Eagle River

Fire Protection District

Community Wildfire Protection Plan

ANCHOR POINT
WILDLAND FIRE SOLUTIONS

2011

ERFPD

Community Wildfire Protection Plan

Prepared by
Anchor Point
Boulder, CO
December, 2011

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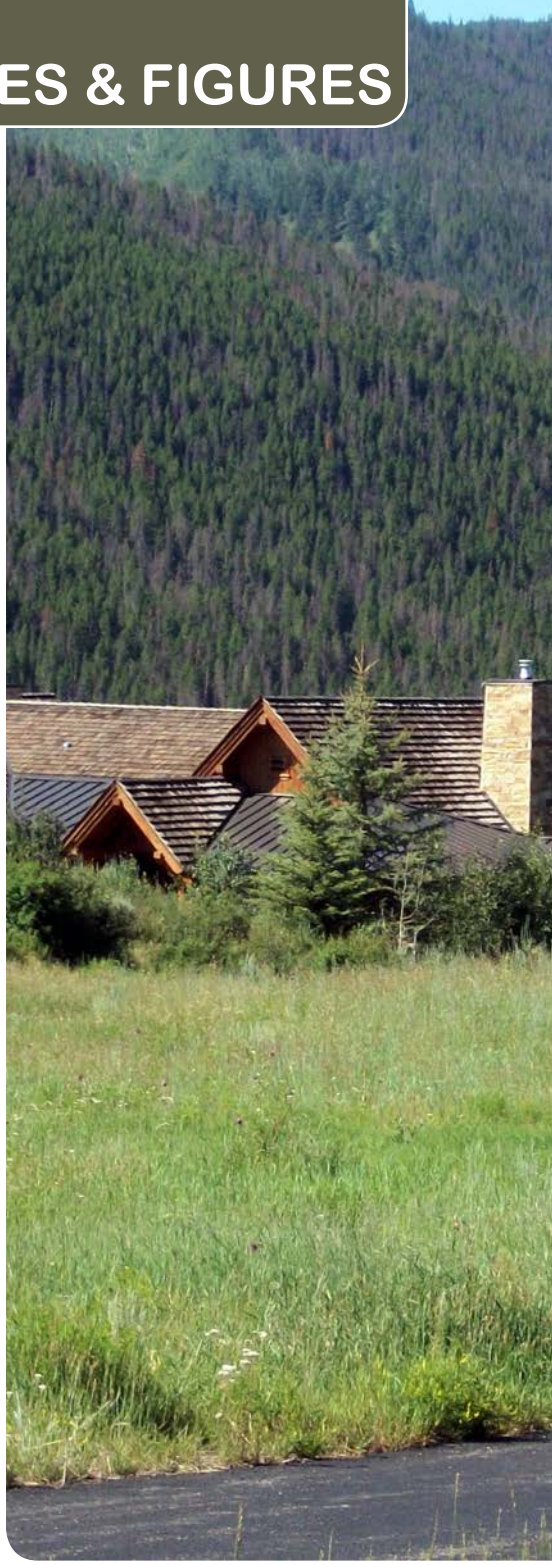
WILDLAND FIRE SOLUTIONS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF FIGURES

LIST OF TABLES



Executive Summary

The Eagle River Fire Protection District Community Wildfire Protection Plan (CWPP) is the result of a community-wide planning effort that included extensive field data gathering, compilation of existing documents and geographic information system (GIS) data, and scientific analyses and recommendations designed to reduce the threat of wildfire-related damages to values at risk. Values at risk include people, property, ecological elements, and other human and intrinsic values within the project area. Values at risk are identified by inhabitants as important to the way of life in the study area, and are particularly susceptible to damage from wildfire.

This document incorporates new and existing information relating to wildfire, which will be valuable to citizens, policy makers, and public agencies throughout central Eagle County, Colorado. Participants in this project include the Eagle River Fire Protection District (ERFPD), United States Forest Service (USFS), Colorado State Forest Service (CSFS), Eagle County officials, Eagle River Water and Sanitation District (ERWSD), Eagle River Watershed Council, and interested landowners.

The assessment portion of this document estimates the hazards and risks associated with wildland fire in proximity to Wildland-Urban Interface (WUI) areas. This information, in conjunction with identification of the values at risk (page 6), defines areas of special interest (ASI) and allows for prioritization of mitigation efforts. From the analysis of this data, solutions and mitigation recommendations are offered that will aid homeowners, land managers, and other interested parties in developing short-term and long-term planning efforts.

1. This document provides a comprehensive analysis of wildfire-related hazards and risks in the WUI areas covered by the ERFPD. The WUI is the area where human development and activity meets and intermixes with undeveloped, “wild” vegetation. The analysis is delivered in the form of a CWPP. It strives to follow the standards for CWPPs that have been established by the Healthy Forests Restoration Act (HFRA) and to meet or exceed the minimum standards established by the CSFS.

2. Using the results of the analysis, recommendations have been generated that aid stakeholders in preventing and/or reducing the threat of wildfire to values in the study area. These recommendations are included throughout the report, wherever appropriate.

3. These recommendations, which include defensible space and fuels treatments, will facilitate the implementation of future mitigation efforts.

4. This report complements local agreements and existing plans for wildfire protection to aid in implementing a seamless, coordinated effort in determining appropriate fire management actions in the study area.

The ERFPD CWPP is a living document, and, as such, will need to be updated annually, and/or after a major “event,” such as wildfire, flood, insect infestation, or even significant new home development.

How to Use This Document

The main CWPP document provides pertinent information for both the study area as a whole and for individual communities. A general overview of the CWPP process is provided first, followed by information more specific to the ERFPD area. This includes an analysis of fire department capabilities and specific community write-ups. Each set of community write-up pages can be regarded as a separate and complete report, and can be delivered to a community independently of the overall document. Community and ASI recommendations in each report address five broad categories: public education; structural ignitability/ defensible space; water supply; access/evacuation; and street and home addressing. Although many of the recommendations are general in nature, specific recommendations regarding landscape-scale fuels treatments are in the Community Analysis and Recommendations section of the report. With this format, each community has all the relevant information available in four pages, separate from the overall document. Combined with general recommendations in Appendix A, "General Recommendations," an individual or community should have the information necessary to begin the fire-mitigation process. Because much of the information contained in the report is extensive and/or technical in nature, detailed discussions of certain elements are contained in appendices:

Appendix A: General Recommendations
Appendix A provides further detail on recommendations. General defensible space guidelines, which are applicable for every property, are described at length. Eagle County Wildfire Regulations, home construction, preparedness planning, infrastructure, public education, water supply and recommendations are also found in this appendix.

Appendix B: Project Collaboration
One of the main requirements of HFRA is to ensure community participation. A summary of the collaborative process undertaken for this project are found in Appendix B.

Appendix C: Fire Behavior Technical Reference
Appendix C describes the methodology used to evaluate the threat represented by physical hazards such as fuel, weather and topography to values at risk in the study area, by modeling their effects on fire behavior potential.

Appendix D: Guiding Documents
This document is designed to meet or exceed the standards that have been established for CWPPs by both the HFRA and the CSFS. A summary of the two guidelines are found in Appendix D.

Appendix E: Fire Operations Guidance
There are a number of unique hazards to the ERFPD. Appendix E includes information on fire suppression in areas of beetle-killed trees and where unexploded ordinance (UXO) is present. This section also includes historical fire information for the ERFPD district area.

Goals & Objectives

GOALS FOR THIS PROJECT INCLUDE THE FOLLOWING:

- Enhance life safety for residents and responders.
- Mitigate undesirable fire outcomes for property and infrastructure.
- Identify communities at risk and values at risk.
    - Reduce fuel hazards and prevent fires in these communities.
        - Consider fuels treatment prescriptions and locations.
        - Continue fuels treatment projects already initiated.
- Mitigate undesirable fire outcomes for the environment, watersheds, and quality of life.
- Improve the district's position as it competes for grants.

To accomplish these goals, the following objectives have been identified:

- Establish an approximate level of risk (the likelihood of a significant wildfire event in the study area).
- Provide a scientific analysis of the fire behavior potential of the study area.
- Group values at risk into areas that represent relatively similar hazard factors.
- Identify and quantify factors that limit (mitigate) undesirable fire effects on the values at risk (hazard levels).
- Recommend specific actions that will reduce hazards to the values at risk.

OTHER DESIRED OUTCOMES

1. **Promote community awareness:**
   Quantifying the community's hazards and risk from wildfire will facilitate public awareness and assist in creating public action to mitigate the defined hazards.

2. **Improve wildfire prevention through education:**
   Community awareness, combined with education, will help reduce the risk of unplanned human ignitions. This type of education can also limit injury, property loss, and even unnecessary death.

3. **Facilitate and prioritize appropriate hazardous fuels reduction projects:**
   Organizing and prioritizing hazard mitigation actions will provide stakeholders with the tools and knowledge to evaluate these projects, ensuring that they are valuable and viable for the local community.

4. **Promote improved levels of response:**
   The identification of specific community planning areas and their associated hazard and risk rating will improve the focus and accuracy of preplanning and facilitate the implementation of cross-boundary, multijurisdictional projects.

Collaboration: Local Agencies

INITIAL CWPP DEVELOPMENT TEAM

The names of the initial representatives involved in the development of the ERFPD CWPP are included in the table below, along with their organizations and their various roles and responsibilities. For a more in-depth list of stakeholder involvement and information on the collaborative process, see Appendix B.

Name	Organization	Roles / Responsibilities
Karl Bauer, Acting Chief **Jodi Pratt**, Wildland Team Prevention Coordinator	**Eagle River Fire Protection District**	Initiate stakeholder group; serve as point of contact during the CWPP process; provide local information and expertise, including community risk and value assessment; develop community protection priorities.
Paul Cada, Assistant District Forester	**Colorado State Forest Service**	Initiate stakeholder group; serve as point of contact during the CWPP process; approve CWPP minimum standards; provide agency treatment information.
Ross Wilmore, Fire Management Officer	**U.S. Forest Service**	Serve as point of contact during the CWPP process; approve CWPP minimum standards; provide agency treatment information; assist with area fire behavior modeling.
Eric Lovgren, Wildfire Mitigation Manager	**Eagle County**	Serve as point of contact during the CWPP process; provide local information and expertise, including community risk and value assessment; develop community protection priorities.
Chris White, Urban Interface Specialist **Rod Moraga**, Fire Behavior Analyst **Kerry Webster**, WUI Program Specialist **Matt Lloyd**, Wildfire Specialist/Forester **Mark McLean**, GIS Project Manager	**Anchor Point**	Develop the CWPP; make decisions, assess community risk and value; develop community protection priorities; establish fuels and general wildfire mitigation recommendations.

Table 1. Initial CWPP development team.

Study Area Overview

STUDY AREA OVERVIEW

Long before the arrival of European settlers, the Ute Indians used the Eagle River Valley as their summer hunting and fishing grounds. In 1840, Kit Carson and the Fremont party traveled through the region, bringing behind them prospectors and settlers looking for new opportunities. In 1879, the first permanent camp in Eagle County was established at the town of Red Cliff, which later became the county seat in 1883. Further settlement continued, and additional towns down the valley were later incorporated in the late 1800s and early 1900s. In 2000, the ERFPD was established, which includes the towns of Avon, Arrowhead, Bachelor Gulch, Beaver Creek, Cordillera, Eagle-Vail, Edwards, Minturn, Red Cliff, and Wolcott. The ERFPD currently serves 240 square miles of central and eastern Eagle County.

Today, the area is a popular tourist destination and place to reside. Rapid development throughout the study area has occurred over the past 30 years, as new homes and businesses have been built to accommodate population growth. Popular destinations in the area include the White River National Forest, the Beaver Creek and Vail ski resorts, a number of local golf courses, and a variety of shopping and dining opportunities.

For the purposes of this project, 21 new communities were identified directly within the ERFPD, in addition to those communities that have already prepared CWPPs. Existing communities with CWPPs, which contain updated write-ups, include Arrowhead, Bachelor Gulch, Beaver Creek, and Cordillera. All of these communities represent the most densely populated regions of the study area. Each community exhibits certain dominant hazards from a wildfire perspective. Fuels, topography, structural flammability, availability of water for fire suppression, egress and navigational difficulties, as well as other hazards both natural and artificial, are considered in the overall hazard ranking of these communities. Construction type, condition, age, the fuel loading of the structure/contents, and position are contributing factors to a home's susceptibility to ignition under even moderate burning conditions. Some areas also exhibit the potential for rapid fire growth and spread due to steep topography, fast-burning or flashy fuel components, and/or other topographic features that contribute to channeling winds and promoting extreme fire behavior.

The community-level assessment for the entire study area has identified all of the communities in the study area to be at high or very high risk. In these communities, a parcel-level analysis should be implemented as soon as possible to ensure the ongoing safety of residents and survivability of structures. Please refer to the graphics on the following pages for a color-coded hazard ranking reference.

In addition to the communities, three ASIs and four historical structures have been identified: Beaver Creek Ski Resort, Camp Hale, Gilman, and Brett Ranch Cemetery, Edwards Cemetery, Holy Cross City, and Red Cliff Cemetery, respectively. Although these areas may or may not include residences, they contain critical infrastructure, buildings, and/or other structures that necessitate serious attention for fire mitigation.

