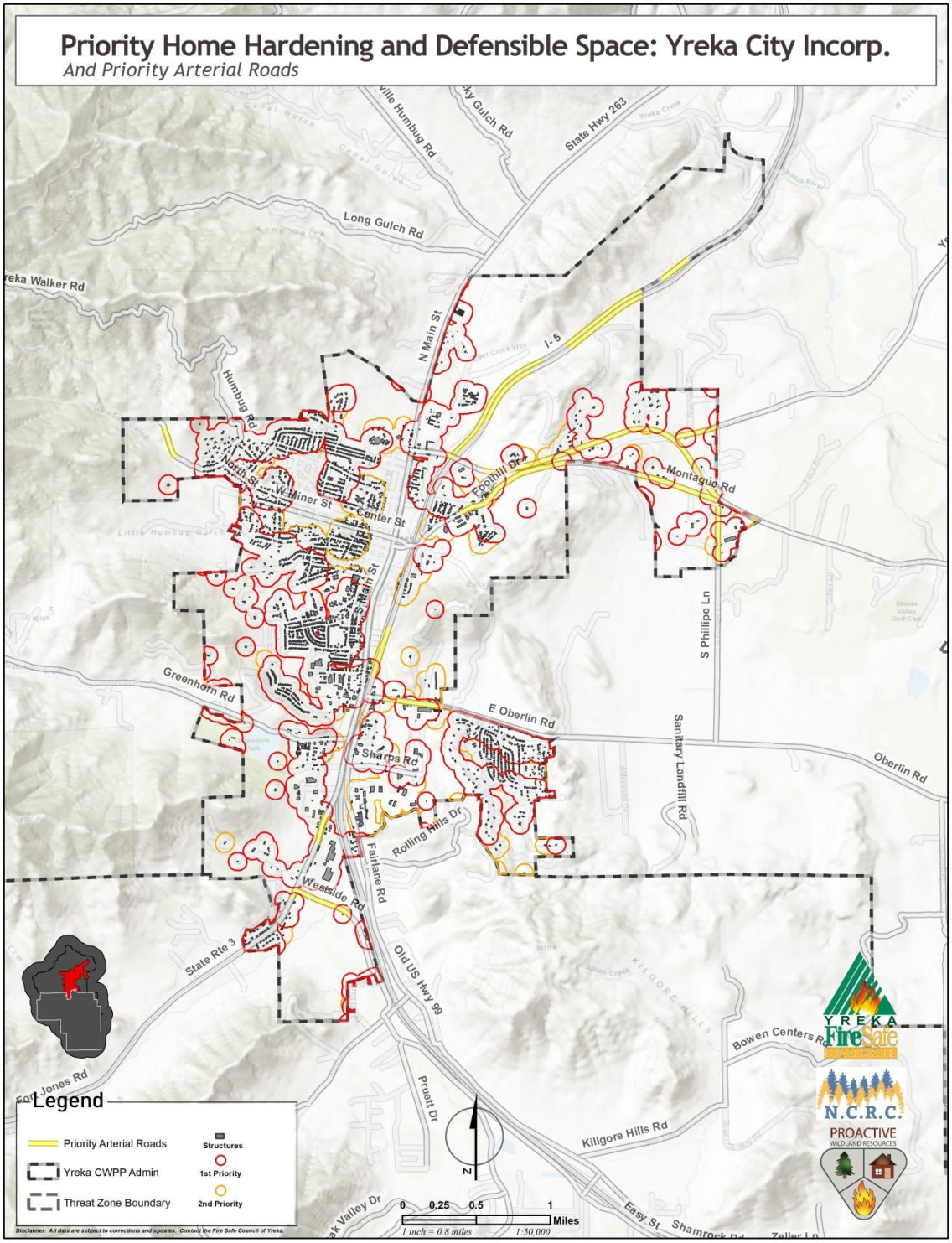
Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

2. Priority Areas/Roads for Hazardous Fuels Mitigation

Figure PA1.8 was developed by overlaying the Burn Probability analysis and Initial Attack Suppression Modeling outputs and suggests the following key priorities for treatments:

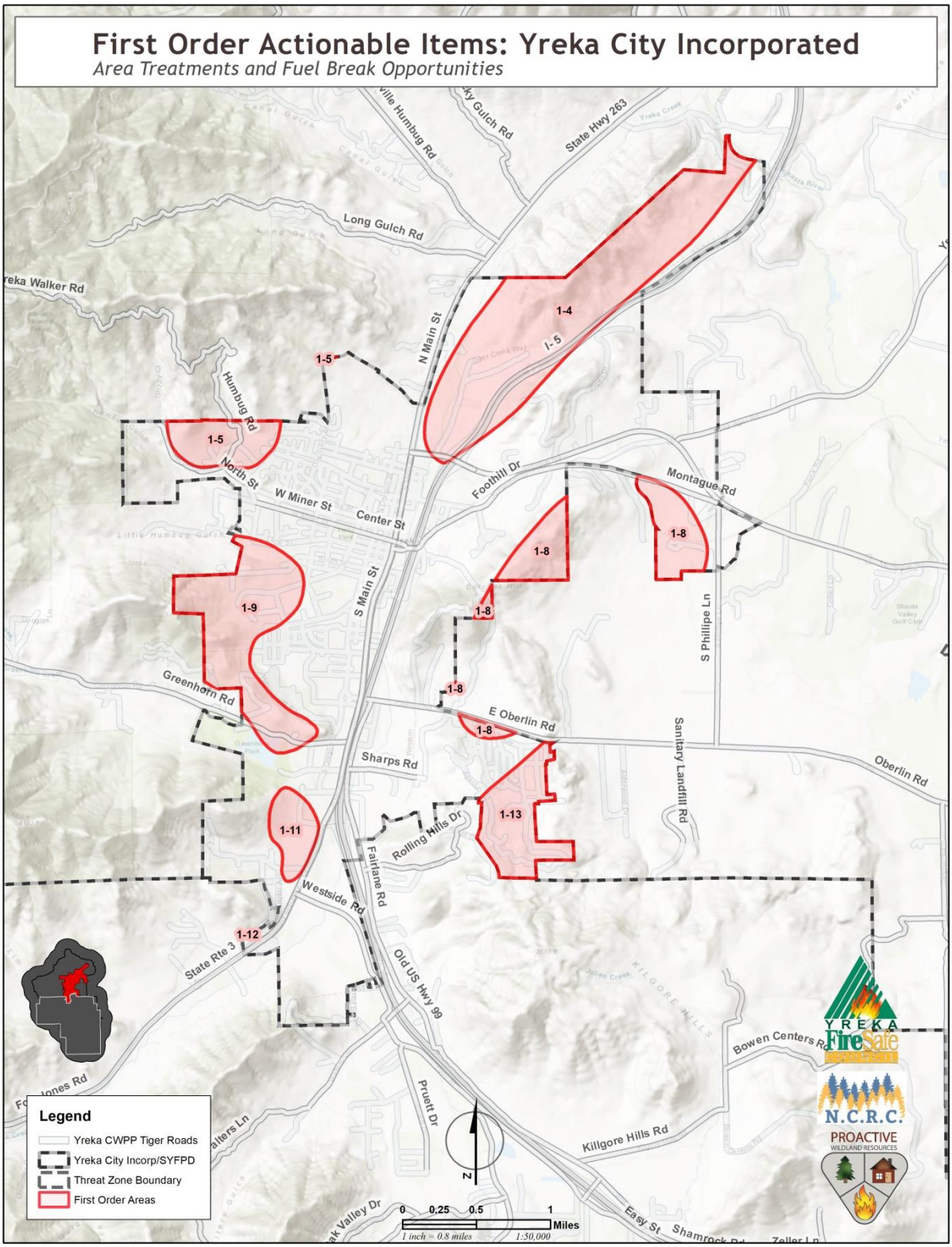
1. Roads/Infrastructure (areas detailed in Figure PA8.7)
2. Areas where structures are highlighted in red polygons
3. Oak Ridge Mobile Estates
4. Butcher Hill Communication Site
5. The general west side of the PA (areas labelled 1-9 and 1-11 in Figure PA8.8 below)
6. The northern extent of the PA (areas labelled 1-4 and 1-5 in Figure PA8.8 below)

Figure PA8.7. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Structures Potentially at Risk		
	Late Season Only	**Early and Late Season**
No. of Structures	758	2,275

Figure PA8.8. *Priority Areas for Hazardous Fuels Mitigation*



Wildfire Protection Resources

The City of Yreka is a Local Responsibility Area. This means that the City has full responsibility for all fires regardless of type. CAL FIRE has wildfire suppression responsibility for all the areas surrounding the City of Yreka. As wildland fires are a threat to State Responsibility Areas (SRA), CAL FIRE will respond and fully support all wildland fire situations that occur within the city limits, as they pose a threat to SRA lands. The Yreka Fire department will have responsibility with CAL FIRE as a partner. The nearest CAL FIRE station is in Yreka. Hornbrook and Ft Jones CAL FIRE stations would respond in most cases. The South Yreka, Montague, and Grenada Fire Departments would respond under mutual aid agreements.

This plan is not intended to modify the provisions of any other agreements which a participating entity may have entered or may enter in the future.

It is the goal of the Agencies to this Agreement to achieve common standards within each agencies' best interest, recognizing differing agency missions and mandates. Each agency to this plan recognizes that other agency standards are reasonable, prudent, and acceptable. This clause is not intended to affect the jurisdictional agency's land management standards.

Primary concerns and challenges faced by protection forces

#1 = Access-ingress/egress are among the highest priority safety elements in a wildfire emergency.

- ✓ 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

Contact information for local fire protection services

State Resources (CAL FIRE)

- **CAL FIRE Yreka Station**
  1809 Fairlane Rd, Yreka, CA 96097 | (530) 842-4359
- **CAL FIRE Hornbrook Station**
  14638 Bradley Henley Rd, Hornbrook, CA 96044 | (530) 475-3582

Local Community & Volunteer Resources

- **Yreka Fire Department**
  401 W. Miner St, Yreka, CA 96097 | (530) 841-2383

- **South Yreka Fire Protection District**
  3420 Easy St. Yreka, CA 96097 | (530) 842-1477
- **Montague Fire Department**
  121 South 10th St, Montague, CA 96064 | (530) 459-5343
- **Grenada Fire Protection District**
  6055 4th Ave, Grenada, CA | (530) 436-2200

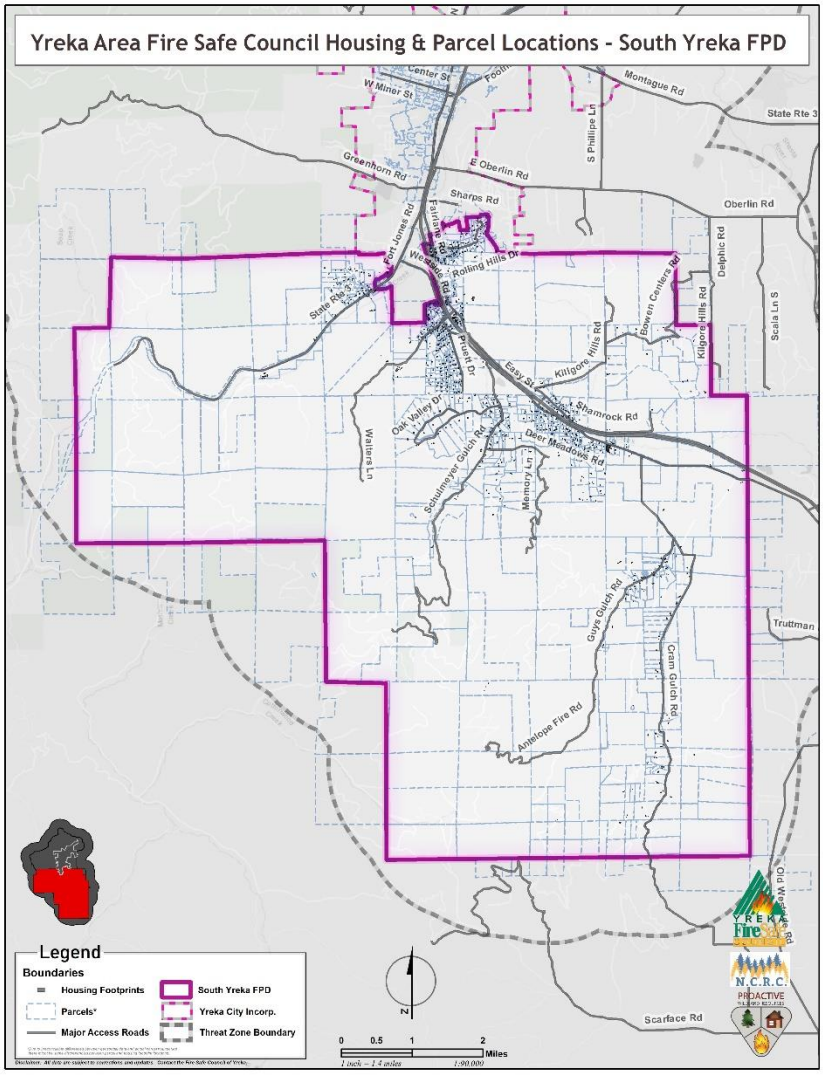
9. South Yreka Fire Protection District

General Overview/Description

The South Yreka Fire Protection District PA provides a complete look at all of the analysis tools and outcomes available in this CWPP for the Chief and Board of Directors of the South Yreka Fire Protection District. The expansion of the SYFPD will bring in homeowners that were previously not covered by a fire department.