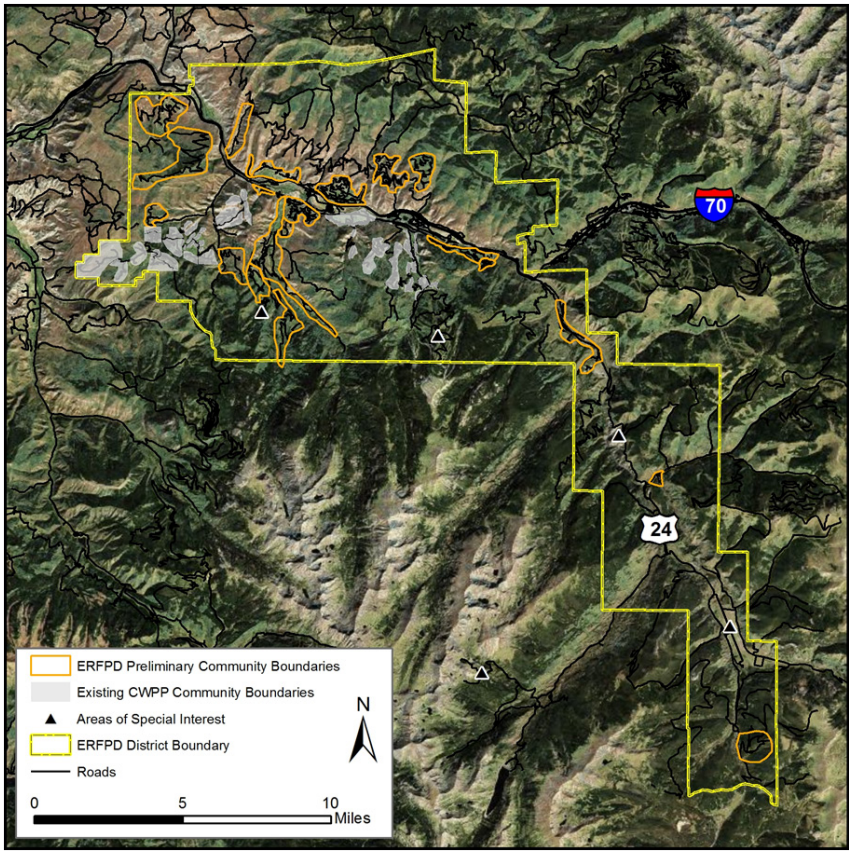


Figure 1. Overview of communities within the Eagle River Fire Protection District.

DEFINING THE WILDLAND URBAN INTERFACE

For the purpose of this CWPP, the WUI in the ERFPD was defined using a 0.5 mile buffer surrounding the fire protection district boundary.

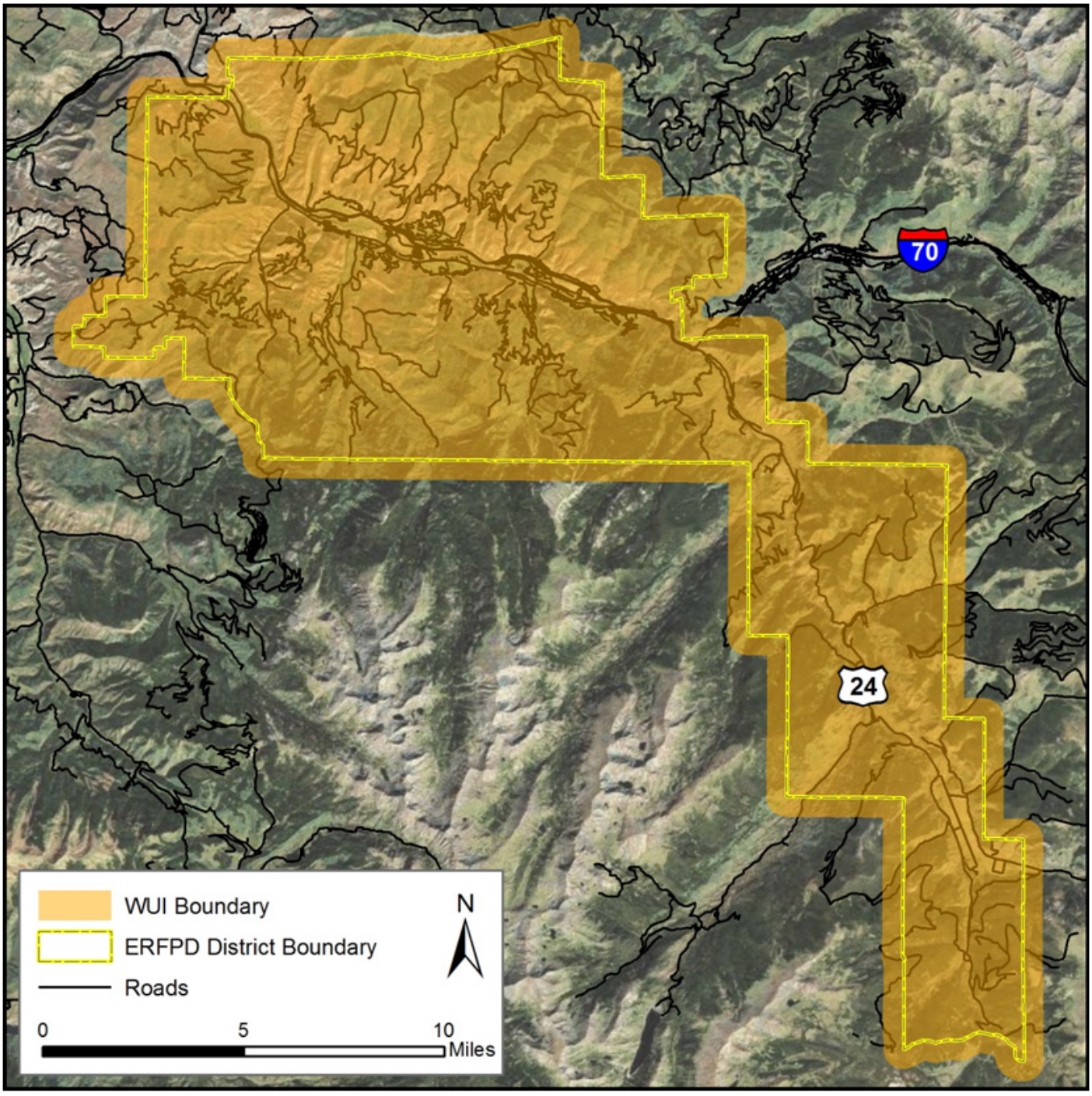


Figure 2. The defined WUI includes a 1/2 mile extending from the ERFPD boundary.

Values at Risk

LIFE SAFETY AND HOMES

The ERFPD study area encompasses a number of towns, unincorporated Eagle County communities, subdivisions, and small ranches. Most of these areas are at some risk for wildfire, and many have a high to very high wildfire risk. Moreover, as the available land for additional development has decreased, building in remote mountain areas with difficult access has become a growing concern.

Lot sizes throughout the study area vary widely. Outside of the individual towns and unincorporated communities, lot sizes are generally large, aside from a few scattered subdivisions. Lots within and adjacent to towns and communities are small, and this higher density could make an evacuation of the area more problematic. The risk for wildfire in these areas stems from several different sources, including individuals recreating in adjacent federal lands; structure fires transitioning into the wildlands surrounding homes; seasonal burning; and natural causes, such as lightning.

COMMERCE AND INFRASTRUCTURE

Economic Values

The study area has a highly tourism-based and seasonal economy. Jobs in the retail and service sector dominate the workforce, with ski areas being among the largest area employers. Other large employers include local and county government agencies, education centers, Vail Valley Medical Center, hotels, retail stores, and restaurants. All tourism-based businesses could be severely affected by an adjacent, large wildfire due to public perceptions about safety and potential impacts from smoke and road closures. These businesses could also remain negatively impacted after the fire. Tourists could assume that the aesthetics of the area have been impacted, that they might be threatened by another area fire, or that the area is unsafe to visit. A public relations effort should be considered following any large fire to ensure that these impacts are minimized.

Critical Infrastructure

The ERFPD study area has a mix of private and public lands. Aside from the obvious negative impacts to tourism by wildfire, there is additional infrastructure within the study area that could be adversely affected. The Interstate 70 corridor could be affected by smoke produced by a large wildfire. Road closure, for example, would cut off the main west-east route between Denver and western Colorado. Area reservoirs serve as sources of drinking water; ash and associated runoff from a wildfire could reduce water quality. Other important infrastructure includes an abundance and wide distribution of power lines, transportation systems such as railways and highways, and vital communication towers. The impact of wildfire to infrastructure within the study area must be a consideration for wildfire prevention and planning. Additional infrastructure information is located in the Areas of Special Interest and Critical Infrastructure section located on **page 116.**

ENVIRONMENTAL RESOURCES

Natural Resources, Including Watersheds and Rivers

The study area lies entirely within the 944-square-mile Eagle River Watershed, which is part of the larger Upper Colorado River Basin. The Eagle River originates in the high mountains along the border of southeastern Eagle County, and it flows westward before dumping into the Colorado River near Dotsero. Principal tributaries of the Eagle River include Beaver Creek, Brush Creek, Cross Creek, Gore Creek, Gypsum Creek, and Turkey Creek. In the upper reaches of the watershed, annual average precipitation is around 28 inches, while it ranges from 12 inches to 19 inches at lower elevations. Approximately 75 percent of the annual river runoff comes from high elevation snowmelt, meaning that discharge varies widely between years, depending on snowpack depth and sustained air temperatures.[1] Water sourced from the Eagle River Watershed and Upper Colorado River Basin supplies millions of end users, from local towns, farms, and mining operations to Front Range communities and neighboring states. Within the watershed area, there are 27 different public water drinking systems, six of which are surface-water systems, which supply water to a population of more than 60,000 people. In order to protect water quality, it is vital to minimize impacts upstream that could affect downstream and local users. Wildfires can cause substantial erosion and sediment deposit, thereby impacting aquatic and terrestrial life and/or clogging filters at water-treatment plants, and, thus, potentially impacts water quality.[2]

Natural resources potentially at risk for wildfire in the study area include wetlands and riparian areas, a number of threatened and endangered species, and imperiled native plant communities.

1 Northwest Colorado Council of Governments. “2002 Eagle River Water Quality Management Plan.” October, 12, 2002.
2 Colorado State University for the Eagle River Watershed Council. “Eagle River Inventory and Assessment.” August 2005.

Wildfire can have damaging impacts to plant and animal life by fragmenting and reducing habitat. Reduced habitat decreases foraging area and limits protection for ground animals, thereby increasing predator pressures. Several state and federally listed threatened species and species of concern are found within the study area, including lynx *(Felis canadensis)* and the boreal toad (*Bufo boreas boreas)*.[3]

Vegetation present in wetlands and riparian areas of the watershed provide valuable habitat for mammals, fishes, amphibians, reptiles, and birds. Moreover, these areas provide vital cover and conduits for the migration of many different species. Currently, four federally listed threatened fish species are found within the watershed area, including the Colorado River cutthroat trout (*Oncorrhynchus clarki pleuriticus*). Indirect impacts to watershed ecosystems associated with wildfire include the use of retardant that changes water chemistry, soil damage/compaction from fire apparatus, and post-fire runoff of chemicals and sediment. Acting to prevent wildfire in these areas and taking special care when a fire occurs are critical measures for maintaining biodiversity and ecosystem function.[4]

3 CO Division of Wildlife. http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern. Accessed on March 20, 2011.
4 US Geological Survey. “Water Quality in the Upper Colorado River Basin.” USGS Circular 1213. 1998.

Current Risk Situation

The surrounding federal lands report an active, but far from extreme, fire history. Fire occurrences for the Holy Cross Ranger District of the White River National Forest were calculated from the U.S. Forest Service Personal Computer Historical Archive for the 40-year period from 1970-2010.

HOLY CROSS RANGER DISTRCT (USFS)

Figure 4 shows USFS fire statistics for the Holy Cross Ranger District. The figure on the upper left shows the number of fires (red bars) and the total acres burned (blue hatched bars) in the Holy Cross Ranger District for each year. The number of annual fires ranges from zero to 30 fires per year, with an average of seven. Between 1970 and 2010 only four fires burned more than 100 acres in the ranger district. The total number of acres burned was the greatest in 1974, when two large fires accounted for approximately 873 acres burned. Other large fire years occurred in 1987 and 1991.

The figure in the upper right shows the percentage and number of fires occurring in each month of the year between 1970 and 2010. Historically, July has had the greatest number of fires, followed by August, September, and June. The fewest fires occurred between the months of November and April, a fact that reflects the seasonal conditions for the area. Autumn and winter fires within the ranger district have occurred infrequently. Fires outside the summer months are typically wind driven and can have rapid rates of spread.

The figure on the bottom left shows the size class distribution of fires. Table 2 offers an explanation of the size class figure. Approximately 95 percent of the reported fires were less than 10 acres in size. These statistics reflect the widely held opinion that, throughout the western United States, the vast majority of fires are controlled during initial attack.

The figure on the bottom middle shows the number of fires caused by each factor. Table 2 offers an explanation of the cause class figure. By far the most common cause of ignitions is campfires. This reflects the high level of recreationists who visit the area each year. Many campsites in the area are dispersed, and they lack a designated fire pit and area cleared of vegetation around the fire pit. Educating users of camping areas and increased monitoring will help to reduce this risk. The second most common cause of ignitions is lightning, followed by smoking and miscellaneous. All other causes are roughly equal, and although they are lower threats, they should also be taken into consideration.

Finally, the bottom right figure represents the number of starts for each day that a fire start was recorded. Nearly all fires (287) occurred on days with one start. Only 29 days had two starts per day, and no days had more than four starts.

EAGLE RIVER FIRE PROTECTION DISTRICT

In 2005 ERFPD began using the National Fire Incident Reporting System (NFIRS). This system is used by many fire departments use to maintain records in a uniform manner. To date, approximately 23,000 fire departments report in the NFIRS annually. The total number of fires may represent unattended campfires, dumpster fires, agricultural fires, and other fires occurring outdoors. The number of wildland fires more specifically refers to fires occurring in natural vegetation. The ignition source can be both natural (lightning) or human-caused. Additional, more detailed information on recent fires within the ERFPD can be found at the end of Appendix E.