The SYFPD is about 39,059 acres in size. There are approximately 1,258 structures that are homes, major structures or businesses. CAL FIRE has wildland fire protection responsibilities with in the district boundary. The SYFPD has structure protection responsibilities.

Figure PA9.1. *Map of the South Yreka FPD Planning Area*



Wildland Fire Environment

Fortunately, the area under the South Yreka Fire Protection District boundary has been spared a large wildland fire event. However, wildfire analysis provided in this PA suggests that the area is still susceptible to an adverse event. Fuels and vegetation conditions are ripe for supporting a severe event if one were to become established.

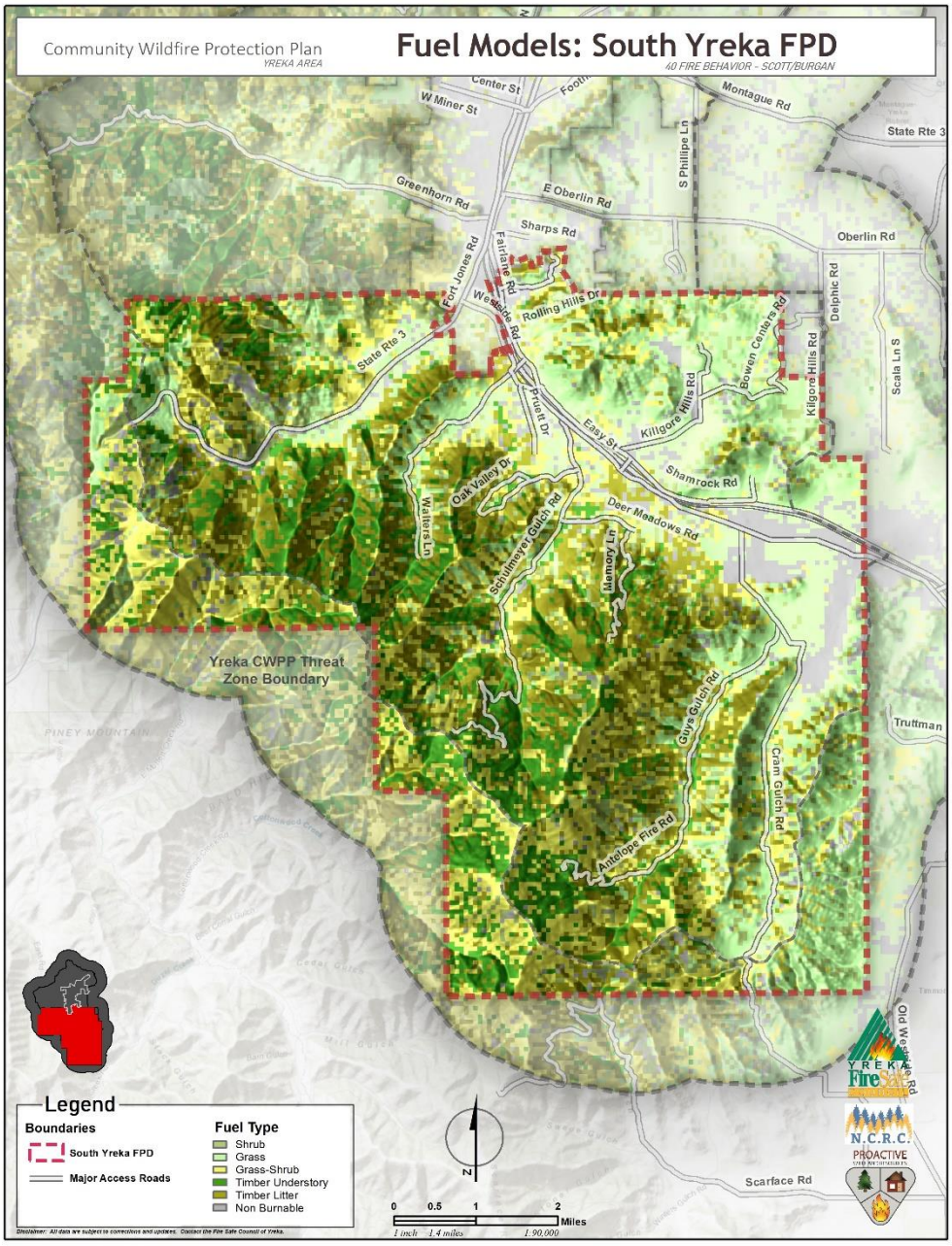
56% of the PA is covered in grass, grass/shrub and/or shrub (Figure PA9.2, Fuel Models). These fuel types are subject to very rapid spread rates during hot, dry summer months, making this PA especially vulnerable as the fire season progresses through summer and into fall. Much of the Kilgore Hills and Cram Gulch areas fall within the vicinity of high burn probabilities in a wildfire ignition (Figures PA9.3 and PA9.4, Burn Probability). The proximity of these areas to zones of population deserves attention, as the fire season progress.

Early fire season fuel conditions and weather conditions present a scenario where only 14% of the modeled fire starts will become problematic. As the season progresses, over 67% of the modeled late fire season starts can become troublesome to suppress (Figures PA9.5 and PA9.6, Suppression Opportunity). The proximity of these areas to zones of population deserves attention, as the fire season progress.

Wind-driven wildfires are the most significant weather concern and are further discussed in the Fire Behavior section below.

Additional key risks of fire starts include the Old Highway 99 corridor, I-5 corridor, areas immediately to the west that are used for off-roading and other recreational pursuits, and lightning storms.

Figure PA9.2. *Fuel Models*



Acres / % Acres of Primary Fuel Types – South Yreka FPD		
	Acres	% Acres
Grass	9,686	24.8%
Grass/Shrub	8,617	22.1%
Shrub	3,603	9.2%
Timber Litter	8,603	22.0%
Timber Understory	5,692	14.6%
Not Modeled	2,856	7.3%
Total	**39,059**	**100%**

Analysis of Expected Fire Behavior

Wildfires respond to weather, fuels (vegetation), and topography. Wind - primarily due to downdrafts from lightning storms or strong prevailing winds - is the most critical weather factor influencing fire behavior. Fuels are typically lighter and fires can be more easily suppressed especially in the lower and mid-slope areas of this PA earlier in the fire season. As the fire season progresses, wildfires become more problematic as summer temperatures increase and fuel moistures decrease.

Figures PA9.3, PA9.4, PA9.5 and PA9.6 and their data tables are unique to this PA and were derived from flame length and rate of spread analyses and for two distinct (early and late) fire season situations (see *Section 5* for a methodology overview and definitions).

The outcomes were considered for two distinct but equally important fire characteristics:

1. Burn Probability

Figures PA9.3 and PA9.4 illustrate Burn Probability, providing an assessment of what areas and which types of fuels are likely to burn provided an ignition. The darker red a shaded area is, the more likely it is to burn. This is important information to determine where hazardous fuel mitigation may need to be focused.

One of the outputs from the Burn Probability modeling is the size of the modeled fires after two burning periods. This knowledge aids in understanding how fires want to burn and to what extent they might burn. Of the 25,000 fires modeled for the Late Fire Season scenario, 4,946 starts fell within the South Yreka Fire Protection District.

- **Early Fire Season (60th percentile weather)**
  The largest fire modeled during early summer simulations was 20 acres. The average fire size was 8.1 acres.

- **Late Fire Season (97th percentile weather)**
  The largest fire modeled during late summer burned 9,259 acres. The largest area burned within the PA was 4,593 acres. Average acres for the simulation 2,341 and average acres within the PA 1,167 acres burned.

Wildfires burn across PA boundaries and simply expand in size and scope wherever burnable material exists. A fire that starts close to one PA boundary may predominantly burn into an adjoining area. When referring below to the "largest" fire burned, this is the total size across all PA boundaries. When "within" the PA, this is the total acres burned within the PA boundary.

2. Initial Attack Suppression Opportunity

Figures PA9.5 and PA9.6 display the outputs from the Initial Attack Suppression Opportunity modeling. This map combines predicted fireline intensity (flame length) and the rate of fire spread data, providing a more detailed and comprehensive view of potential safety concerns, problem fire hazard areas, and access issues. This tool can be useful to first responders to

identify and address area-specific levels of suppression difficulty prior to an emergency. It can also be used by property owners to identify areas where actionable items can be targeted for home hardening/defensible space work and/or targeted hazardous fuels reduction work.

Areas in green are where wildfires are likely to be contained, with areas in red indicating areas of increased suppression difficulty. Areas that present themselves as red early in the season will be of concern throughout the entire season. These areas are a focus for hazard fuels mitigation work as they increase wildfire risk for a longer period of time.

Areas in gray are where: 1) structures are present in a dense enough fashion that no burnable fuel model could be assigned, or 2) areas that will not burn, e.g., irrigated fields, pavement, etc. *Recent fire events across California have shown that areas within the gray can still burn*; the closer to the wildland urban interface, the more vigilance is recommended.

No fire department can be expected to prevent all structural losses in a Wildland Urban Interface (WUI) setting. The potential for a wildfire to outpace suppression efforts means that all property owners in WUI areas accept a high degree of risk as well as responsibility.