Year	Total Fires	Wildland Fires	Total Acres Burned
2005	0	0	0
2006	57	0	7
2007	55	2	12
2008	70	3	3
2009	55	1	1
2010	55	2	2

Table 3. Summary table of wildland fires within the ERFPD reported to the NFIRS.

MOUNTAIN PINE BEETLE

A CWPP is not designed to be an ecosystem management plan, nor is it a plan dedicated to insect and disease issues. However, because of the intensity of the mountain pine beetle (MPB) (*Dendroctonus ponderosae* Hopkins) epidemic and the impact this could have on life safety and fire behavior, it is important to include it in this document.

The MPB has become a prominent forest pest in lodgepole pine stands on the west and east side of the Continental Divide in northern and Central Colorado. With over two million acres of trees impacted since 1996, the forests in Colorado are among those where trees have long since been attacked and killed. Trees are attacked by MPB during the summer months and into the early fall. By the following summer, successfully attacked trees will begin to fade. Lodgepole pine forests in the ERFPD

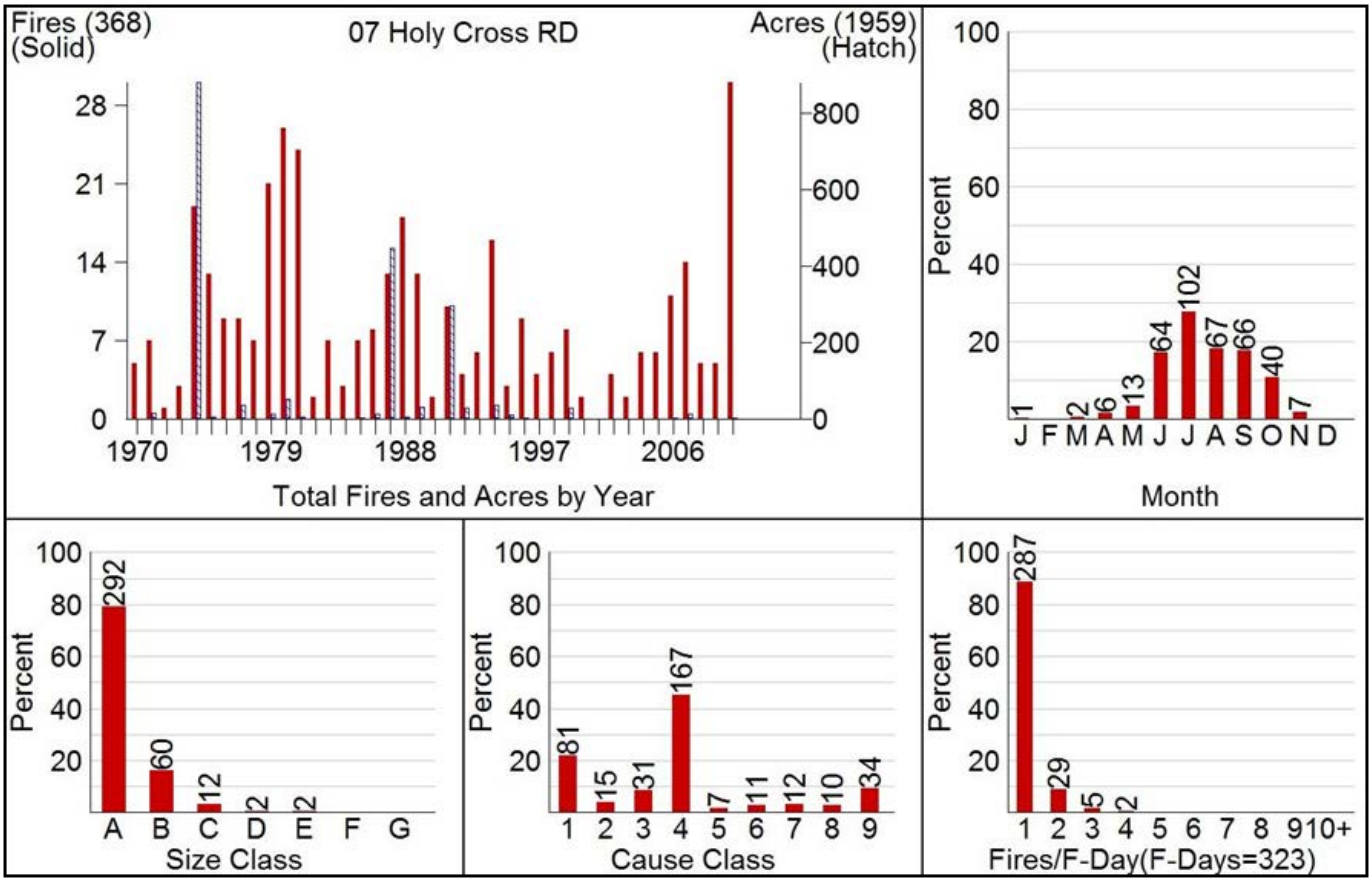


Figure 3. USFS Fire statistics (Holy Cross Ranger District).

Size Class (acres)	**A** <1/4	**B** 1/4-9	**C** 10-100	**D** 100-299	**E** 300-999	**F** 1000-4999	**G** 5000+		
Cause Class	**1** Lightning	**2** Equipment	**3** Smoking	**4** Campfire	**5** Debris Burning	**6** Railroad	**7** Arson	**8** Children	**9** Misc.

Table 2. Explanation of fire statistics in Figure 4.

Current Risk Situation

district were notably being attacked by 2005. Within a few years, large areas of mortality were present across the landscape. At present, while there are still trees in the 'red needle' phase, the majority of the lodgepole have lost their needles and are quickly approaching the 'gray phase.'

Typically, high elevation forests have infrequent fires due to climatic conditions that are not conducive to ignitions and/or large fire development. The combination of increased precipitation (rain and especially snow) and lower summer temperatures does not allow for the same drying impact on wildland vegetation as observed at lower elevations. The concern of large fires is primarily during drought years with low snowpack. The MPB trees are receptive to fire even in normal and above average moisture years. This increase in frequency and intensity is a significant impact to the communities and fire departments.

It is during the 'red needle' phase that the forest is at the greatest risk in the event of an ignition. The probability of having an ignition source (lightning or human caused) does not increase, but the probability of trees igniting does. The dry needles catch fire upwards of three times more readily than green needles. Fire may spread quickly through the crowns, especially during high wind events. Within 3-5 years, the needles will fall off of the trees. Crown fire risk is significantly diminished when the stand is in the grey phase because there are no needles in the crown to support active burning; however, the risk of intense surface fire increases due to an increase in understory plants and grass following the opening of the canopy and because of increased blowdown associated with rot in attacked trees and the shallow root system of the remaining living lodgepole pine. The combination of gusty winds and numerous recreational uses creates a dangerous situation, as trees could potentially fall on individuals or block access along roads used by the public, emergency responders and utility companies.[1]

At present time, the majority of the MPB outbreak is over, as the majority of the host trees have already been attacked. Instead, the best option is to remove hazard trees, especially in areas of high recreation use, near homes and infrastructure, and near roads. It should be noted that remaining live trees will still be susceptible to blowdown. With mortality rates reaching upwards of 90% in most stands, the future composition of the forests is unknown. Management should focus on hazard tree removal and practices that support regeneration.

For more information on the mountain pine beetle and how to stay safe in areas of beetle kill, please contact the Colorado State Forest Service or the USFS Holy Cross Ranger District. Other information is also available at:

http://csfs.colostate.edu/cowood/library/05_Beating_the_Blues.pdf

http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5195701.pdf

OTHER AGENCY TREATMENTS

The Colorado State Forest Service, the U.S. Forest Service, Eagle County, and local communities all have planned and completed fuel mitigation projects in the vicinity. A snapshot of most of these efforts is difficult to show at a large scale, so these treatments are found within the individual community graphics. All of the treatments shown have either been completed or are in progress. The proposed Anchor Point treatments are often tied into these existing agency projects or are in close proximity. Homeowners' associations and individuals should supplement these efforts with their own wildland fire mitigation treatments, which are detailed in the Community Analysis section.

1 Romme, W.H., J. Clement, J. Hicke, D. Kulakowski, L.H. MacDonald, T.L. Schoennagel, and T.T. Veblen (2006). Recent forest insect outbreaks and fire risk in Colorado forests: A brief synthesis of relevant research. Colorado Forest Research Institute, Report (refereed), 24 pp. Available as a PDF: http://www.cfri.colostate.edu/reports.htm

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Fire Behavior

The Eagle River Fire Protection District has had few wildland fires greater than 10 acres. Wildfires are not infrequent, though they are usually small. Under the right conditions (low relative humidity, high winds and temperatures, and drought) extreme fire behavior is possible, especially when combined with effects of the ongoing mountain pine beetle epidemic. Adding in the current infrastructure and home construction, the area has a high to very high risk from wildfire. If such an event were to happen, it is likely that the community would experience multiple structure losses. **For a more detailed look at fire behavior, see Appendix C.**

FUELS

The ERFPD is typical of montane and upper montane ecosystems. Vegetation ranges from grass and shrub meadows to dense high-elevation conifer forests. Lower-elevation areas along Interstate 70 and Highway 24 are primarily grass and sage, with scattered areas of other shrubs and juniper trees. These areas will exhibit rapid rates of spread, especially under high-wind events. Flame lengths in these areas are expected to generally be less than four feet, except in areas of dense juniper, which means that they are generally controllable by hand crews and wildland fire engines.

Moving higher up the valley and in more mesic areas, scattered aspen and Douglas fir stands intermix with the grass and shrub meadows. Aspen is not normally seen as a vegetation type at risk for fire, though stands have been known to burn under drought conditions. In the upper elevations of the study area, lodgepole pine, Engelmann spruce and subalpine fir stands dominate. Fire intervals in these areas are in the hundreds of years, and these areas are not normally at a high risk of active fire behavior unless persistent drought conditions align with low relative humidity and high winds. However, once a fire has started in these fuels, it can be very difficult to stop, as high winds and dense vegetation will allow active crown fire behavior to occur and spread rapidly.

This threat could be exacerbated by heavy accumulations of dead and downed trees following the mountain pine beetle epidemic. Although scientists and fire managers are not yet certain whether these fuels create a greater than normal threat, it should be assumed that suppression in these areas will nevertheless be more difficult and hazardous because of the abundance and location of these fuels sources. Although the possibility of active crown fire behavior will be reduced, the potential for surface fire could increase. As trees fall and the canopy opens, grasses, forbs, and seedlings will grow in the openings between trees. These fuels can spread fire to and among downed logs, creating the potential for hot-burning, fast-moving fires. Suppression under these conditions can be very difficult, and may require the use of heavy equipment and/or aerial fire resources. Firefighters in areas of large amounts of beetle-kill will need to constantly assess the fire behavior and weather conditions before beginning and continuing suppression actions. **More information can be found in Appendix A, in the Landscaping/Fuels section on page A10.**

WEATHER

The weather analysis for the area shows that few days will actively support large fire growth. Throughout the study area, average temperatures are comparatively low and the relative humidity is normally high. Thus, the daily window of opportunity for ignition is small. The season is also short with winter snows arriving early in the fall and lasting later into the spring, especially in the higher elevations of the study area. However, grass and sage areas along the valley bottoms normally dry out sooner and become more susceptible to an ignition later in the fall and earlier in the spring. In these areas, wildfire is possible throughout much of the year until sufficient snowfall occurs. The biggest weather concern is drought or low snowpack coupled with high winds. Generally, forests above 9,000 feet are wet and ignition resistant, but when there is prolonged drought, they are at a greater risk for fire.

High winds are the main cause of large fire events in the study area. The study area is surrounded by various mountain ranges and valleys that funnel and speed up winds from all directions. Stronger wind speeds of 10 to 15 mph are not uncommon year-round. The study area is also known for gusty winds, which can exceed 40 mph on a windy day. Many fuels, such as the large grass and sage meadows, will support active fire behavior only when fuels are sufficiently dried out, and especially during windy conditions. Moreover, strong, gusty winds can penetrate densely forested stands and transition the fire from the ground into the tree canopies.

TOPOGRAPHY

Elevation in the study area varies from about 7,100 feet along the Eagle River to over 11,000 feet near Tennessee Pass. Nearby peaks, including Mount of the Holy Cross, exceed 14,000 feet in height. Much of the area surrounding and throughout the fire protection district is mountainous with steep hillsides, narrow canyons, and drainages. These narrow, steep chutes will funnel winds and further increase the rate of spread of a fire. Many homes in the study area are located atop ridges, above chimneys, in steep drainages, or midslope. These regions are particularly at risk. Slopes in the study area are sometimes greater than 45 degrees, or 100 percent. At 30-percent slope, rate of fire spread doubles compared to rates at level ground. Firefighting effectiveness is greatly reduced in these areas as a result.[1]

The position on the slope where a fire starts can make a significant difference in how fast the fire spreads and grows. Steep slopes increase fire behavior as a result of preheating the uphill fuels. A fire originating on the top of the slope can have the most minimal fire behavior, because it backs down the hill with low-flame lengths and rates of spread. This is typically where lightning strikes and single tree ignitions occur but do not often spread. The biggest concern would be a fire starting at the base of the slope and then spreading quickly up the hill, especially under extreme weather conditions. Discarded cigarettes, overheated cars, vehicle accidents, and burning debris can act as ignition sources in these areas. A fire starting lower down in elevation could easily move up into and around the various communities in the study area, potentially threatening egress routes.

1 Dennis, Frank C. “Fuel Break Guidelines for Forested Subdivisions and Communities.” Colorado State Forest Service, 2005.

Local Preparedness & Fire Response Capabilities

OVERVIEW

ERFPD covers a 240-square-mile area in Eagle County. The primary communities served by the District include Avon, Arrowhead, Bachelor Gulch, Beaver Creek, Cordillera, Eagle-Vail, Minturn, Red Cliff, and Wolcott. In total nine fire stations are in the district, five of which are staffed 24 hours a day. Not including administrative personnel, there are 53 full-time firefighters. In addition, approximately 20 interns are a part of the residency program. Additional assistance is available through mutual aid agreements with Greater Eagle, Vail, and Gypsum fire departments, as well as support from the Upper Colorado River Interagency Fire Management Unit (UCR) and from adjacent counties.

The largest concern for ERFPD is that wildfire hazards and risks are increasing. Multi-acre fires demand a substantial commitment of resources, which could overwhelm local resources. The limits of the ERFPD could be reached or exceeded in any multi-acre fire burning in 100-hour fuels, by multiple ignitions exceeding two acres and/or fires requiring operations extending beyond two operational periods (24 hours). Additional mutual aid resources may be unable to respond immediately, have wildfires within their own district, or not have enough resources to commit to ERFPD.

Most of the communities in the study area are not greater than five miles away from a fire station; however, response times may vary greatly over the same distance because of road conditions, steepness, curvature, and evacuation traffic. In addition, not every station is staffed at all hours or with an apparatus that can be used for wildland firefighting. Figure 5 shows a distance analysis that calculates the drivable distance, not drive time. The graphic displays the drivable distance for the staffed stations within ERFPD.

QUALIFICATIONS AND TRAINING

In terms of wildland-fire training, every member of the ERFPD has completed S-130/S-190, the introductory fire course. This is not required for Battalion Chiefs and those with a higher rank, but several chiefs have taken the class. However, Battalion Chiefs will be required to take the class in 2012. Every person with S-130/S-190 eventually takes S-131, Advanced Firefighter Training. Lieutenants are required to take S-215, Fire Operations in the Wildland/Urban Interface and L-280, Followership to Leadership. Twelve individuals in ERFPD have chosen to specialize in wildland fire. As a result, they take on shifts utilizing wildland equipment in addition to their regular shift work.

All of the wildland fire training is paid for by ERFPD. Resident/intern firefighters learn the basics of wildland fire during fire academy. Some trainings are taught by the department, like S-131, Firefighter Type 1. Other classes on progressive hose lays, structure protection, communication, and water supply are not recognized by the National Wildfire Coordinating Group (NWCG). The department will start teaching L-280 in-house in the near future. The USFS provides an official NWCG S-215 class that department members take. All members are required to take the annual fire refresher course and pass the arduous pack test. This training is critical for maintaining certifications and the ability to fight wildland fires. As a combination of training and experience, firefighters have acquired a variety of qualifications, detailed in Table 4.

PERSONAL PROTECTIVE EQUIPMENT AND RADIOS

The department provides almost all of the necessary wildland personal protective equipment (PPE), including Nomex pants, shirts, packs, and New Generation fire shelters. Firefighters are responsible for providing their own wildland boots. Within the department, 800 MHz radios are used, and every individual on a shift is equipped with a handheld radio. Because the Forest Service still uses VHF radios, every engine has at least one Bendix King (BK) radio. Two BKs are on each wildland engine.

WILDLAND TEAM

The 2011 ERFPD Wildland Team is comprised of 12 members, although there is no limit for the number of people allowed. The team is initially available for any member of the department, but after the first year, a person is required to apply. There is an annual application to be a part of the wildland team. To be on the team, you must be a squad boss trainee (FFT1(t)).

Three team leaders specialize in operations, training, and prevention. Members of the wildland team are given the first chance to go out on national dispatches. If a team member is unable to take the dispatch, line personnel are given the next chance, and finally residents. Currently, four individuals are available for national dispatch as line emergency medical technicians (EMT), and five are available as a single, individual resource.

The team was initially designed as an experiment to determine its value to the district. Upon determining its importance, the district is currently planning on maintaining the team once it is funded, though it should not necessarily be considered an on-going program due to the current fiscal climate.

APPARATUS

Overall, ERFPD does not have a large number of apparatuses that have the primary role of responding to wildland fire.

There have not been many wildland fires within the district, so there is not the need for a large number of wildland-specific apparatuses. Type 1 engines are typically used for structure protection, while Type 3, 6, and 7 engines are used because they can access rougher terrain. Because of the utility of smaller vehicles, an additional Type 3 engine is currently being designed. The department has a Colorado Interagency Cooperative Fire Protection Agreement for all wildland apparatus and Type 1 engines. Table 5, below, includes a summary of apparatuses and staffing at each ERFPD fire station.

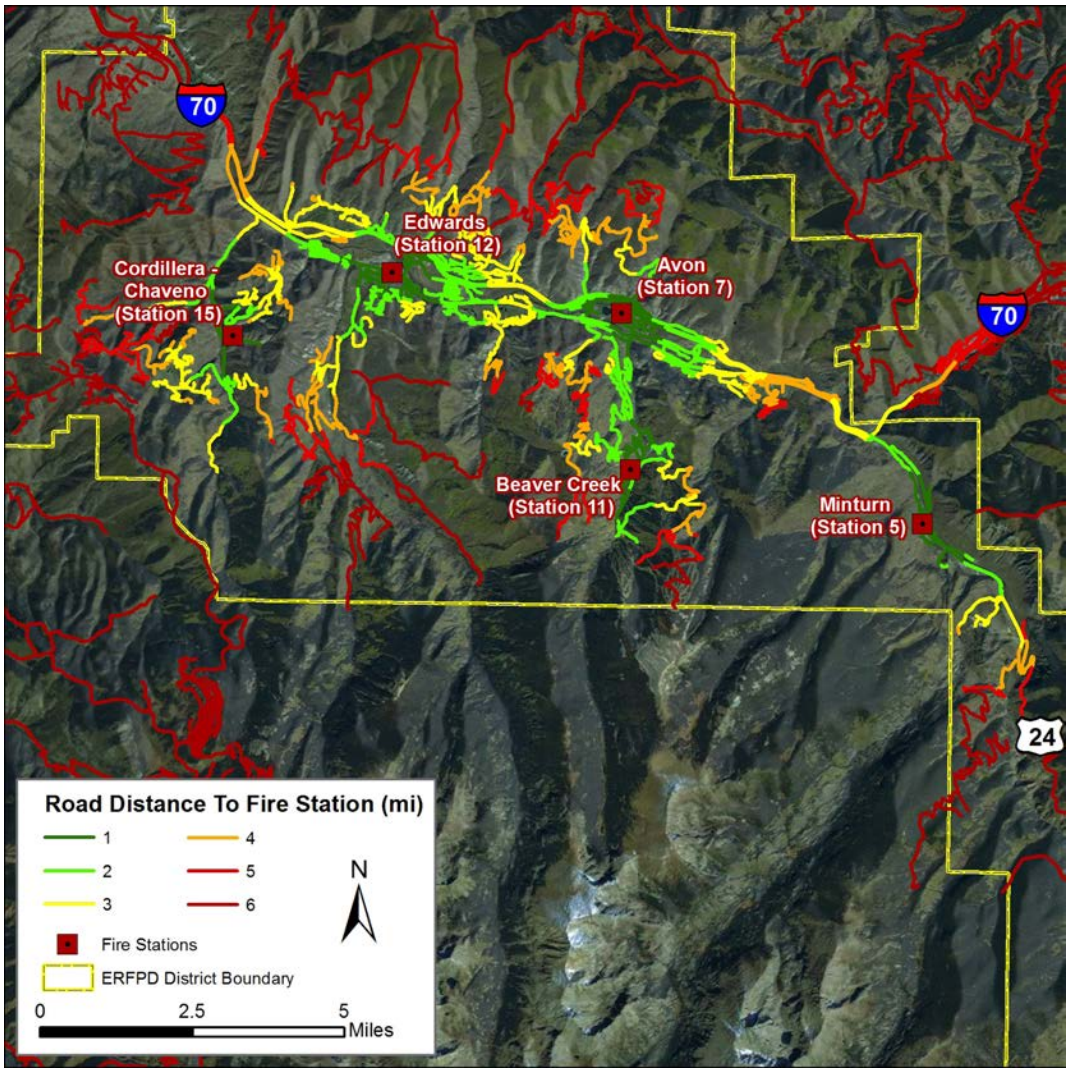


Figure 4. Proximity (driving distance) to nearest fire stations.

Local Preparedness & Fire Response Capabilities

RECOMMENDATIONS

Training

The level of training required of firefighters is more than many fire departments. ERFPD provides excellent training opportunities, especially because many of the courses are offered in-house. As a result, the recommendations in this document focus on maintenance of current policy, rather than proposing additional requirements:

- Continue to require S-130/S-190 for all firefighters.
- Continue to require the annual refresher and arduous pack test for fire fighters.
- Maintain training opportunities funded by federal resources.
- Consider agreements that detail use of federal resources, including engine rotations and helicopter crewmember training.
- Encourage personnel to take additional, beneficial courses, including S-215: Fire Operations in the Urban Interface and L-380: Fireline Leadership.
- Encourage personnel to seek higher qualifications and participate in out-of-district fire assignments.

Equipment

PPE

ERFPD currently provides the necessary wildland PPE for their firefighters, including radios and New Generation fire shelters. Wildland boots are the responsibility of the individual, which is typical of most fire departments. There are funding opportunities to purchase additional PPE and apparatuses. Information on the appropriate grants is available on page 144 of this report. We recommend the following:

- Acquire additional training shelters for the annual deployment drills.
- Be sure enough PPE is available to outfit the new recruits.
- Because PPE is provided, the department currently needs more Nomex brush pants and shirts.
- Acquire additional fireline packs, outfitted for New Generation shelters.

Position	Qualified Personnel	Trainees
Faller A (FALA)		15
Faller B (FALB)	2	3
Firefighter Type 1 (FFT1)		20
Engine Boss (ENGB)	3	4
Crew Boss (CRWB)		1
Helicopter Crew Member (HECM)		5
Strike Team Leader (STKL)	1	2
Task Force Leader (TSKF)	1	

Table 4. Overview of personnel qualifications.

Apparatus

Because of the narrow, winding, and steep roads within the district, it is often impossible to gain access to some areas with Type 1 engines. Although the department owns three Type 6 or 7 engines, the department has only one Type 3. The smaller Type 6 engines offer greater maneuverability and are able to get firefighters closer to a fire. Type 3 engines offer greater water and pump capacity, and still have pump-and-roll ability while maintaining the capability to access areas from steep, narrow roads. Additionally, a Type 3 is larger and has more space for equipment, including hose, tools, and medical supplies. Our recommendations:

- Purchase an additional Type 3 engine that would also be available for national dispatch.
- Work toward purchasing a new Type 6 engine, which also would be available for national dispatch and useful for maneuvering steep mountain roads.

WATER SUPPLY AND MAPPING

The majority of the fire district has excellent water supply. Hydrants are located throughout most communities, and they are maintained by Eagle County Water and Sanitation District. The communities that are lacking sufficient water, including Ute Forest, Timber Springs, Red Canyon, and Tennessee Pass should have cisterns added. Recommendations for these communities can be found in the community write-up sections. Our recommendations are as follows:

- Work with residents to mark volumes on all cisterns in the district.
- Ensure that firefighters are familiar with communities that have homes with sprinklers.

- All available water sources should continue to be marked by global positioning systems (GPS) and posted on a map that is available to local and incoming suppression resources. This should be updated as needed.
- Create additional year-round water storage resources in the district, such as ponds, cisterns, and tanks.
- Dry hydrant locations should be found along creeks and in any permanent water supply within the communities.
- Add the community of Ute Forest to the existing map books carried on the apparatus.
- Develop wildfire preplanning response plans for the fire protection district and communities that are covered by but are outside of the fire protection district boundary. Maps in these plans should include roads, evacuation routes, home locations, fuel breaks, and available water sources.
- Invite Eagle River Water & Sanitation District representatives to continue to participate in wildfire exercises. Those representatives will then be better prepared to assist firefighters in finding reliable sources of potable water during an actual emergency. ERWSD operators would monitor tank levels throughout the water district, and begin pumping water to where it is most needed.

Station Name (Number)	Staffed (Y/N)	Equipment
Red Cliff (4)	N	Type 1
Minturn (5)	Y	Type 1 Type 6
Eagle-Vail (6)	N	Type 1 Tactical Tender, 2,000 gallons, pump and roll
Avon (7) **(Fire Cache)**	Y	Type 1 Type 6 Haz-Mat Response Vehicle
Wildridge (8)	N	Type 1 (occasional reserve engine)
Beaver Creek (11) **(Contract Services)**	Y	Type 1 Type 3
Edwards (12)	Y	Type 1 Rescue Truck Tech Rescue Trailer
Cordillera – Chaveno (15)	Y	Type 1 Ladder
Cordillera – Summit (16)	N	Type 1, not typically used for response

Table 5. Summary of equipment and staffing at ERFPD stations.

Community Analysis & Recommendations

PURPOSE

The purpose of this section is to examine the communities in greater detail. Of the 21 new WUI communities defined in the ERFPD study area, none were found to represent an extreme hazard. Two were rated as having a very high hazard, and 15 were rated as high hazard, 4 were moderate, and 1 was low (Table 6). It is important to remember these communities are rated relative to what is customary for this specific type of wildland urban interface. While adhering to proven methodology, an attempt is made to approach each community as a unique entity with its own characteristics so that the most accurate, safe, and useful assessments possible are provided.

Very High	High	Moderate	Low
Ute Forest	Bellyache	Creamery Ranch	Eagle River Village
Whiskey Hill	Colorow	Eagle-Vail	
	Cordillera Valley Club	Homestead	
	Minturn	Lake Creek	
	Mountain Star	Red Cliff	
	Pilgrim Downs		
	Red Canyon		
	Red Sky Ranch		
	Singletree		
	Tennessee Pass		
	Timber Springs		
	West Lake Creek		
	Wildwood/Wildridge		

Table 6. Community hazard ratings within the study area.