Figure PA9.3. *Burn Probability - Early Fire Season*

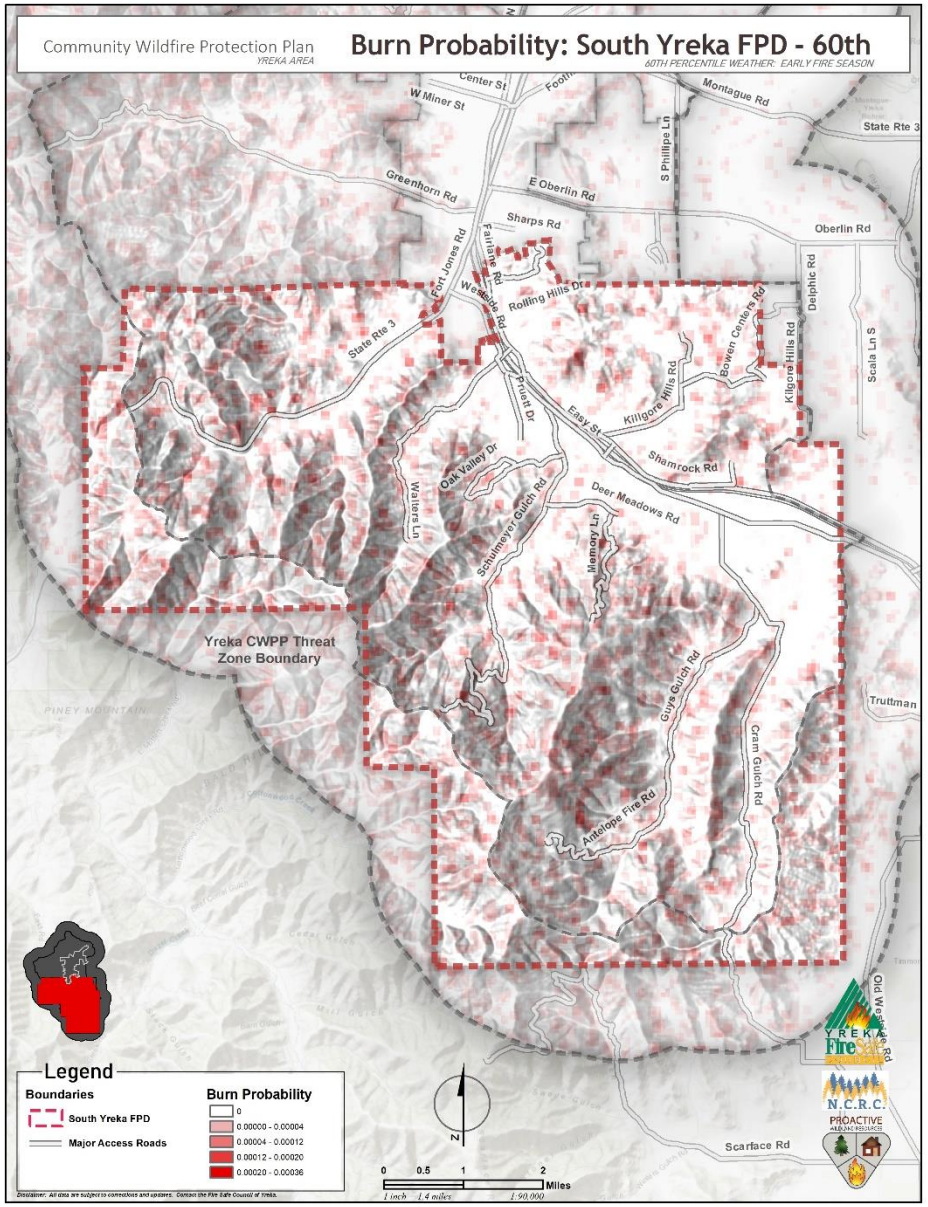
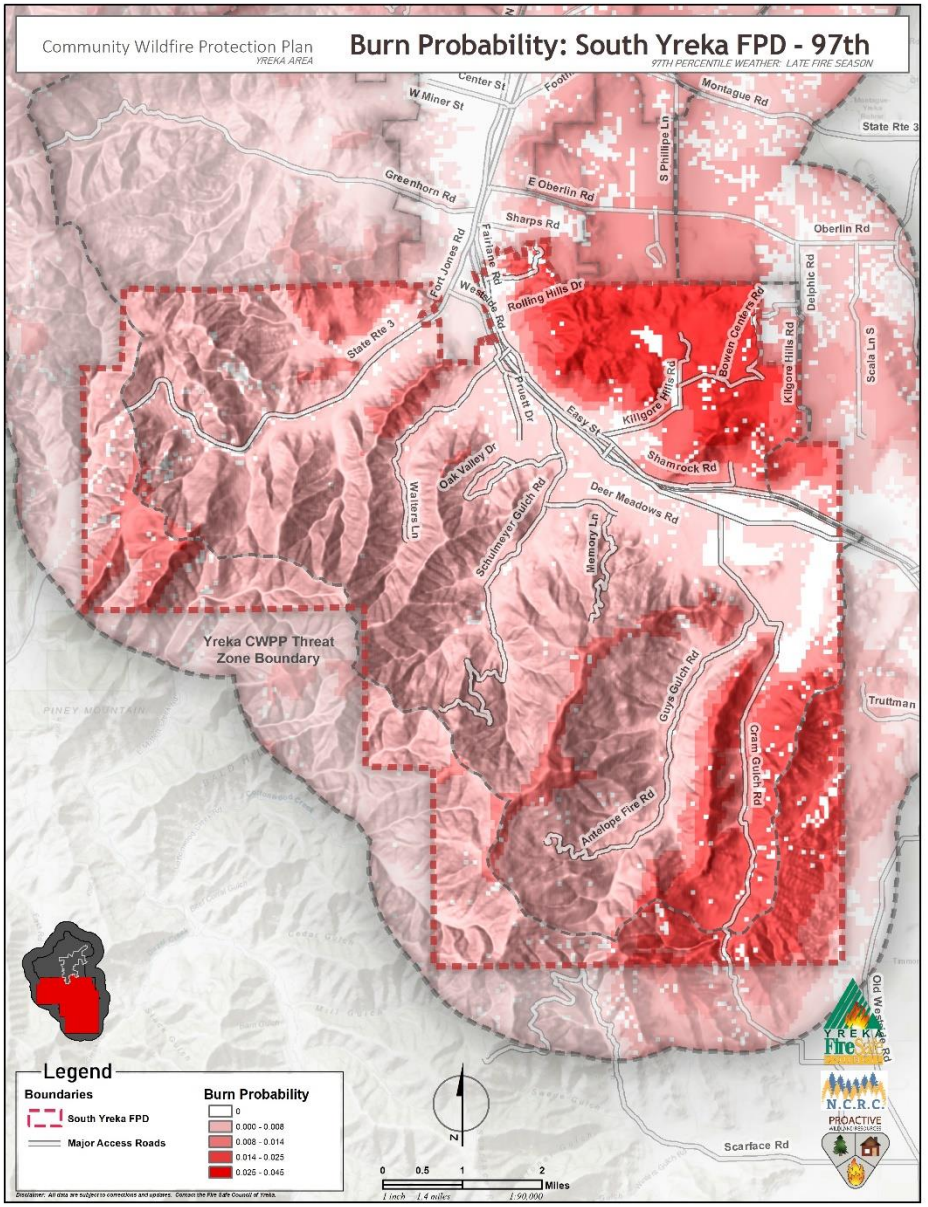


Figure PA9.4. *Burn Probability* **-** *Late Fire Season*



Number of Modeled Fires by Fire Size Class				Early Fire Season			Late Fire Season	
Size Class in Acres	**Class A: 0 to .25**	**Class B: .25 to 10**	**Class C: 10 t0 100**	**Class D: 100 to 300**	**Class E: 300 to 1K**	**Class F: 1K to 5K**	**Class G: 5K +plus**	**Total**
# of Fires / % Fires		2,945 / 93%	224 / 7%					3,169 / 100%
# of Fires / % Fires		2 / 0.0%	6 / 0.1%	37 / 0.7%%	1,374 / 27.8%	3,158 / 63.8%	369 / 7.5%	4,946 / 100%

Figure PA9.5. *Suppression Opportunity - Early Fire Season*

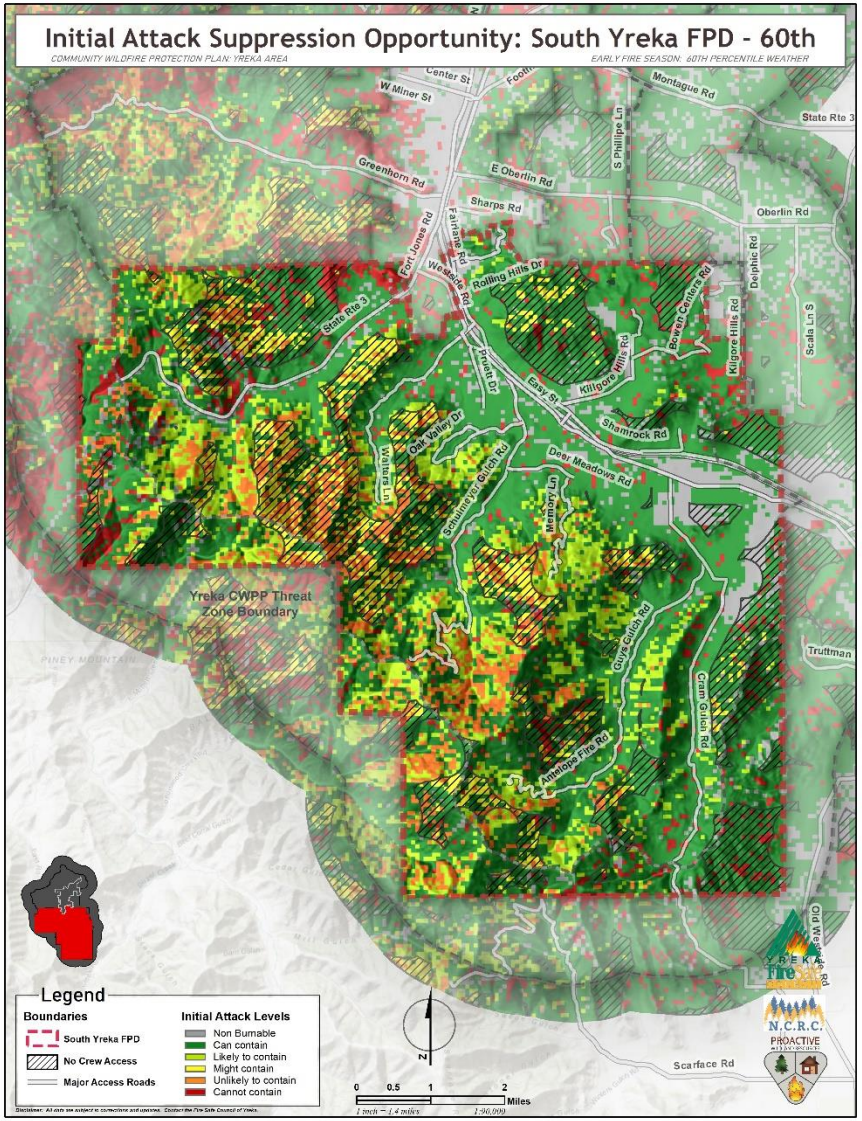
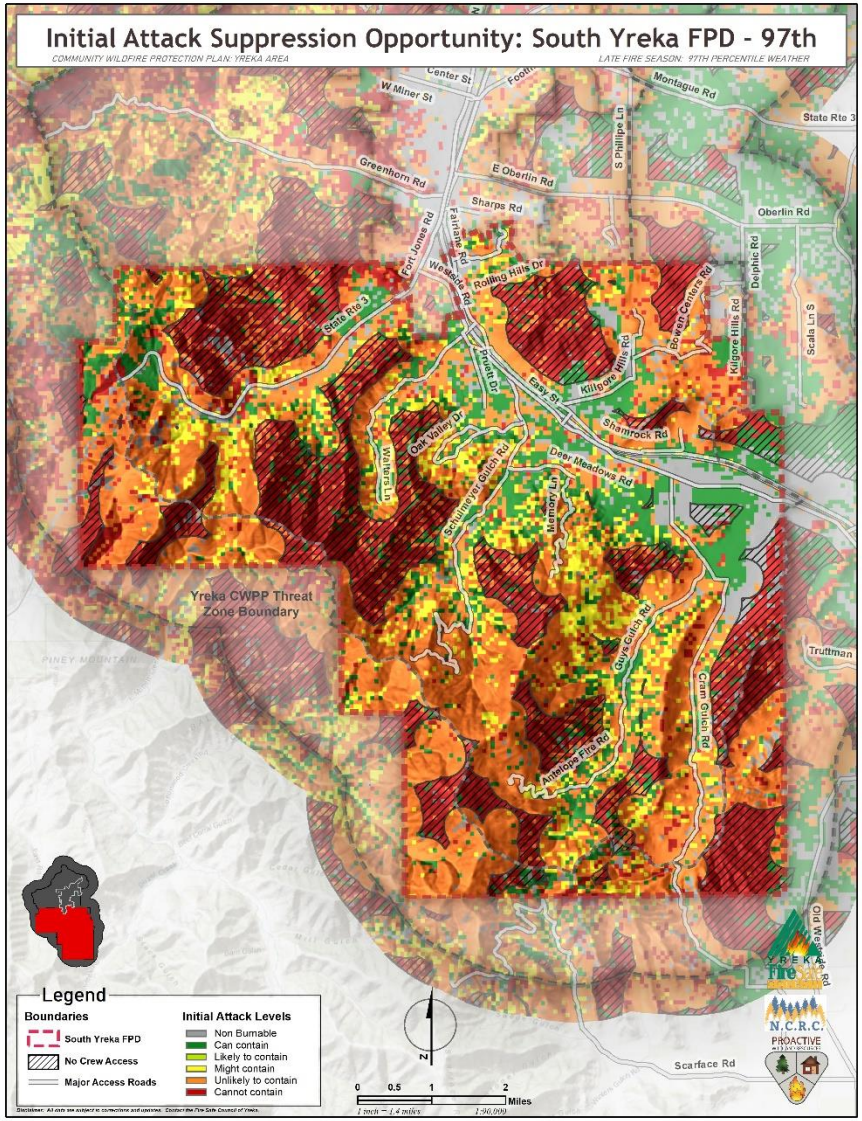


Figure PA9.6. *Suppression Opportunity - Late Fire Season*



Note: The darker the color, the higher flame length/fire intensity.

Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season	
	Not Modeled	Can Contain	Likely to Contain	Might Contain	Not Likely to Contain	Cannot Contain	Total
# Acres / % Acres	2,856 / 7.3%	23,460 / 60.1%	4,709 / 12.1%	2,303 / 5.9%	3,332 / 8.5%	2,398 / 6.1%	39,059 / 100%
No. of Structures	421	1,083	23	0	0	97	1,624
# Acres / % Acres	2,856 / 7.3%	6,132 / 15.7%	0 / 0%	3,605 / 9.2%	16,485 / 42.2%	9,980 / 25.6%	39,059 / 100%
No. of Structures	421	407	0	160	539	97	1,624

Outcomes/Results

The above analyses provided outputs that were further used to conduct a proximity analysis of structures within 180 feet of IASO map areas with extremely high resistance to control. The results of this work are found in Figures PA 9.7 and 9.8. These tools are for utilization by property owners and local agencies in continued dialogue about where work should be focused, with a goal of potentially accelerating hazard fuel reduction activities within the PA. An annual review of the following items is recommended: 1) local initiatives for fuel treatment, 2) annual actions to protect residential homes and neighborhoods by creating defensible space, and 3) changes such as fires or other actions that may have modified onsite fuels since the prior review.

1. Structures Potentially at Risk

Figure PA9.7 was developed by creating Zones of Concern that extend 300 feet beyond identified structures.

- Red Polygons: Areas within the red polygons are zones that are at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in modeled "Not-Likely-to-Contain" and "Cannot Contain" areas.
- Orange Polygons: These are areas identified that will become more at risk later in the summer and into the fall before the first rains.

Property owners should perform all of their structure hardening and defensible space work as identified in *Section 6* and *Appendix A*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.