NOTES ON FUELS TREATMENT TABLE IN THIS SECTION

PRI Priority

* Mechanical treatments in timbered areas include all varieties of logging equipment.

** Defensible space distances will vary by property based on slope and fuels. Acreages for fuel treatments are based on a +300'-wide fuel break. Actual acres treated may vary once project is implemented.

*** By removing all of the dead trees, communities may cause the remaining green trees to fall. If more that 50% of the trees are dead in a given stand, communities should consider removing all trees over 20 feet in height.

COMMUNITY ASSESSMENT METHODOLOGY

The community level methodology for this assessment uses a Wildfire Hazard Rating (WHR) that was developed specifically to evaluate communities within the WUI for their relative wildfire hazard.[1] The WHR model combines physical infrastructure such as structure density and roads, fire behavior components such as fuels, topography, rate of spread and flame length with the field experience and knowledge of wildland fire experts. Modeled values for flame length and rate of spread during extreme weather conditions are incorporated into the rating sheet for each community. This methodology has been proven and refined by use in rating thousands of neighborhoods throughout the United States.

Defined communities are the centerpiece of a CWPP. The definition of a community, for the purposes of a CWPP, has been refined by Anchor Point over the last ten years while producing these plans. In doing so, state and federal requirements and definitions have been taken into consideration. The Colorado State Forest Service requires that each community have representation during the planning process. This representation can be a fire department official, an HOA leader or a community member. Because each community must have representation, the unit should be a cohesive enough unit to support a single representative. Thus, a community should be a single geographic area that shares similar infrastructure, vegetation, topography, and as a result, similar recommendations. The communities and ratings identified by Anchor Point are displayed in figures 5 and 6. Lot/parcel sizes should be small enough that actions taken by individual residents will likely have an effect on their neighbor's fire risk, and may motivate further action. Close proximity is an easy way to encourage collaboration, and often a community will include multiple smaller subdivisions.

As a result of the dynamic nature of forested stands following MPB attack, community ratings identified in this document may not be the same in the future. Standing red or grey needled lodgepole pines will break or blowing over. The subsequent fire behavior will likely be different than when the trees are standing; hence the risk and recommendations may also vary. On Forest Service land, many stands have been slated to be clear-cut. Depending on when or if these projects are completed, the impact on fire behavior could be significant. A current evaluation of the forest surrounding a community should be completed before beginning any projects since the goal and prescription may be different than identified at this point.

Each community write-up can be regarded as an individual document. These pages can be delivered to a community independently of the overall document. As a result, you will see specific recommendations, if existing, for each community listed first, followed by recommendations that apply to all communities, such as defensible space. While seemingly repetitive, with this format, each community has all the pertinent information available in three pages, separate from the overall document. Not every community has a specific landscape-scale fuels project identified. In these communities, and in all of the communities, defensible space is the highest priority fuels treatment recommended. Defensible space and home construction is determined to be the greatest benefit for the least cost for landowners in all communities, regardless of whether landscape-scale fuel breaks are recommended. A summary of the Eagle County Wildfire Regulations can be found in Appendix A. This does not mean that a larger, landscape-scale project within the community/planning area could not be beneficial for the area, but it was not identified as the most important step in protecting life safety and values at risk. Identifying larger projects in the surrounding influence zones will be meaningful for obtaining grants to help fund all of the projects, especially the small acreage projects. Although large fuel breaks are not always as effective for individual home protection as defensible space, if implemented correctly, they can act as anchor points for suppression activities to begin.

Although the graphics provide general information regarding the overall hazard and risk rating for specific communities, they do not describe fully the specific information that formed the rating. At a minimum, it is necessary to review the individual community write-ups and recommendations. Complete understanding only can be attained by reading the accompanying text, in addition to looking at the graphics.

1 White, C. "Community Wildfire Hazard Rating Form." *Wildfire Hazard Mitigation and Response Plan.* Colorado State Forest Service, 1986. Ft. Collins, CO.

Community Analysis & Recommendations

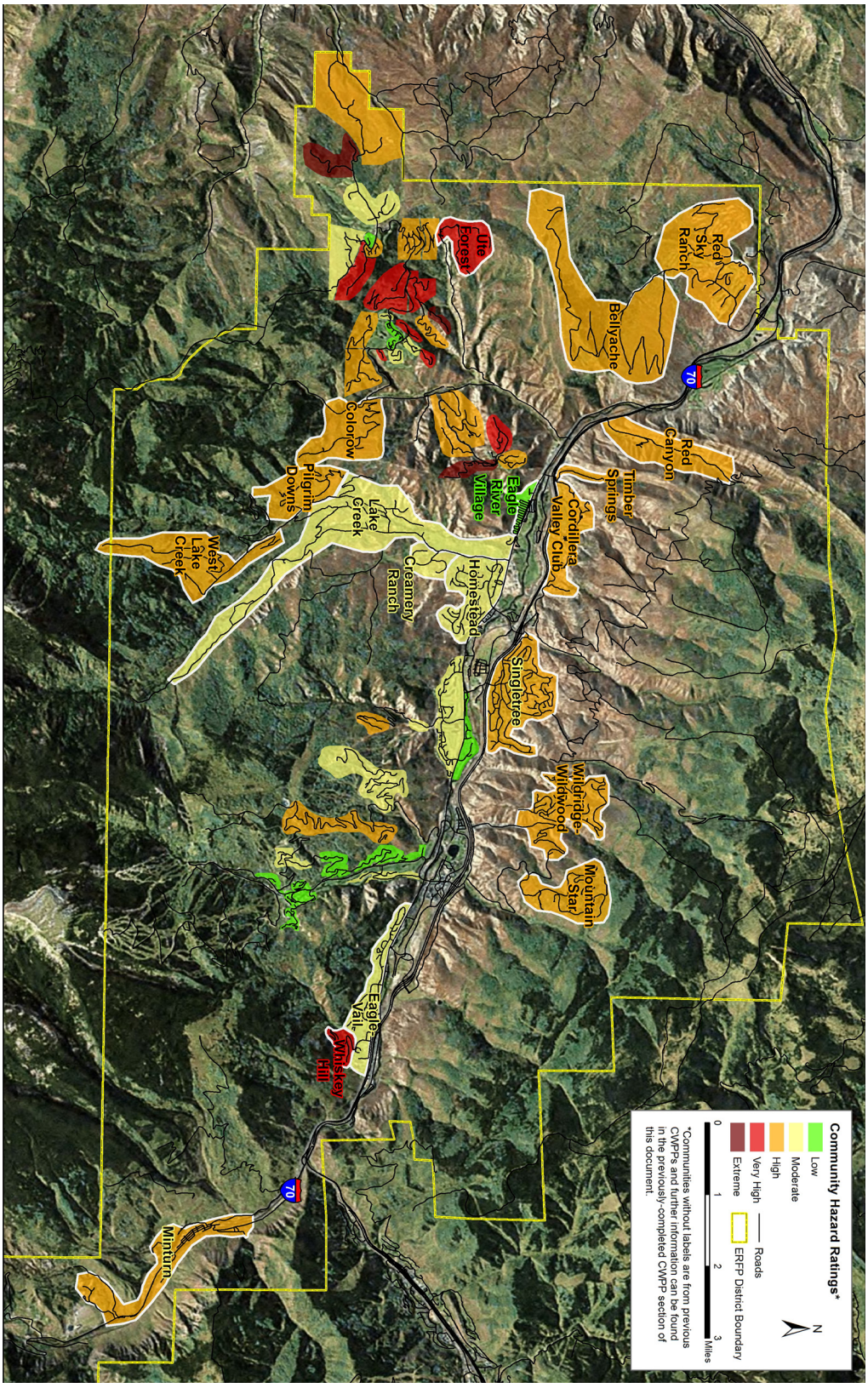


Figure 5. Community hazard ratings for the northern part of ERFPD.

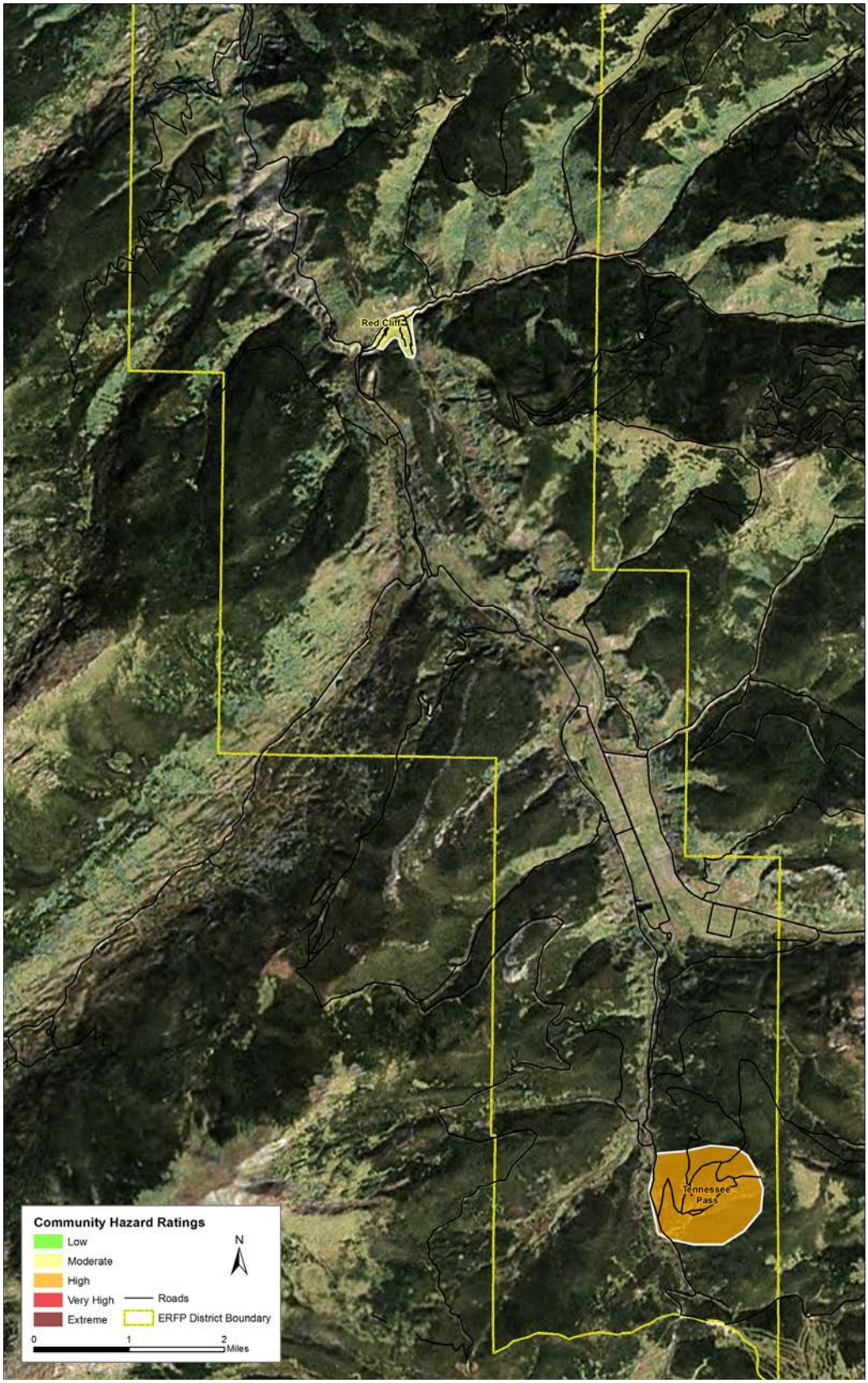


Figure 6. Community hazard ratings in the southern part of the ERFPD.

Bellyache

Number of Structures	121
Utilities Above or Below Ground	Below ground
General Construction	Mixture of combustible/noncombustible siding; roof class varies – some shake-shingle roofs
Average Lot Size	~5 Acres
Home Addresses	Present; inconsistent; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	>24'; <15%; paved
Emergency Vehicle Turnarounds	Long driveways; turnarounds at end of dead-end roads
Water Supply	Hydrants, variable pressure
Proximity to Staffed Fire Station	> 6 miles
Other Hazards	High home density; areas of dead lodgepole pine

About the Community

The community of Bellyache is located south of Wolcott on the western edge of the ERFPD. Access into the community is via a long, winding road (one way in and out). Many different fuel types are found within the community, including grass, sage, aspen, and Douglas fir. Also, a large component of beetle-killed lodgepole pine is found throughout the center of the community. In many areas, homeowners and the utility company have done a significant amount of clearing around homes and power lines. Additional clearing is both ongoing and planned, and, as a result, many homes have decent defensible space. Street signs in the community are wooden, and, thus, are combustible and nonreflective, meaning they could be difficult to see in dark and/or smoky conditions. The entirety of the community is located on a hillside, and there are steep slopes and drainages that lead into the community. Many homes are located on the edge of the steep hillsides, and will be more susceptible to fire spread uphill. Rapid rates of spread can be expected in these steep areas, especially those containing grass and sage. Flame lengths could easily exceed 11 feet in areas of standing dead lodgepole pine.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; limited mechanical treatments; sage treatments	200' around the home
Bellyache Ridge Road Fuel Treatment	2	Continue to remove hazardous trees along Bellyache Ridge Road, tying into and expanding beyond existing roadside treatments.	Hand felling and limbing; mechanical treatments where applicable	23 Acres
MPB Removal* **	3	Remove all dead lodgepole trees within the community. These trees pose a safety risk to residents and infrastructure, including those that have already fallen because they may cause increased difficulty with fire suppression.	Hand felling and limbing; mechanical treatments where applicable	N/A

* See Page 28

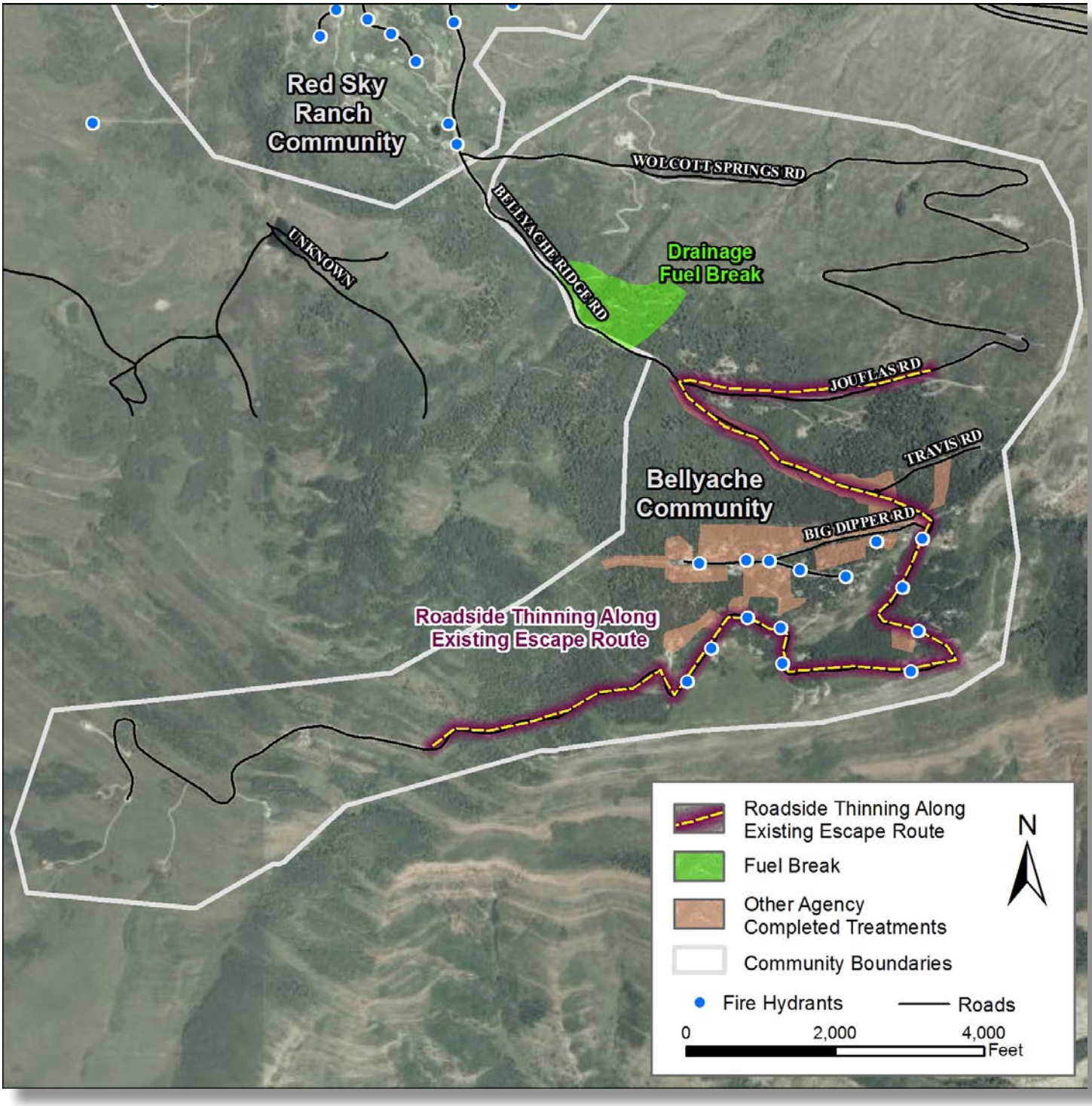
Bellyache

General Community Recommendations

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Remove all standing dead lodgepole trees that are near structures, power lines, and roads.
		Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

For more detailed recommendations on how to enhance the safety of your home and community, please refer to Appendix A.
See also the Ready, Set, Go! Program in Appendix A, page A25.

HAZARD RATING **HIGH**



Colorow

Number of Structures	42
Utilities Above or Below Ground	Overhead power lines
General Construction	Mixture of combustible/noncombustible siding; some shake-shingle roofs
Average Lot Size	~20 Acres
Home Addresses	Difficult to see in areas; inconsistent; nonreflective
Dual Access Roads	No
Road Widths, Slope, and Surface	~20'; steep road up with tight switchbacks; paved
Emergency Vehicle Turnarounds	Mostly inadequate; long, narrow driveways
Water Supply	Ponds and tanks
Proximity to Staffed Fire Station	~4 miles
Other Hazards	Adjacent hillside with beetle-kill; poor water supply

About the Community

Colorow is currently accessed via a narrow, steep road with tight switchbacks that is the only way in and out. There is a potential egress route down to Pilgrim Downs, which should be designated and improved for use by residents. Terrain surrounding the community is steep, with drainages running up into the community on the western side. The steep terrain combines with the light, flashy fuels such as grasses and sage found throughout the community to create the potential for rapid rates of spread. Other fuels in the area include aspen, Douglas-fir, spruce, and serviceberry. Adjacent hillsides are covered with dead lodgepole pine. Residents have been doing some clearing around their homes, but many homes lack adequate defensible space, especially in the lower areas of the community. There are no hydrants in the community, though limited water is available from small ponds, two existing 10,000-gallon tanks, and three planned 5,000-gallon tanks. Street signs in the community are wooden, and, thus, are combustible and nonreflective, meaning they could be difficult to see in dark and/or smoky conditions.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

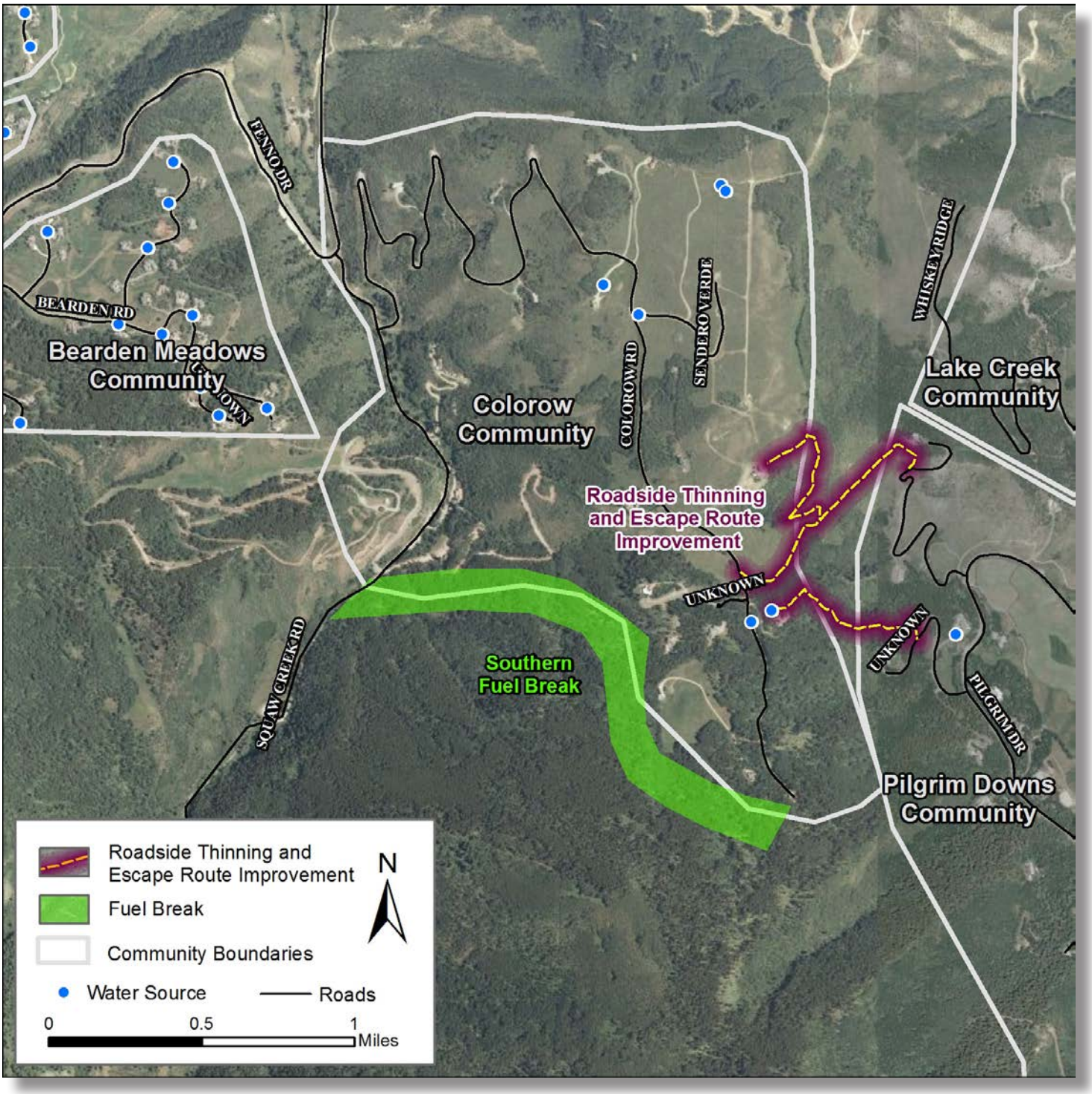
Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; limited mechanical treatments; sage treatments	200' around the home
Colorow Southern Fuel Break	2	There are numerous lodgepole killed by MPB along the southern edge of the community. Dead trees should be removed to limit embering and for public safety.	Hand felling and limbing; mechanical treatments where applicable	35 Acres
Secondary Egress	3	Improve the secondary egress between Colorow Road and Pilgrim Drive, and remove fuels along the route. This should be gated on both ends and used only for emergencies.	Hand felling and mowing; potentially some mechanical treatments	N/A
MPB Removal* **	4	Remove all dead lodgepole trees within the community. These trees pose a safety risk to residents and infrastructure, including those that have already fallen because they may cause increased difficulty with fire suppression.	Hand felling and limbing; mechanical treatments where applicable	N/A

* See Page 28

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Remove all standing dead lodgepole trees that are near structures, power lines, and roads.
		Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Continue to develop additional water sources, such as cisterns and tanks.
		Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **HIGH**



Cordillera Valley Club

Number of Structures	127
Utilities Above or Below Ground	Below ground
General Construction	Mixture of combustible/noncombustible siding; shake-shingle roofs
Average Lot Size	~1 Acre
Home Addresses	Difficult to see in areas; inconsistent; nonreflective
Dual Access Roads	Two ways in/out
Road Widths, Slope, and Surface	<20'; mostly flat; paved
Emergency Vehicle Turnarounds	Not adequate in most areas
Water Supply	Hydrants with good pressure
Proximity to Staffed Fire Station	~3 miles
Other Hazards	High housing density; non-year-round population; homes located on edges of steep hills

About the Community

The Cordillera Valley Club is located north of Edwards, off of Interstate 70. The entirety of the community surrounds an 18-hole golf course, which could serve as a large safety zone in the event of a fast moving wildfire. The primary fuels found in the community are grass, sage, and juniper, all of which will actively spread wildfire, especially during a strong wind event. Should such a wind event occur, rapid rates of spread are possible, with torching and running crown fire are a possibility in areas of dense juniper. The vast majority of homes have done little to no defensible space implementation, and many homes are surrounded on all sides by combustible fuels. The community is located at the base of a steep hillside, with a number of steep drainages and ridges. Moreover, many homes are located on these steep ridges and inside drainages, and, therefore, could be more susceptible to a fast moving fire. Street signs in the community are wooden, and, thus, are combustible and nonreflective, meaning they could be difficult to see in dark and/or smoky conditions.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; sage treatments	200’ around the home
Linked Defensible Space	2	Homeowners along the northern boundary of the community could greatly benefit if they worked together to created linked defensible space. This would act as a larger fuel break between homes and sage/juniper vegetation.	Hand felling and limbing near homes; mowing; limited mechanical treatments; sage treatments	3 Acres; 850 feet