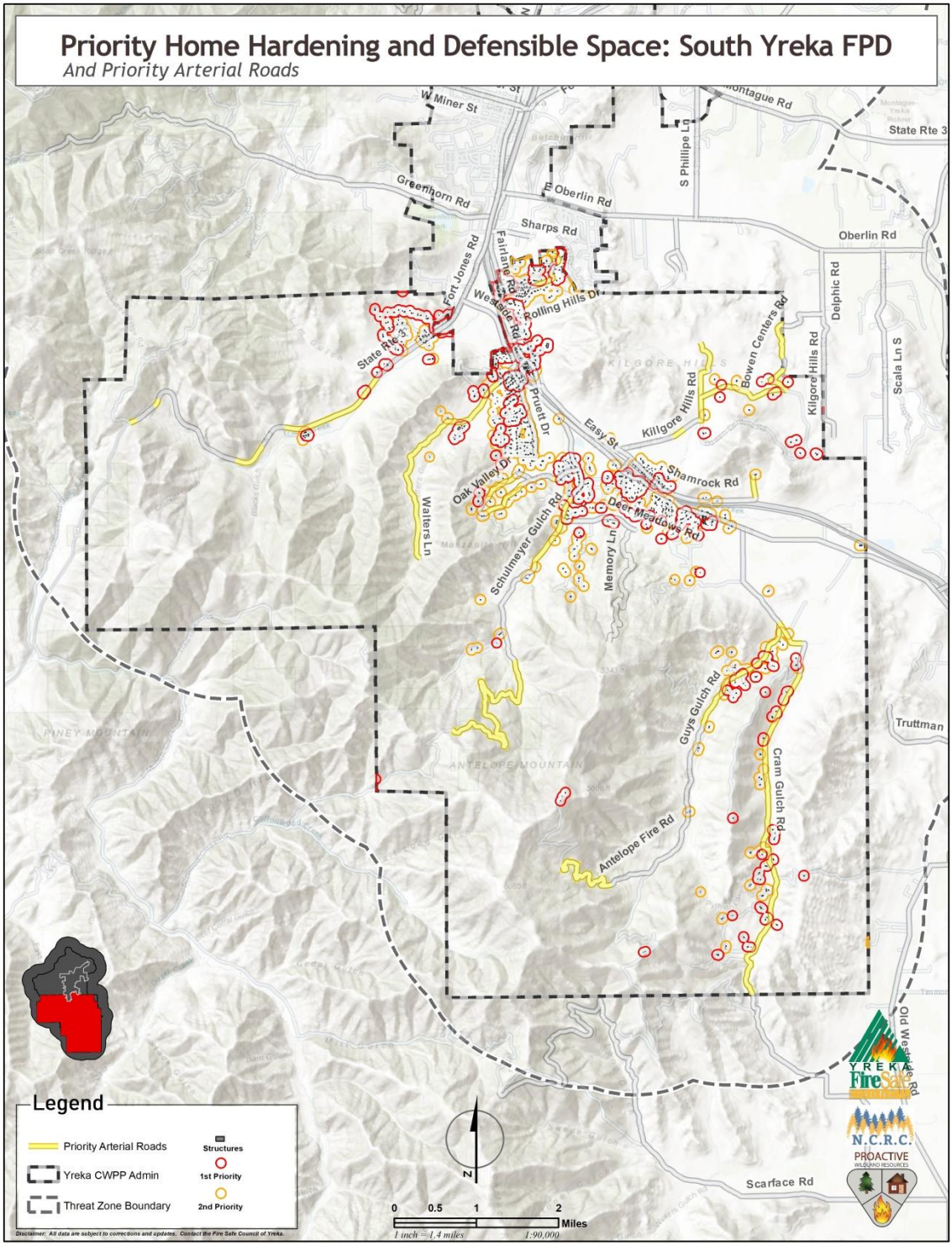
Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

2. Priority Areas/Roads for Hazardous Fuels Mitigation

Figure PA9.8 was developed by overlaying the Burn Probability analysis and Initial Attack Suppression Modeling outputs and suggests the following key priorities for treatments:

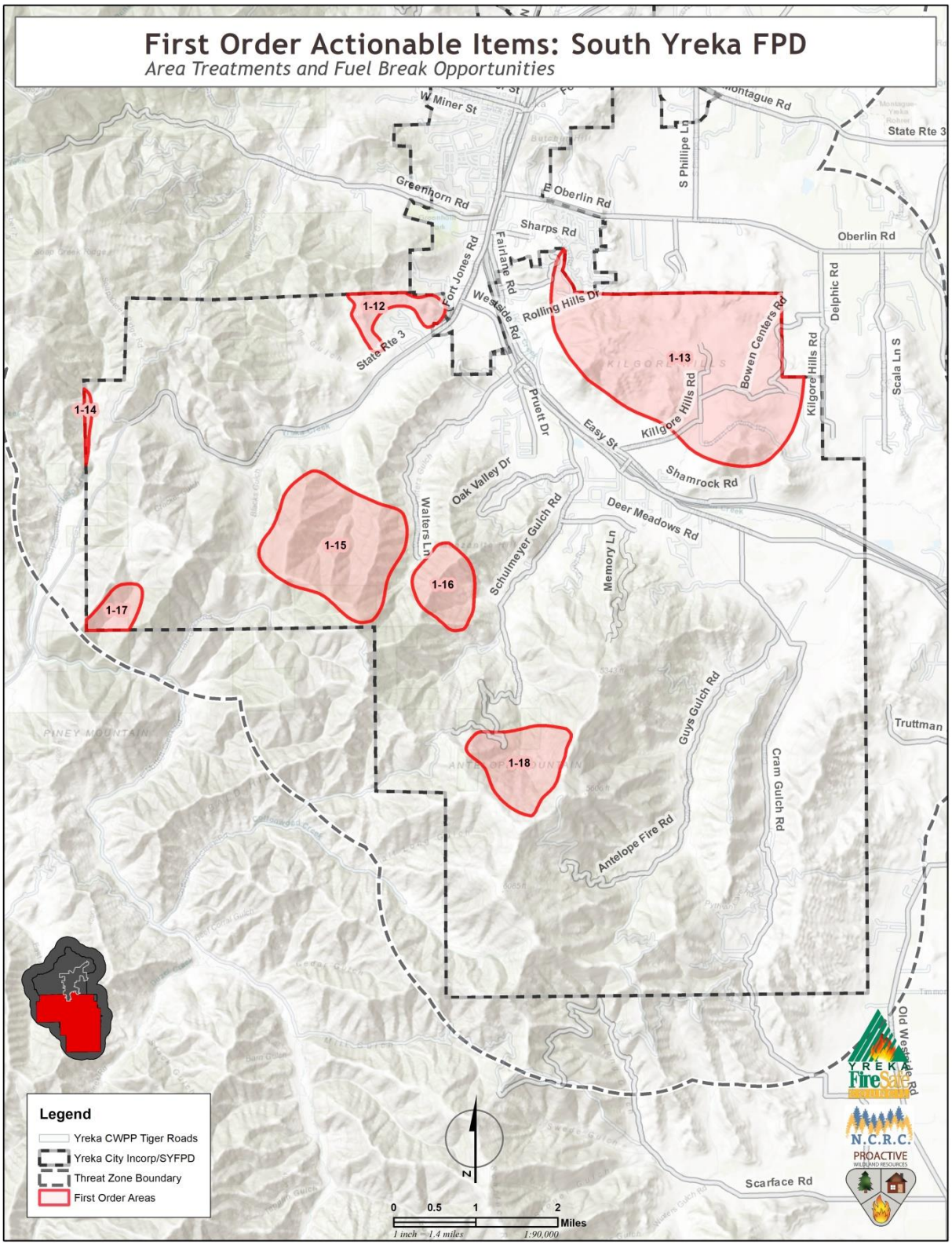
1. Roads/Infrastructure (areas detailed in Figure PA9.7)
2. Areas where structures are highlighted by red polygons
3. Antelope Communications Site
4. Kilgore Hills
5. Cram Gulch Road
6. There are areas of concern at the base of Highway 3 that need to be addressed. These stand out as they are proximate to areas of high use by motorists exiting and using services Area 1-10 and 1-11 is an area with many homes and structures. Highway 3 experiences high use.
7. The upper reaches of Walters Gulch Areas 1-13 and 1-14.

Figure PA9.7. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Structures Potentially at Risk		
	Late Season Only	**Early and Late Season**
No. of Structures	575	688

Figure PA9.8. *Priority Areas for Hazardous Fuels Mitigation*



Wildfire Protection Resources

The South Yreka Fire Protection District Volunteer Fire Department has responsibility for structure fires. The entire district is in State Responsibility Area; therefore, CAL FIRE has wildland fire protection responsibilities. The nearest CAL FIRE station is in Yreka. Hornbrook and Ft Jones CAL FIRE stations would respond in most cases. Yreka, Grenada, and Montague Fire Departments would respond under mutual aid agreements.

This plan is not intended to modify the provisions of any other agreements which a participating entity may have entered or may enter in the future.

It is the goal of the Agencies to this Agreement to achieve common standards within each agencies' best interest, recognizing differing agency missions and mandates. Each agency to this plan recognizes that other agency standards are reasonable, prudent, and acceptable. This clause is not intended to affect the jurisdictional agency's land management standards.

Primary concerns and challenges faced by protection forces

#1 = Access-ingress/egress are among the highest priority safety elements in a wildfire emergency.

- ✓ 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

Contact information for local fire protection services

State Resources (CAL FIRE)

- **CAL FIRE Yreka Station**
  1809 Fairlane Rd, Yreka, CA 96097 | (530) 842-4359
- **CAL FIRE Hornbrook Station**
  14638 Bradley Henley Rd, Hornbrook, CA 96044 | (530) 475-3582

Local Community & Volunteer Resources

- **Yreka Fire Department**
  401 W. Miner St, Yreka, CA 96097 | (530) 841-2383
- **South Yreka Fire Protection District**
  3420 Easy St. Yreka, CA 96097 | (530) 842-1477

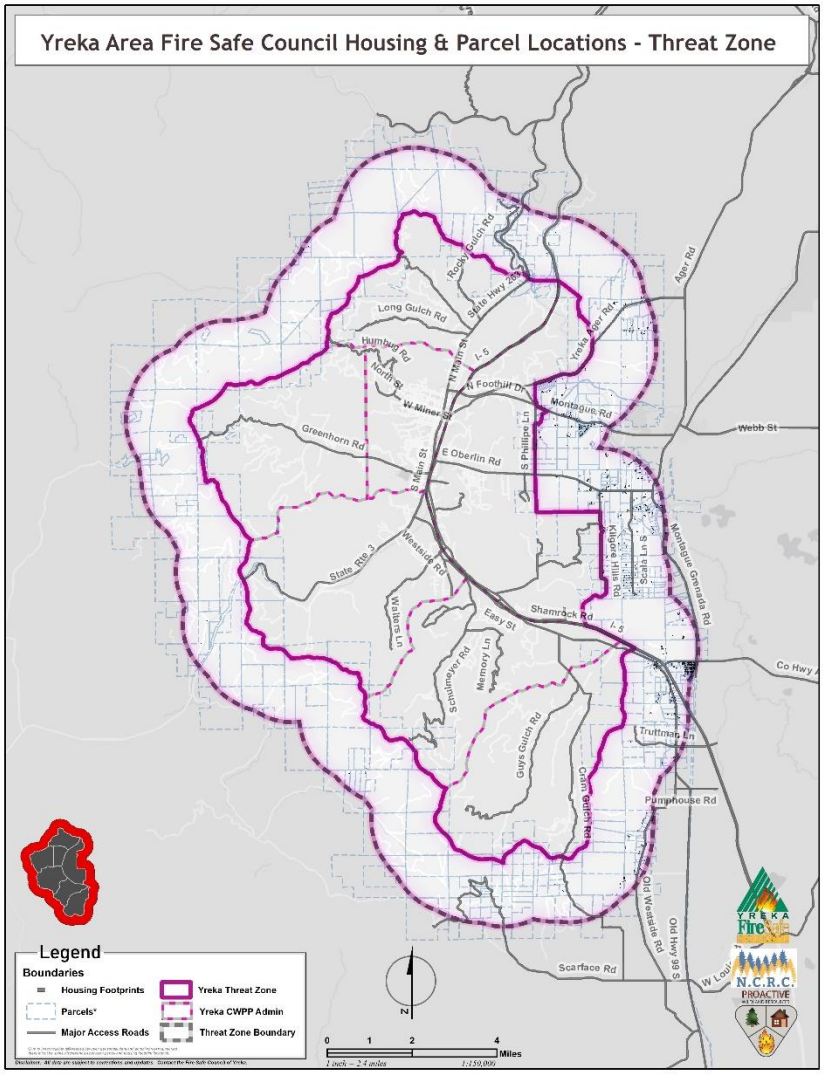
- **Grenada Fire Protection District**
  6055 4th Ave, Grenada, CA 96038 | (530) 436-2200
- **Montague Fire Department**
  121 South 10th St, Montague, CA 96064 | (530) 459-5343

General Overview/Description

The Threat Zone is a 1½ mile belt that surrounds the Yreka Area WUI. The purpose behind this zone is for assessing potential areas of concern outside the Yreka WUI that could present problems if they were to burn toward the city. It is zone of opportunity for collaboration with partners and cooperators.

It is about 48,338 acres in size with 1,072 identified structures, most of which are concentrated on east side of the band. There are pockets of population east of Phillipe Road, east of Kilgore Hills Road and as one moves south within the Zone towards Grenada.