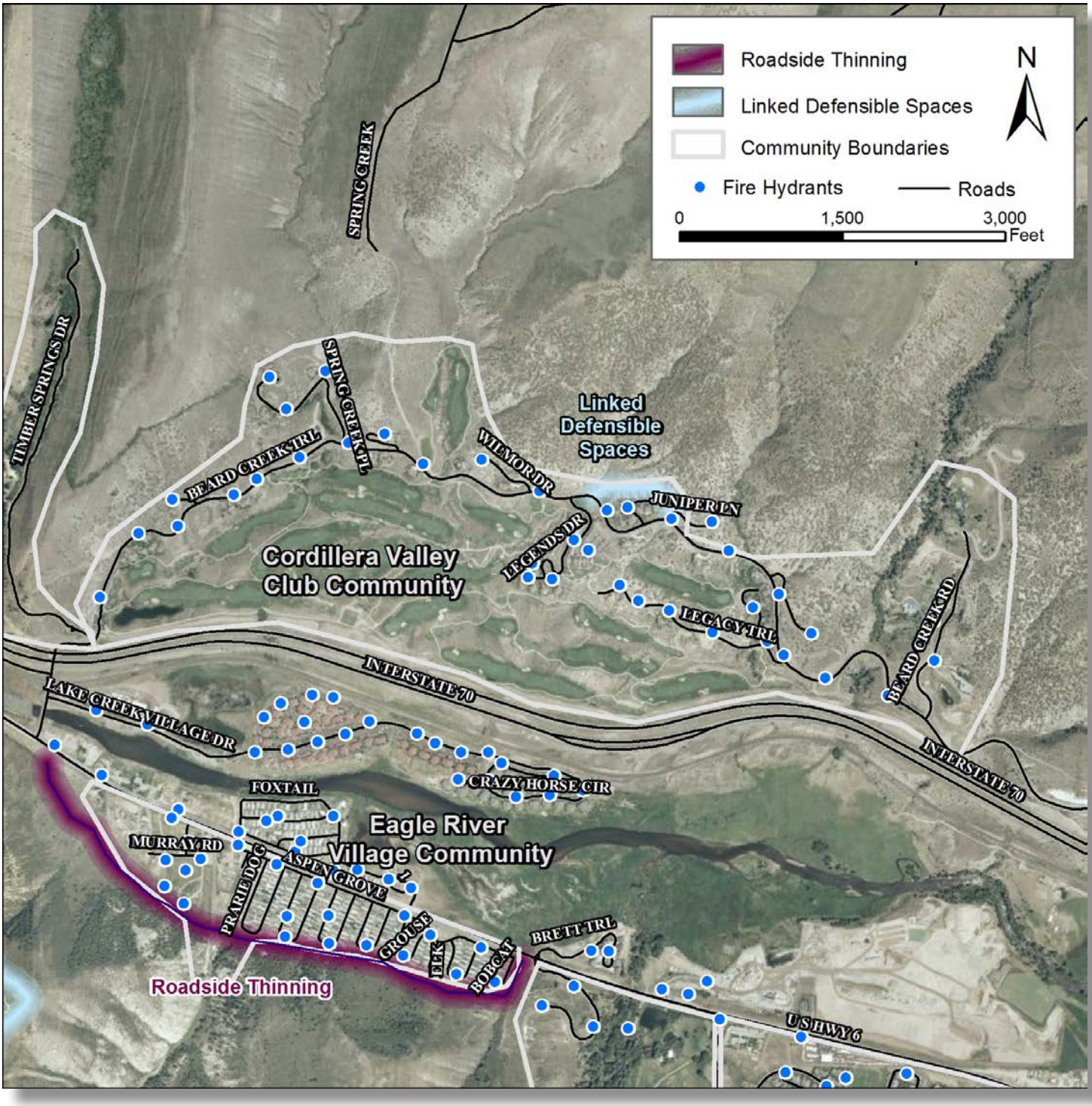
* See Page 28

Cordillera Valley Club

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' feet above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **HIGH**



Creamery Ranch

Number of Structures	15
Utilities Above or Below Ground	Below ground
General Construction	Wood siding; shake-shingle roofs
Average Lot Size	~2 Acres
Home Addresses	Difficult to see in areas; inconsistent; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	<20'; flat; paved
Emergency Vehicle Turnarounds	Not adequate; narrow driveways
Water Supply	Hydrants with good pressure
Proximity to Staffed Fire Station	~3 miles
Other Hazards	Non-year-round residents; adjacent agricultural burning

About the Community

The community of Creamery Ranch is located off of Lake Creek Road, south of Edwards. There is only one way in and out of the community, and both side roads also dead end. Most of the community area is covered in grass, with small sections of aspen and sage. Hence, residents can expect rapid rates of spread in the mostly light, flashy fuels, but short flame lengths. The terrain is mostly flat, though there is a small, shallow drainage that runs through the center of the community. Because of the type of vegetation present, most homes have adequate defensible space as long as surrounding grasses are mowed. This is especially true near ornamental trees that surround most homes in the community. The trees could be ignited by surrounding grasses. Street signs are on rocks, and are nonreflective, meaning that they could be difficult to read during nighttime and/or smoky conditions.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **MODERATE**

Fuels Treatment

Name	Priority	Description	Methods	Acres*
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Mowing around homes	200’ around the home

* See Page 28

Creamery Ranch

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop a community plan to provide proper maintenance to all community roads.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **MODERATE**

Eagle River Village

Number of Structures	365
Utilities Above or Below Ground	Above ground
General Construction	Combustible siding; metal roofs
Average Lot Size	<1 Acre
Home Addresses	Present; inconsistent; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	20-24'; flat; paved
Emergency Vehicle Turnarounds	Not adequate for large engines
Water Supply	Private hydrants throughout
Proximity to Staffed Fire Station	~2 miles
Other Hazards	High housing density; steep draw behind community

About the Community

Eagle River Village is a mobile home park on the south side of Interstate 70, west of the Edwards town center. Although there is little wildland vegetation within the park itself, there is a risk of home-to-home ignition. The close proximity of the structures is likely to result in direct flame impingement from an already burning home. The large drainage to the south of the trailer park is also of great concern. Light, flashy fuels, including grasses and sage, could allow fire to spread quickly uphill to additional homes on the ridge. Because of the higher population density and, hence, the increased likelihood of an ignition, fuels projects should be completed in the areas surrounding the park in order to decrease the risk of an uphill run.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **LOW**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; limited mechanical treatments; sage treatments	200' around the home
Roadside Fuel Break	2	A dirt road lies behind the community. Using it as an anchor point to reduce fuel loadings will limit the potential spread into communities uphill of Eagle River Village.	Hand felling and limbing; sage treatments; mowing; limited mechanical treatments	18 Acres

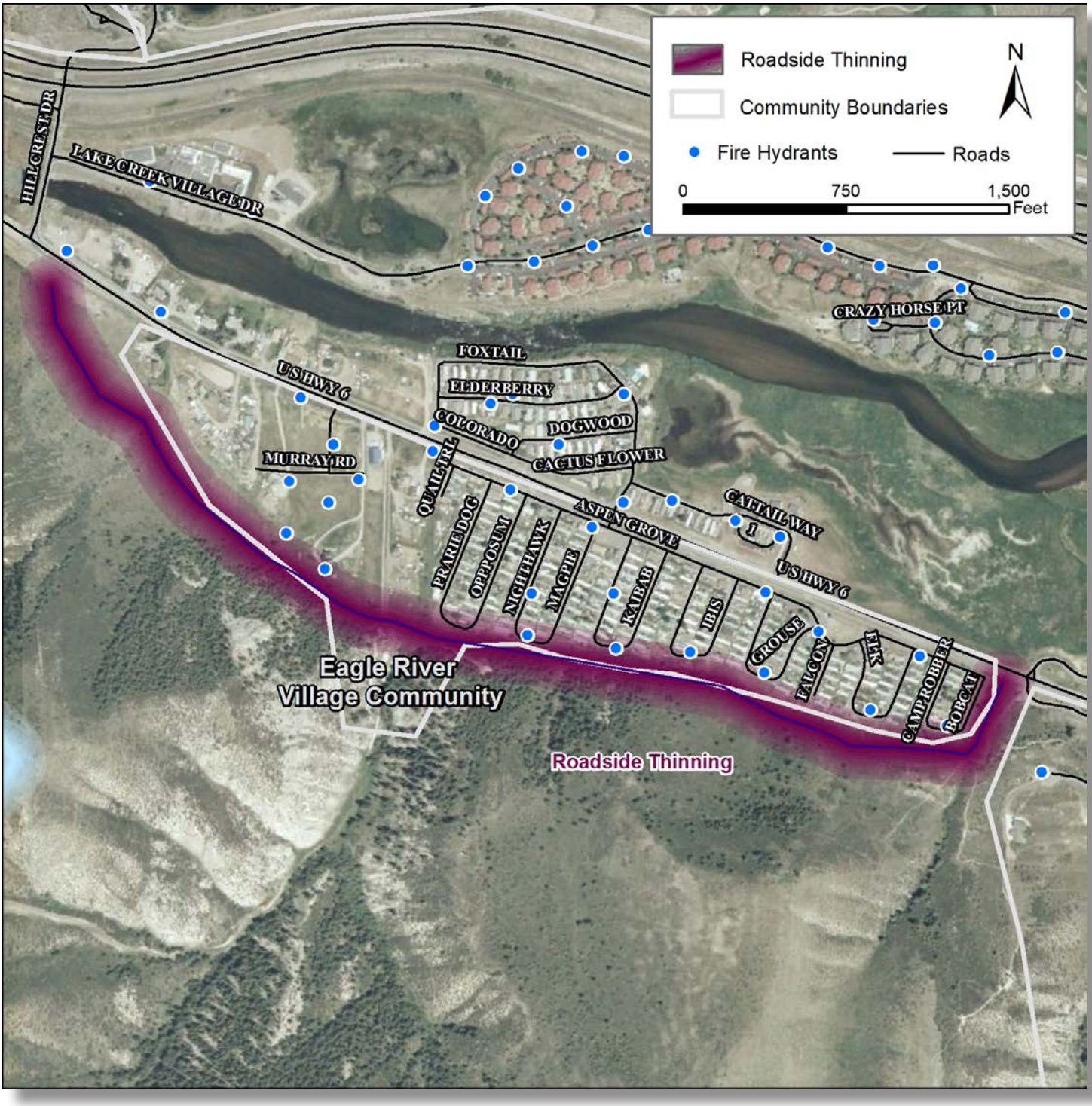
* See Page 28

Eagle River Village

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30' from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Public education is one of the most important steps for this community. The importance of fire safety is crucial to limit the number of ignitions that would impact Eagle River Village and communities in Cordillera.
		Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Develop safety brochures that can be distributed and made available to guests in the summer months.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **LOW**



Eagle-Vail

Number of Structures	512
Utilities Above or Below Ground	Below ground
General Construction	Noncombustible siding; variety of roof classes, including a significant amount of shake-shingle roofs
Average Lot Size	<1 Acre
Home Addresses	Present; inconsistent; nonreflective
Dual Access Roads	Multiple ways in/out
Road Widths, Slope, and Surface	20-24+'; flat; paved
Emergency Vehicle Turnarounds	Mix of adequate and inadequate turnarounds
Water Supply	Hydrants with good pressure
Proximity to Staffed Fire Station	<1 mile
Other Hazards	High housing density; non-year-round population, including tourists; flammable vegetation that runs up to the edges of the community

About the Community

The community of Eagle-Vail is located on the eastern edge of the district, near where Interstate 70 meets Highway 24. This unincorporated community includes more than 1,400 homes, not all of which have been included in this analysis. Although the southern edge of the community abuts combustible vegetation, much of the remaining community area could be considered urban and, thus, is at a lower risk from wildfire. Vegetation found on the southern hillside of the community includes sage, aspen, Douglas fir, and lodgepole pine. Many homes on the edges of the community lack adequate defensible space. Other areas of the community are protected by the golf course, which also could serve as a safety zone in the event of a fast-moving wildfire. Street signs in the community are wooden, and, thus, are combustible and nonreflective, meaning they could be difficult to see in dark and/or smoky conditions.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **MODERATE**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing	200' around the home
Linked Defensible Space	2	To reduce the risk of a structure fire turning into a wildfire, residents should work together on linked defensible space along Elk Lane.	Hand felling and limbing near homes; mowing; sage treatments	5 Acres; 2,100 feet

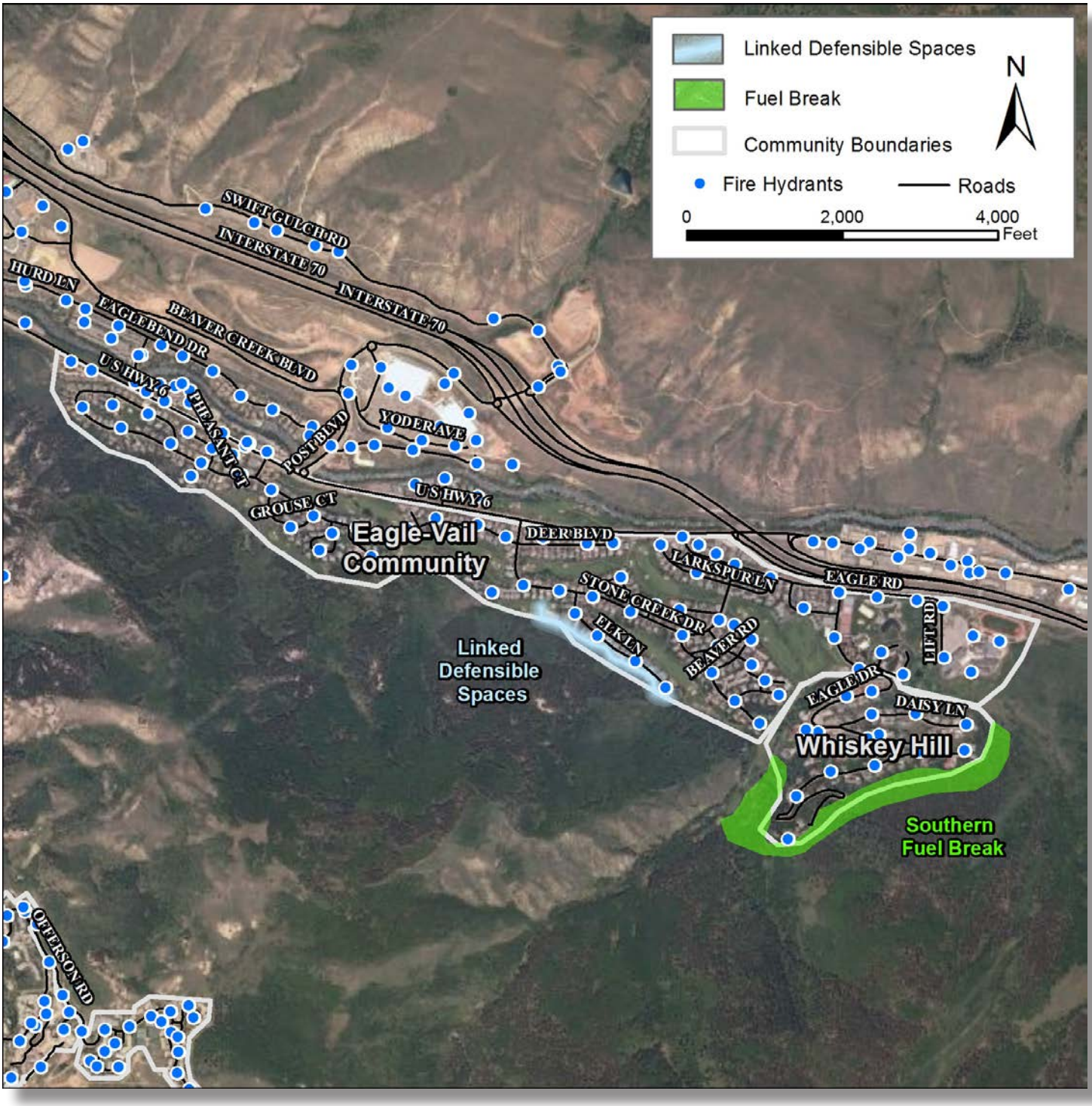
* See Page 28

Eagle-Vail

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Remove all standing dead lodgepole trees that are near structures, power lines, and roads.
		Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Public education is one of the most important steps for this community. Keeping the public apprised of fire danger and ways to prevent wildfire is key in reducing the fire hazard in the district.
		Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4” in width on a green background. These should be placed 3-5’ above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Develop safety brochures that can be distributed and made available to guests in the summer months.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **MODERATE**