Figure PA10.1. *Map of the Threat Zone Planning Area*



Wildland Fire Environment

The 2020 Badger fire occurred in the northern most portion of this PA. The Badger Fire burned 557 acres on Badger Mountain Road and Hawkinsville Humbug Road within sight of Yreka, prompting evacuation orders and warnings. The fire was caused by a vehicle. This zone also experienced the 64,000 acre 1955 Haystack fire that came up out of the Klamath River drainage towards the city of Yreka.

66% of the PA is covered in grass, grass/shrub and/or shrub (Figure PA10.2, Fuel Models). These fuel types are subject to very rapid spread rates during hot, dry summer months, making this PA especially vulnerable as the fire season progresses through summer and into fall. The southwest corner and the eastern edge of the PA are in the vicinity of high burn probabilities in a wildfire ignition (Figures PA10.3 and PA10.4, Burn Probability). The proximity of these areas to zones of population deserves attention, as the fire season progress.

Early fire season fuel conditions and weather conditions present a scenario where over 20% of the modeled fire starts will become problematic. As the season progresses, 65% of the modeled late fire season starts can become troublesome to suppress (Figures PA10.5 and PA10.6, Suppression Opportunity). The proximity of these areas to zones of population deserves attention, as the fire season progress.

Wind-driven wildfires are the most significant weather concern and are further discussed in the Expected Fire Behavior section below. The primary concern for the north, west and south end of the Threat Zone is lightning starts as there are few access points for human interactions.

Figure PA10.2. *Fuel Models*

Acres / % Acres of Primary Fuel Types – Threat Zone		
	Acres	% Acres
Grass	14,091	29.2%
Grass/Shrub	10,241	21.2%
Shrub	7,741	16.0%
Timber Litter	6,557	13.6%
Timber Understory	6,061	9.9%
Not Modeled	4,936	10.2%
Total	**48,338**	**100%**

Analysis of Expected Fire Behavior

Wildfires respond to weather, fuels (vegetation), and topography. Wind - primarily due to downdrafts from lightning storms or strong prevailing winds - is the most critical weather factor influencing fire behavior. Fuels are typically lighter and fires can be more easily suppressed especially in the lower and mid-slope areas of this PA earlier in the fire season. As the fire season progresses, wildfires become more problematic as summer temperatures increase and fuel moistures decrease.

Figures PA10.3, PA10.4, PA10.5 and PA10.6 and their data tables are unique to this PA and were derived from flame length and rate of spread analyses and for two distinct (early and late) fire season situations (see *Section 5* for a methodology overview and definitions).

The outcomes were considered for two distinct but equally important fire characteristics:

1. Burn Probability

Figures PA10.3 and PA10.4 illustrate Burn Probability, providing an assessment of what areas and which types of fuels are likely to burn provided an ignition. The darker red a shaded area is, the more likely it is to burn. This is important information to determine where hazardous fuel mitigation may need to be focused.

One of the outputs from the Burn Probability modeling is the size of the modeled fires after two burning periods. This knowledge aids in understanding how fires want to burn and to what extent they might burn.

- **Early Fire Season (60th percentile weather)**
  The largest fire modeled during early summer simulations was 26 acres. The average fire size was 8.5 acres.

- **Late Fire Season (97th percentile weather)**
  The largest fire modeled during late summer burned 16,225 acres. The largest area burned within the PA was 7,485 acres. Average acres for the simulation 2,876 and average acres within the PA 1,135 acres burned.

Wildfires burn across PA boundaries and simply expand in size and scope wherever burnable material exists. A fire that starts close to one PA boundary may predominantly burn into an adjoining area. When referring below to the "largest" fire burned, this is the total size across all PA boundaries. When "within" the PA, this is the total acres burned within the PA boundary.

2. Initial Attack Suppression Opportunity

Figures PA10.5 and PA10.6 display the outputs from the Initial Attack Suppression Opportunity modeling. This map combines predicted fireline intensity (flame length) and the rate of fire spread data, providing a more detailed and comprehensive view of potential safety concerns, problem fire hazard areas, and access issues. This tool can be useful to first responders to

identify and address area-specific levels of suppression difficulty prior to an emergency. It can also be used by property owners to identify areas where actionable items can be targeted for home hardening/defensible space work and/or targeted hazardous fuels reduction work.

Areas in green are where wildfires are likely to be contained, with areas in red indicating areas of increased suppression difficulty. Areas that present themselves as red early in the season will be of concern throughout the entire season. These areas are a focus for hazard fuels mitigation work as they increase wildfire risk for a longer period of time.

Areas in gray are where: 1) structures are present in a dense enough fashion that no burnable fuel model could be assigned, or 2) areas that will not burn, e.g., irrigated fields, pavement, etc. *Recent fire events across California have shown that areas within the gray can still burn*; the closer to the wildland urban interface, the more vigilance is recommended.

No fire department can be expected to prevent all structural losses in a Wildland Urban Interface (WUI) setting. The potential for a wildfire to outpace suppression efforts means that all property owners in WUI areas accept a high degree of risk as well as responsibility.

Figure PA10.3. *Burn Probability - Early Fire Season*

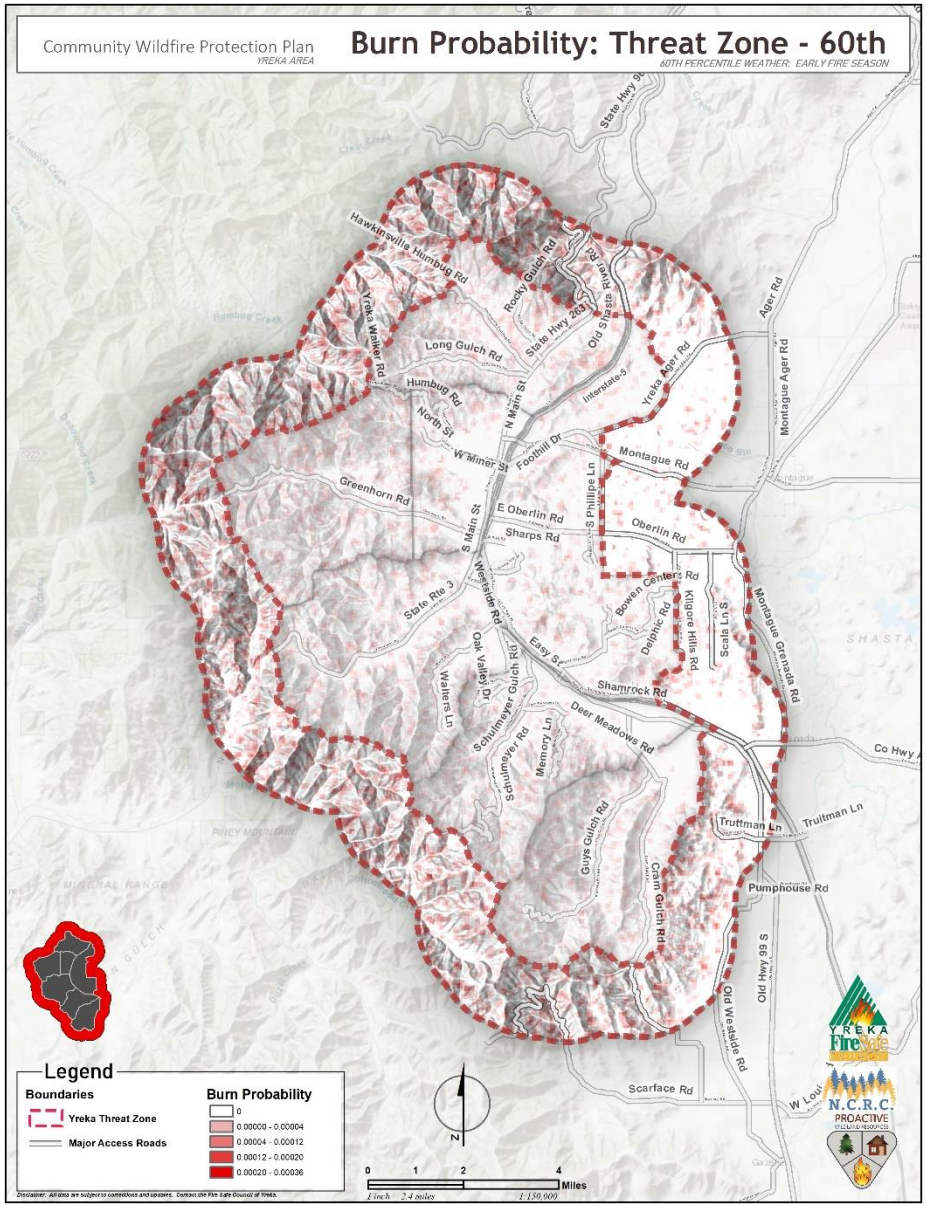
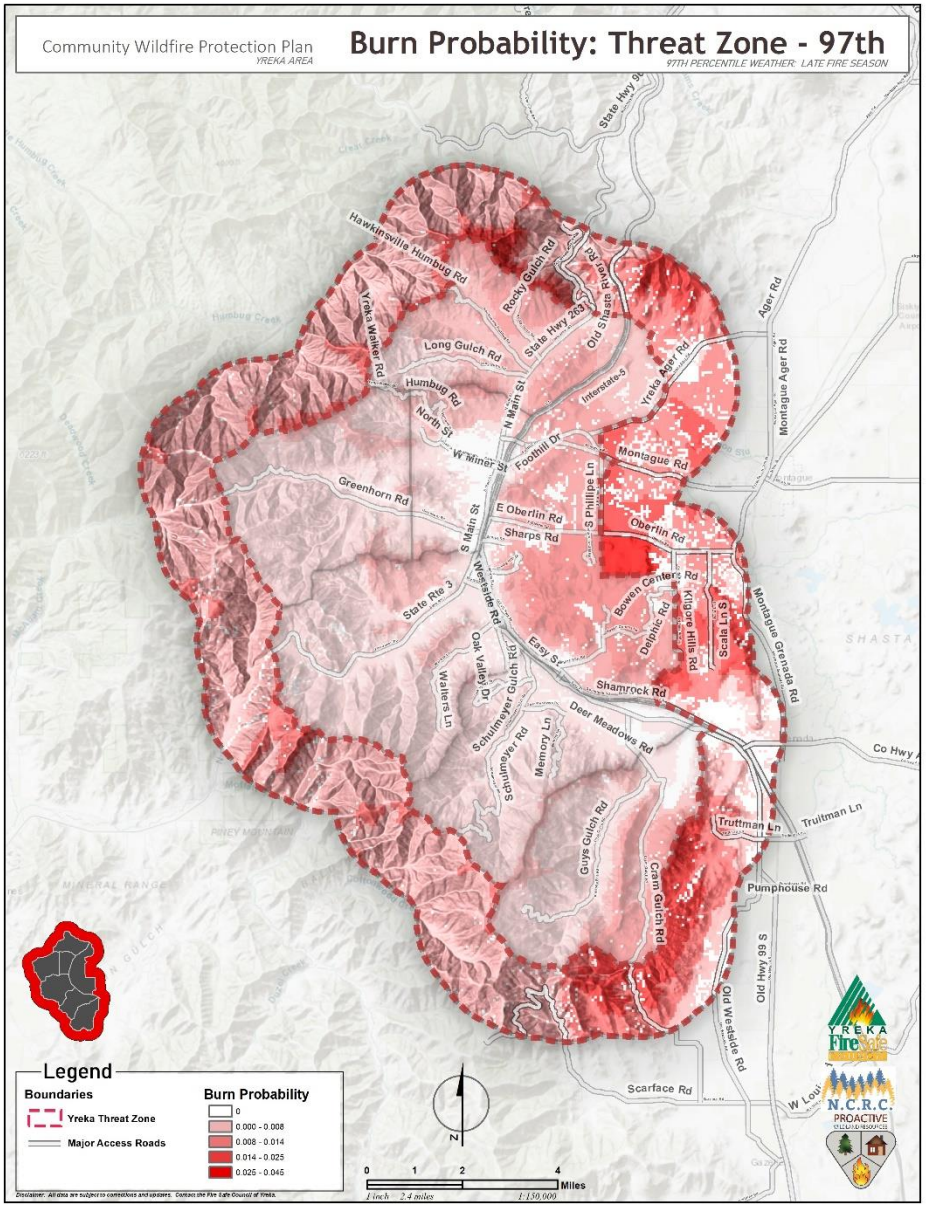


Figure PA10.4. *Burn Probability* **-** *Late Fire Season*



Number of Modeled Fires by Fire Size Class				Early Fire Season			Late Fire Season	
Size Class in Acres	**Class A: 0 to .25**	**Class B: .25 to 10**	**Class C: 10 t0 100**	**Class D: 100 to 300**	**Class E: 300 to 1K**	**Class F: 1K to 5K**	**Class G: 5K +plus**	**Total**
# of Fires / % Acres		3,369 / 85%	590 / 15%					3,959 / 100%
# of Fires / % Fires		17 / 0.2%	22 / 0.3%	77 / 0.9%%	1,893/ 23.3%	4,900/ 60.2%	1,228 / 15.5%	8,137 / 100%

Figure PA10.5. *Suppression Opportunity - Early Fire Season*

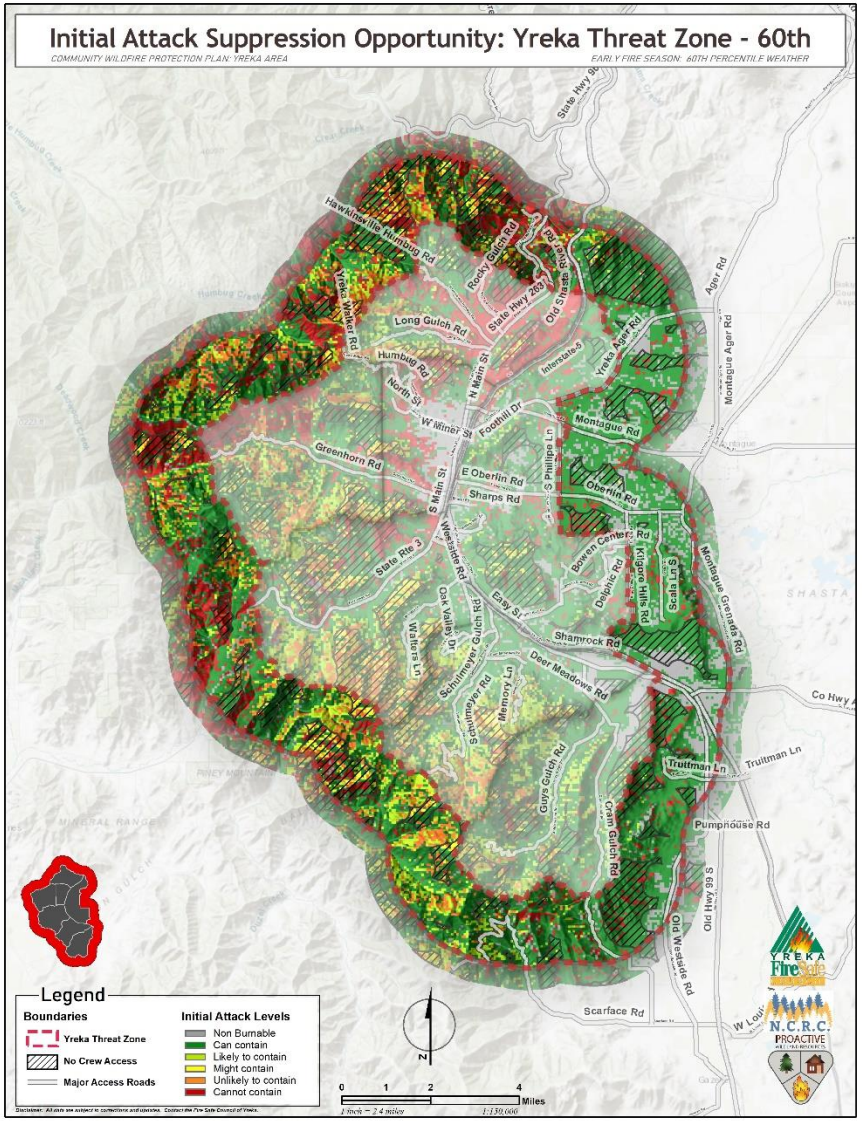
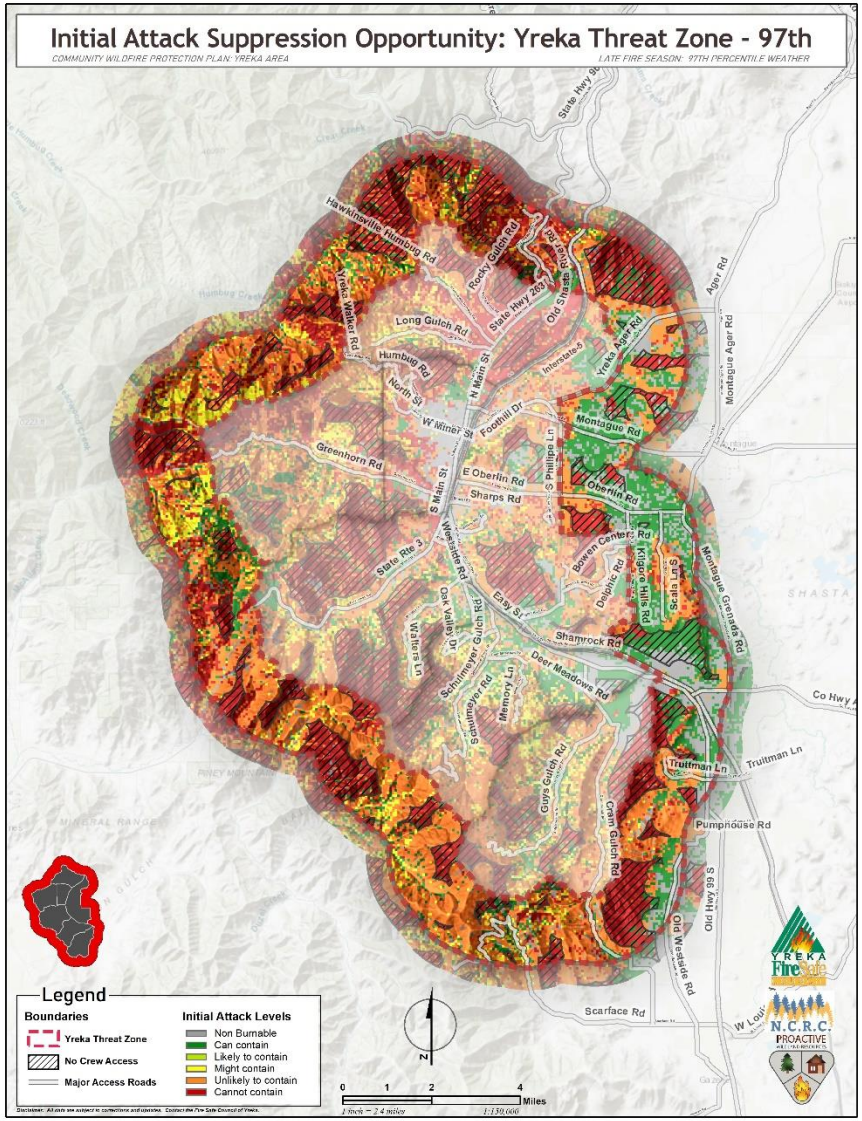


Figure PA10.6. *Suppression Opportunity - Late Fire Season*



Note: The darker the color, the higher flame length/fire intensity.

Number of Modeled Fires by Fire Size Class				Early Fire Season		Late Fire Season	
	Not Modeled	Can Contain	Likely to Contain	Might Contain	Not Likely to Contain	Cannot Contain	Total
# Acres / % Acres	4,936 / 10.2%	28,502 / 59.0%	3,457 / 7.2%	1,130 / 2.3%	3,618 / 7.5%	6,696 / 13.9%	48,338 / 100%
No. of Structures	496	508	0	0	1	67	1,072
# Acres / % Acres	4,936 / 10.2%	8,667 / 17.9%	0 / 0%	3,008/ 6.2%	17,942 / 37.1%	13,785 / 28.5%	48,338 / 100%
No. of Structures	496	336	0	5	165	70	1,072

Outcomes/Results

The above analyses provided outputs that were further used to conduct a proximity analysis of structures within 180 feet of IASO map areas with extremely high resistance to control. The results of this work are found in Figures PA 10.7 and 10.8. These tools are for utilization by property owners and local agencies in continued dialogue about where work should be focused, with a goal of potentially accelerating hazard fuel reduction activities within the PA. An annual review of the following items is recommended: 1) local initiatives for fuel treatment, 2) annual actions to protect residential homes and neighborhoods by creating defensible space, and 3) changes such as fires or other actions that may have modified onsite fuels since the prior review.

1. Structures Potentially at Risk

Figure PA10.7 was developed by creating Zones of Concern that extend 300 feet beyond identified structures.

- Red Polygons: Areas within the red polygons are zones that are at greatest risk for the longest period of time during the fire season. Fire modeling indicated that these areas were in modeled "Not-Likely-to-Contain" and "Cannot Contain" areas.
- Orange Polygons: These are areas identified that will become more at risk later in the summer and into the fall before the first rains.

Property owners should perform all of their structure hardening and defensible space work as identified in *Section 6* and *Appendix A*. This work should be carried out as soon as possible starting in early spring for areas with red polygons, followed by areas with orange polygons as the next highest priority.

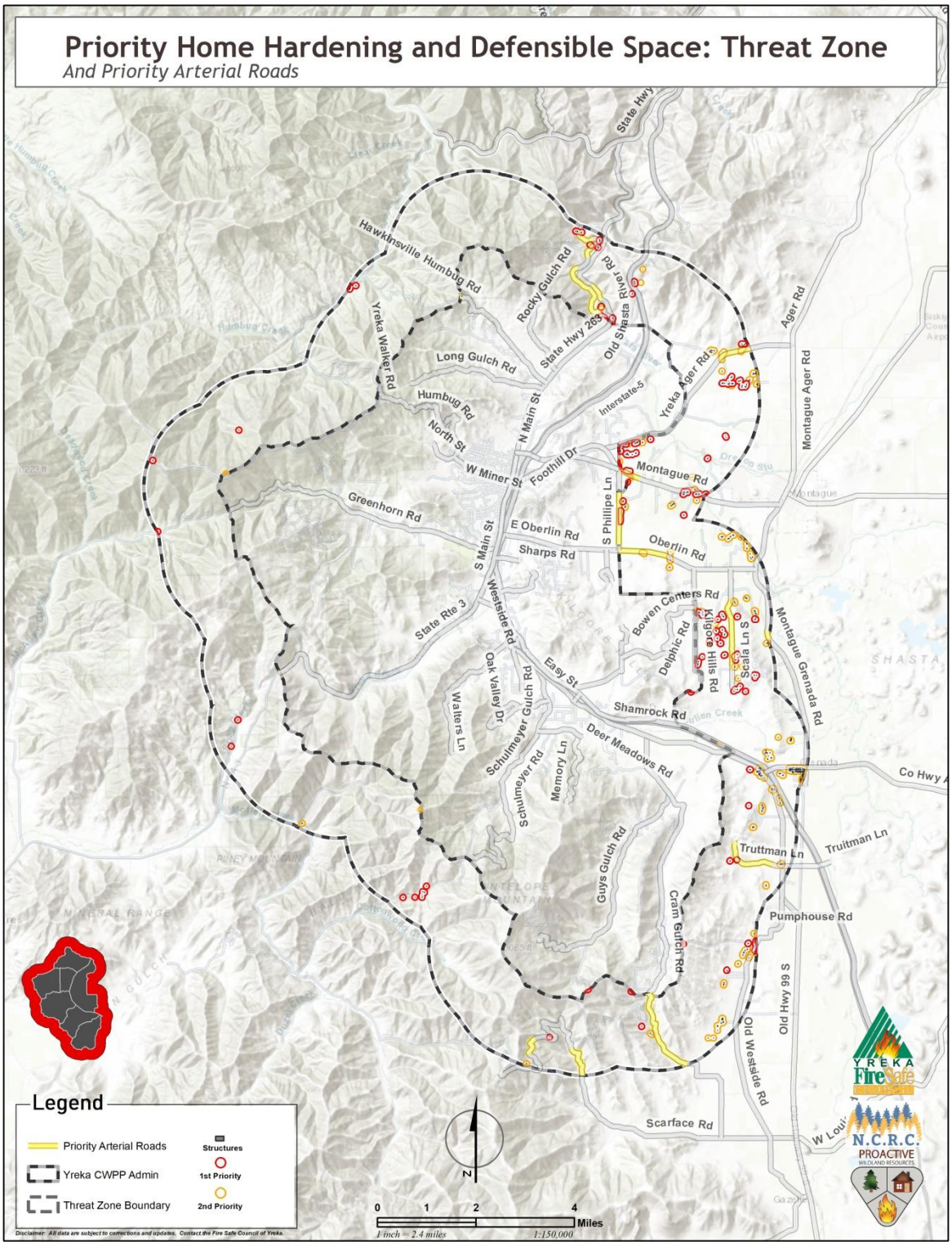
Agencies, responsible parties and community members should identify priority areas for treatment and work outside their immediate defensible space.

2. Priority Areas/Roads for Hazardous Fuels Mitigation

Figure PA10.8 was developed by overlaying the Burn Probability analysis and Initial Attack Suppression Modeling outputs and suggests the following key priorities for treatments:

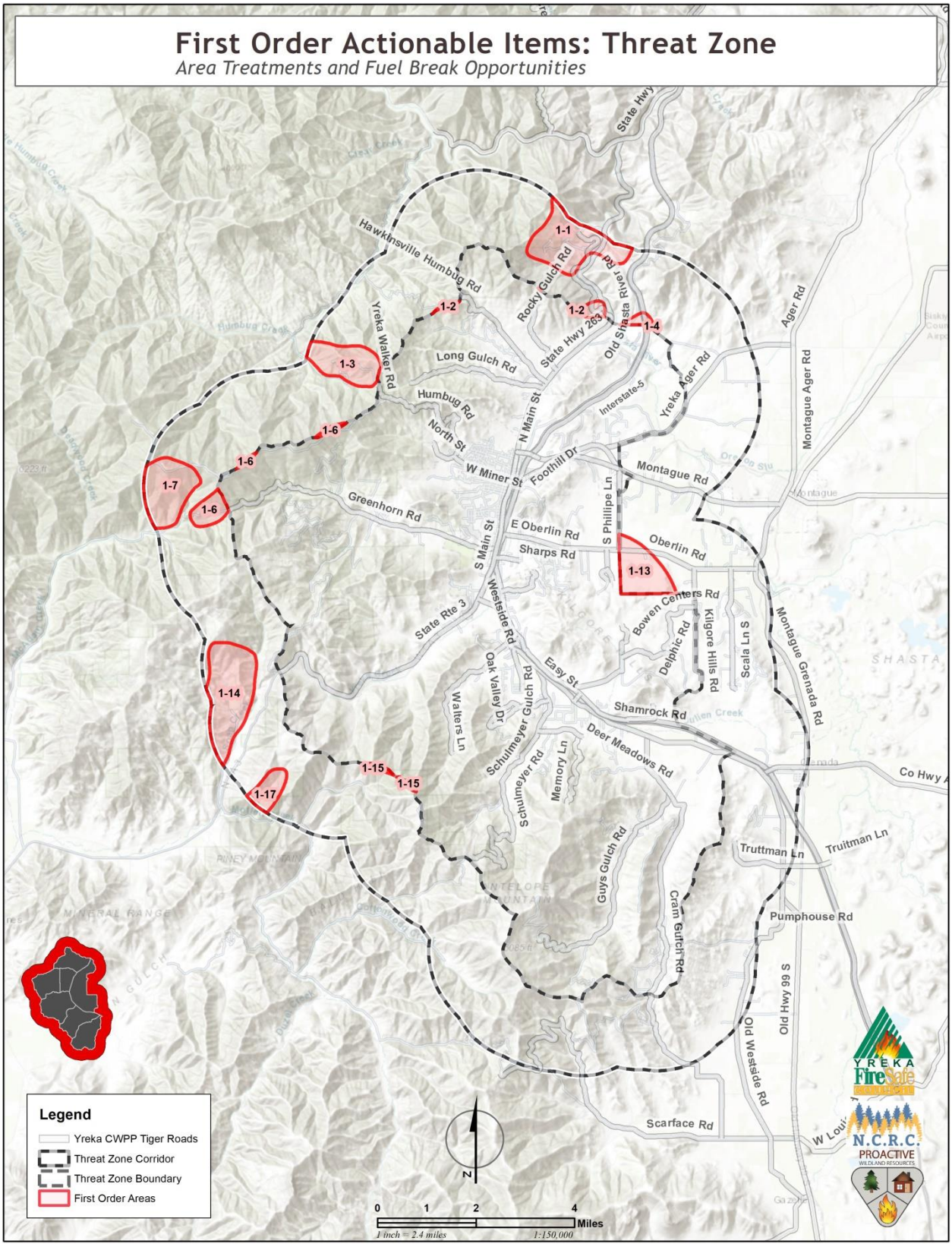
1. Roads/Infrastructure (areas detailed in Figure PA10.7)
2. Areas where structures are highlighted by red polygons
3. Landscapes/Ridgetops: Humbug, Greenhorn.

Figure PA10.7. *Structures Potentially at Risk and Primary Arterial Roads of Concern*



Structures Potentially at Risk		
	Late Season Only	**Early and Late Season**
No. of Structures	281	184

Figure PA10.8. *Priority Areas for Hazardous Fuels Mitigation*



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PART III. APPENDICES

Appendix A. Actionable Items Supplement

Appendix B. References

Appendix C. Glossary

Appendix D. Additional Wildfire Analysis Products

Appendix A: Actionable Items Supplement

{Supplement to *Section 6. Action Plan*}

This appendix reinforces *Section 6.* by providing additional tools to organize and track Actionable Items to help Yreka PAs engage protection actions. An Actionable Items Tracking Template (Table A.1) is a tool that can be used for each PA to identify and track actions categorized into the three primary community protection emphasis areas noted below and can be modified to meet the objectives for an area. A Home Hardening Prioritization Checklist (Table A.2) is also included. An annual review is advised to adjust for potential funding opportunities and other community-based needs or requirements. A short summary of key items from *Section 6* follows.

I. WILDFIRE AWARENESS AND EDUCATION *[LIFE SAFETY]*

- **Awareness & Preparedness Educational Event**

  It is recommended to hold an annual wildfire preparedness event for the community with the goal of training and educating citizens on key actions to reduce the negative effects of a wildfire. This event could be scheduled on or around National Wildfire Community Preparedness Day which falls on the first Saturday in May. This event may be 'all-encompassing' event (include all PA Citizens) and/or done for individual PAs.

- **Pre-Emergency Family Protection Actions**

  Every homeowner should be prepared for wildfire emergencies. ***Taking the time to PLAN AHEAD – Can Save Lives***

  Five Safety Steps for wildfire or any other type disaster situation:

  1. Get alerts to know what to do.
  2. Make a plan to protect your people.
  3. Get to safety with things you need.
  4. Stay safe at home when you can't leave.
  5. Help friends and neighbors get ready.

II. HOME PREPAREDNESS *[HOME IGNITABILITY]*

- **Home Hardening Actions**

  Homeowners need to take the responsibility for improving fire-safety measures at their home. There are simple things like cleaning your gutters or mowing dead grass to the more complex like changing out siding or installing a new roof. Included in this appendix is a guide that expands upon concepts introduced in *Section 6* by providing detailed tools and actions to safeguard your home. Table A.1 provides a checklist and explanation of tasks that homeowners should undertake. Figure 30 in Section 6.2.2 displays structures at greatest risk. Initial steps in this assessment process are:

  1. Homeowners must assess their roofs, vents and vegetation adjacent to their structures.

2. Walk around of your property and determine what actions will better prepare your home.
3. Complete 30 foot and 100 foot clearing annually per PRC 4291. Use extra precautions to clear the first five feet from the structure clear of anything burnable.

➢ **Defensible Space Actions**

As noted and illustrated in *Section 6.2.2*, protecting a home from wildfire requires continual defensible space actions in THREE ZONES around the property. (These zones are also referred to as, Home Ignition Zones or HIZ's.) Table A.1 below is a checklist that can be printed and used by property owners for each structure or infrastructure element under their ownership.

- **ZONE 0 = THE EMBER-RESISTANT ZONE** | **0–5 feet**: The zone within 5 feet of your home has many different names (e.g., the noncombustible zone, the immediate zone, the zero zone), but the objective is generally the same—to reduce the vulnerability of the home to embers by creating a zone of ember-resistant materials around the home. Gravel, a concrete or brick walkway, or another hardscape feature is commonly used to construct this zone. Tis ember-resistant zone should include the area under and around any attached deck. Be sure to keep this zone clean of any woodpiles, wood mulch, or flammable vegetation.

- **ZONE 1 = THE LEAN, CLEAN AND GREEN ZONE** | **5–30 feet**: The objective of this zone is to reduce the risk of fire spreading from surrounding vegetation to the home. Lean indicates that there is only a small amount of vegetation, if any, present. Vegetation should be grouped in discontinuous islands. Clean indicates that vegetative debris and dead materials are routinely removed. Green indicates that vegetation within this zone is kept green and well irrigated (if appropriate) during the fire season.

- **ZONE 2 = THE REDUCED FUEL ZONE** | **30–100 feet**: The objective of this zone is to reduce fire spread and restrict fire movement into the crowns of trees or shrubs. Remove dead plant material, lower tree branches and other ladder fuels (e.g., shrubs, lower branches, smaller trees). Locate outbuildings (e.g., for storage) at least 30 feet away from the home and create an ember-resistant zone around all outbuildings and propane tanks.

III. PRIORITY FUEL TREATMENTS *[HAZARDOUS FUELS TREATMENT]*

➢ **Major Access Routes – Highest Priority**

Primary roads identified as potential ingress and egress during evacuation or emergency response; should be top priority for fuels treatment. Safe access is crucial for first responders and citizens.

- The tracking table (A.1) will assist each PA in identifying and tracking the fuel treatments; roadside and treatment units.
- Treatment Prescription details are in *Section 6.*

➢ **Community Identified PA Priorities – Fuel Treatment Units**

Table A.1 displays priority fuels treatment areas that have hazardous fuels profiles that will be difficult to suppress throughout the fire season. These are the areas of first concerns. It also includes areas that have the highest likelihood of burning as determined through the Burn Probability analysis.

- Planning Area collaboration amongst citizens, interagency resources, and local non-profits that provide assistance in natural resource management will provide input to identify and prioritize types of treatments utilizing wildfire analysis tools provided in this plan.

Table A.2. Priority Areas for Hazardous Fuels Reduction Treatment

(These treatments could be either across the landscape or isolated through the development of Fuel Breaks)

Actionable Items: _____ Planning Area					
Priority Elements	**Number**	**Action**	**Responsible Official**	**Target Date**	**Status**
A. Wildfire Awareness-Education A challenge for all communities is how to generate interest and maximize awareness of the wildfire threat and encourage participation in preparing for a wildfire at an individual and community level. Public education is critical to community preparedness and citizens need to know.	A-1	EARLY MAY: Provide community and/or homeowner/neighborhood training classes on wildfire awareness & preparedness	Fire Department, CAL FIRE, County Fire Chiefs Assoc. & FSC		We will work with the City and area citizens to determine the responsible official and target dates. This form can be used to do annual tracking of accomplishments.
	A-2	Create online You Tube videos to educate residents on defensible space, fire safe landscaping, home hardening, evacuation, and wildfire preparedness. Utilize local residents and homeowner associations to develop content and provide local faces.	Fire Department, CAL FIRE, County Fire Chiefs Assoc. & FSC		
	A-3	Make widely available programs that bridge language barriers as well as help vulnerable populations; (ie) LISTOS	Fire Department, CAL FIRE, County Fire Chiefs Assoc. & FSC		

B. Home Hardening Preparedness Structures within the WUI Fire Areas built prior to 2008 WUI building construction standards are vulnerable to loss from wildfire. The cost of retrofitting existing structures with wildfire safety improvements can be significant, but retrofitting structures combined with adequate defensible space will make a difference in whether a structure survives a wildfire.	B-1	Work with City Building officials, County Fire Departments, CALFIRE to develop and adopt building standards that will increase structure resiliency.	Fire Department, CAL FIRE, FSC help		
	B-2	Seek grant funding opportunities that may be available to property-owners to help retrofit existing non-conforming structures to current WUI building construction standards.			
	B-3	Develop a voluntary home or community inspection program to provide property-owners with specific information on how they can address the specific structure hardening needs of their homes.			
C. Improve Defensible Space Defensible Space, Home Ignition Zone concepts are the key to Reducing Structure Ignitability. All homes need to comply with California Public Resource Code (PRC) 4291/Defensible Space guidelines at a minimum. When applied to the community these will increase structure survivability. Work to implement a fire safe landscaping review process for new and existing developments.	C-1	Within designated Wildland Urban Interface adopt and enforce California PRC 4291 requirements for defensible space. Develop an inspection program that focuses on property-owner education	Fire Department, CAL FIRE, FSC help		
	C-2	Work with CAL FIRE to develop a program or process to improve enforcement of defensible space requirements on SRA lands surrounding the City's WUI Fire Area.	Fire Department, CAL FIRE, FSC		

D. Hazardous Fuel Treatments: Ingress-Egress Routes Fuel treatments adjacent to roads can reduce fire behavior along important travel routes. Utilize evacuation route fuel treatment prescriptive guidelines to treat the following priority roads: • *A (Specific Road Names)* • *B* • *C* • *D* • *E* • *F* • *G* • *H* • *I* • *J*	D-1	Identify parcel-owners along primary evacuation routes and establish agreements with landowners to perform fuel reduction	Fire Department – GIS helper	Ongoing	
	D-2	Identify a Project Leader for working with homeowners in the area	Neighborhood or Community members		
	D-3	Work with FSC/NCRC/Local FD to seek funding	Project Ldr & Local Fire Dept		
	D-4	Establish equipment needed and schedule out rental or contract use for implementation and timing			
E. Hazardous Fuel Treatments: Fuel Treatment Units	E-1	Identify & prioritize areas based on the highest hazard areas per map tools (in each PA)	Fire Department and/or YAFSC		
	E-2	Work with Fire Agency personnel for advice on treatment design standards	Fire Department and/or YAFSC		

Table A.2. *Home Hardening Prioritization Checklist*

From the Winter 2021 Edition: Forestland Steward, University California Cooperative Extension		
Priority	**Location**	**Purpose**
1	**Roof**	Your roof is the most vulnerable part of your house to ember wash. Regularly inspect, maintain, and clean your roof. Make sure to block spaces between roof decking and covering to prevent embers from catching. Clean gutters and consider installing metal gutter guards. When it is time to upgrade, make sure your new roof meets Class A standards.
1	**Vents**	Vents allow for critical air circulation in a building; however, they can be penetrated by embers and ignite content within the home, especially through roof or under-eave vents. Upgrade existing 1/4-inch vent screens to 1/16-inch or 1/8- inch metal mesh or install the new flame and ember resistant vents. As a temporary strategy, prior to wildfire evacuation, cover vents with plywood or metal tape.
1	**Vegetation**	Start with the house and work outwards. Remove or relocate combustible plants and mulch within the first five feet of the home and attached decks or stairs. Providing this buffer around the home reduces the potential for ember ignition in this zone and protects the siding and windows from flame contact. Grouping plants into islands in Zone 1 (5-30 feet around the home) will reduce the potential for flames to burn directly to the home.
2	**Decks**	Remove debris that accumulates on or in between deck board gaps. Do not store combustible materials under the deck. Outdoor furniture, door mats, brooms, umbrellas, and plants should all be relocated in the event of an oncoming wildfire. Decks that overhang slopes are particularly vulnerable and increased defensible space is highly recommended. For new deck installation, when non-fire-retardant treated wood is used, increase the gap to 1/4-inch between deck boards and joist spacing. Apply foil-faced self-adhering flashing tape on the top of each joist.
3	**Windows**	Remove vegetation immediately outside of the windows. Where radiant heat exposures are possible, install or upgrade to multi-pane tempered glass windows. If the window is within 30 feet of a neighboring home or structure, consider installing noncombustible shutters to close upon evacuation or cover windows with temporary plywood.
4	**Eaves**	Inspect eaves for gaps around rafter roof tails and blocking. Make sure to plug or caulk gaps. If possible, replace open-eave designs with soffited-eaves and upgrade your vents.
5	**Siding**	In addition to a 5 foot noncombustible horizontal zone, maintain a 6-inch noncombustible vertical zone between the ground and the start of the siding. Inspect all siding and plug or caulk existing gaps and joints. If another house or structure is within 30 feet, consider replacing your siding with noncombustible or ignition-resistant materials. Gel coatings are not recommended because they are difficult to install and only provide a limited amount of protection time.

Appendix B: References

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Appendix C. Glossary

The glossary defines terms or words found in or relating to this plan. For additional terms an online resource is available at the National Wildfire Coordinating Group website.

Aspect	Cardinal direction toward which 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).
Climate	The prevalent or characteristic meteorological conditions of any place or region, and their extremes.
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.
Drought	A period of relatively long duration with substantially below-normal precipitation, usually occurring over a large area.
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 Environment	The surrounding conditions, influences, and modifying forces of topography, fuel, and weather that determine fire behavior.
Fire Frequency	Temporal fire occurrence described as a number of fires occurring within a defined area within a given time period.
Fire Hazard	A fuel complex, defined by volume, type condition, arrangement, and location, that determines the degree of ease of ignition and of resistance to control.
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 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 Continuity	The degree or extent of continuous or uninterrupted distribution of fuel particles in a fuel bed thus affecting a fire's ability to sustain combustion and spread. This applies to aerial fuels as well as surface fuels.
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 Rank	Live and dead vegetative fuels ranked for their capacity to support high-intensity fire *(source: California's Forests and Rangelands: 2017 ASSESSMENT (Chapter 4: Wildfire))*
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.
Home Ignition Zone (HIZ)	The area where the factors that principally determine home ignition potential during extreme wildfire behavior are present. The characteristics of a home and its immediate surroundings within 100 feet comprise the HIZ.
Initial Attack (IA)	An aggressive action to put the fire out by the first resources to arrive, consistent with firefighter and public safety and values to be protected.
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	A wildland fire originating from a planned ignition in accordance with applicable laws, policies, and regulations to meet specific objectives.
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.

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.
Shrub	A woody perennial plant differing from a perennial herb by its persistent and woody stem; and from a tree by its low stature and habit of branching from the base.
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.
Structure	A constructed object, usually a free-standing building above ground.
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	The elements of a community or natural area considered valuable by an individual or community that could be negatively impacted by a wildfire or wildfire operations.
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.

Appendix D. Additional Wildfire Analysis Products

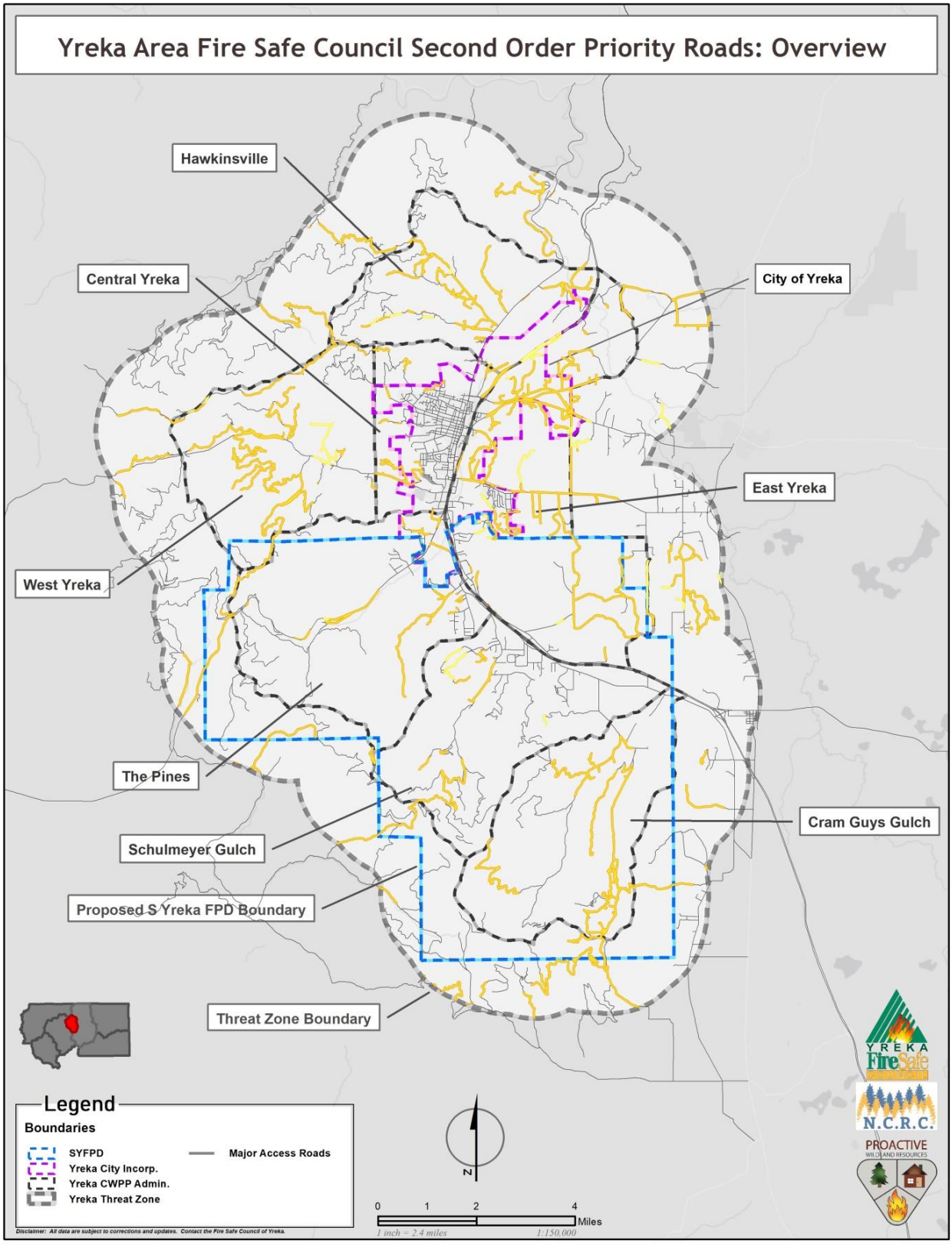
The multi-step wildfire modeling work in this CWPP produced an extensive array of maps and tables to assist every neighborhood across Yreka Area for the purpose of identifying and prioritizing wildfire protection and mitigation actions. Section 5 of the plan displays modeling results in maps for each step of the analysis. Appendix 6 displays the priority projects for consideration during the near horizon of the CWPP. Each Planning Area write-up in Part 2 has Planning Area specific maps of the primary projects.

This Appendix contains additional model outcome map products which supplement those in the plan, providing further detail or further geographical area. The polygons displayed below represent areas highlighted during the analysis of priority areas to work yet did not surface as number 1. These projects are ALL important but strategical the focus was to treat those areas at greatest risk in the near term.

Figure D.1 displays the remainder of the roads identified through the prioritization process. The identified road segments are impacted by areas modeled to be moderately difficult to suppress through those areas that would be impossible to suppress.

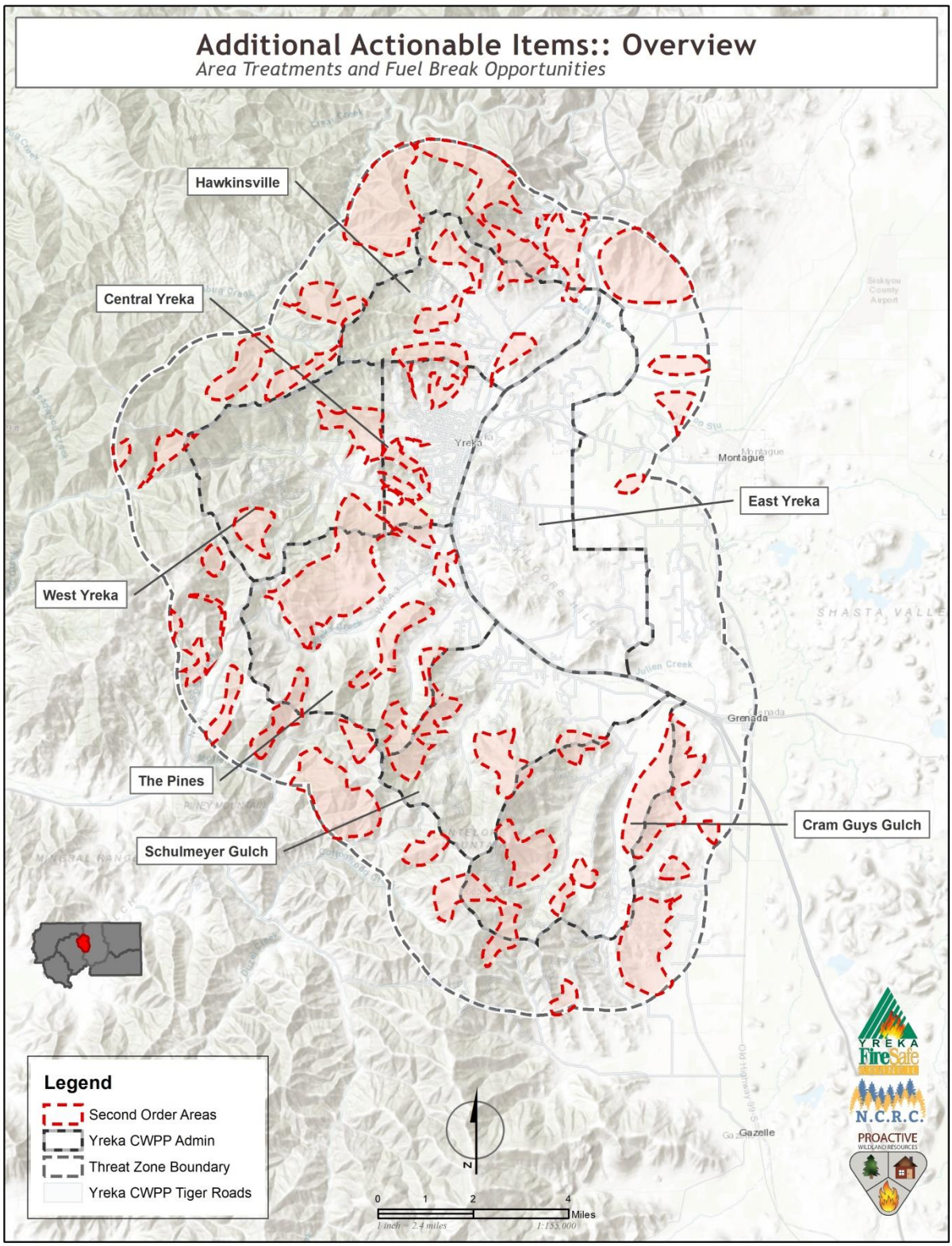
Figure D.2 identifies the remainder of the landscapes that are primarily problematic during the latter part of the fire season only.

Figure D.1. *Second Order Priority Roads*



Note: Access roads identified that traverse an area that was modeled as mostly difficult to suppress in fire modeling analysis.

Figure D.2. *Second Order Actionable Items*



Note: Areas that displayed suppression difficulty during late fire season only. These are areas that could be considered once the primary areas have actions to mitigate the hazardous fuels.

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.

Yreka Area Community Wildfire Protection Plan | Project Team Members

Jay Perkins: Wildland Fire Analysis
Julie Thrupp Titus: Wildland Fire/Fuels
Kelvin Clark: GIS Specialist
Sue Constantinides: Editor