Homestead

Number of Structures	513
Utilities Above or Below Ground	Below; overhead power lines adjacent to community
General Construction	Mostly noncombustible siding; high fire resistant roofs
Average Lot Size	<1 Acre
Home Addresses	Present; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	20-24'; <5%; paved
Emergency Vehicle Turnarounds	They are at ends of side roads; long, narrow driveways
Water Supply	Hydrants with good pressure
Proximity to Staffed Fire Station	2-3 miles
Other Hazards	High housing density; nearby elementary school

About the Community

The Homestead community is located on the hillside south of Edwards. There is currently only one way in and out of the community, though a secondary egress route that connects to Bull Run could be developed, and should be strongly considered to aid in the evacuation of residents. The primarily fuels in the community are grass and sage, with small patches of juniper, aspen, and planted ornamental trees. The main concern in the community is the small, narrow drainages that run uphill into the community. Numerous homes are located on the edges of these drainages and they could act to quickly spread fire throughout the community. Most homes on the edges of the drainages currently lack adequate defensible space, though this could be changed relatively easily by removing some down-slope fuels and mowing immediately around the entirety of the home. The light, flashy fuels found throughout the community are likely to result in rapid rates of spread, though flame lengths in most areas would be less than four feet.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **MODERATE**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Mowing; sage treatments	200' around the home
Secondary Egress	2	A secondary egress is suggested for this community. The location of this road should be somewhere in the vicinity of Lariat Loop and Homestead Loop. This road could be gated as an emergency-only access if needed. The roadside should be mowed.	Mowing; sage treatments	N/A
East and West Linked Defensible Spaces	3	Linked defensible space behind homes on Gold Dust Drive and those off of Cameron Place would act as a larger fuel break and protect many of the homes.	Mowing; sage treatments	East: 5 Acres; 2,100 feet. West: 3.5 Acres; 1,500 feet

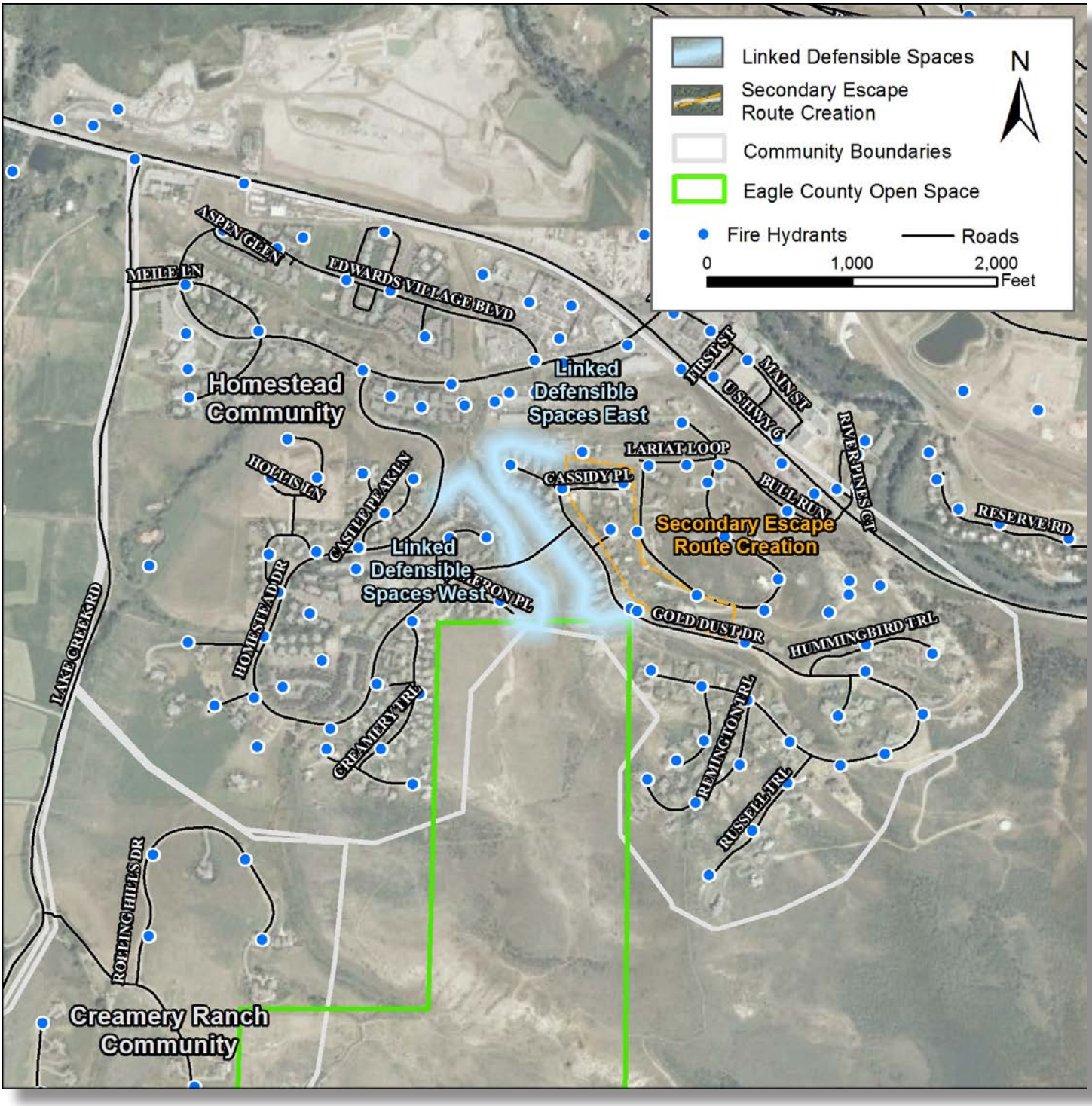
* See Page 28

Homestead

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Reaching out to school-aged children is a great opportunity because a school lies within this community. Fire safety and wildland-specific outreach by the fire department is an excellent way to reduce the chance of ignition.
		Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **MODERATE**



Lake Creek

Number of Structures	236
Utilities Above or Below Ground	Overhead power lines, but buried to homes
General Construction	Varied: mostly noncombustible siding, roof rating varies, lots of shake-shingle roofs
Average Lot Size	~5 Acres
Home Addresses	Difficult to see in areas; inconsistent; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	20-24'and narrower; generally flat, though some steep areas; paved and dirt
Emergency Vehicle Turnarounds	Not adequate in most areas
Water Supply	Hydrants
Proximity to Staffed Fire Station	2 to >6 miles
Other Hazards	Agricultural field burning; presence of livestock; bridges that are narrow and not always rated; areas of high housing density

About the Community

The Lake Creek community, located southwest of Edwards, contains most of the homes located immediately along Lake Creek Road. Access into the community turns from a paved road to a dirt road, and there are many narrow side roads with poor turnaround areas. Many homes are located midslope, as well as atop steep hills and at the bases of hillside drainages. A wide variety of fuel types are in the community, including grass, sage, juniper, aspen, and spruce-fir. The rolling hills and drainages in the community, along with light, flashy fuels such as grass and sage, will act to spread fire quickly throughout the community area. Many homes in the community lack adequate defensible space, and some areas have high housing densities. Street signs throughout the community are not always present, and of those that are present, many are made of wood, meaning they are both combustible and nonreflective.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **MODERATE**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; limited mechanical treatments; sage treatments	200' around the home
Secondary Egress Improvement (to Pilgrim Downs)	2	Designate and improve the road east of the community that runs from West Lake Creek Road to Lake Creek Road. This route should be maintained, and vegetation along the road should be kept to a minimum.	Hand felling and limbing; limited mechanical treatments; sage treatments	~5,800 feet
MPB Removal* **	2	Remove all dead lodgepole trees within the community. The trees pose a safety risk to residents and infrastructure, including those that have already fallen because they may cause increased difficulty with fire suppression.	Hand felling and limbing; mechanical treatments where applicable	N/A

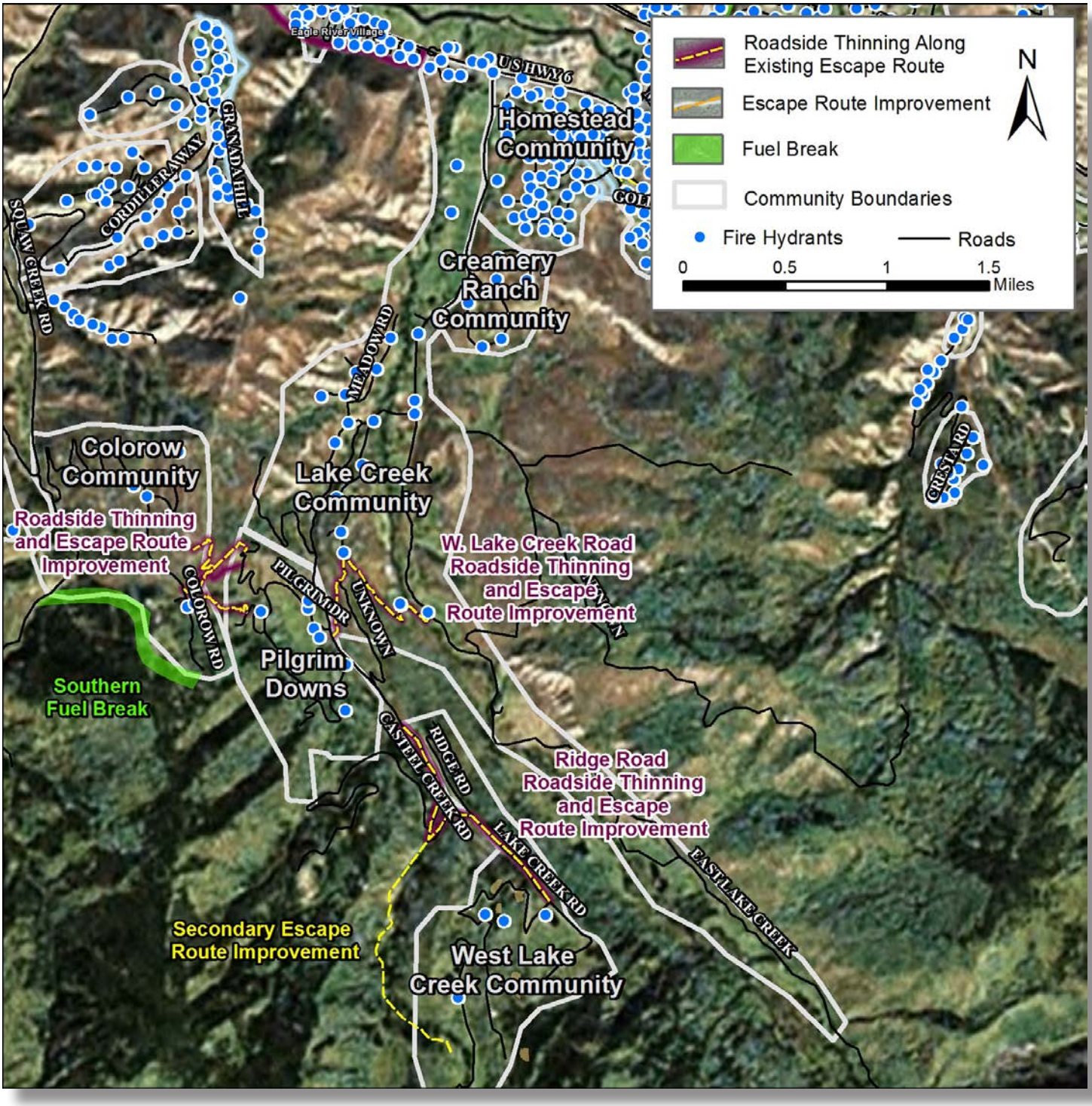
* See Page 28

Lake Creek

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Remove all standing dead lodgepole trees that are near structures, power lines, and roads.
		Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop a community plan to provide proper maintenance to all community roads.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
Infrastructure	4	All bridges should either be rated by the county and/or identified by the fire department as unrated/rated so they know which ones not to use
		Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **MODERATE**



Minturn

Number of Structures	694
Utilities Above or Below Ground	Above – numerous overhead power lines
General Construction	Mixture of combustible/noncombustible siding; roofs are mostly metal, with some shake-shingle roofs
Average Lot Size	<1 Acre
Home Addresses	Present; inconsistent; nonreflective
Dual Access Roads	Two ways in/out; many one-way side roads
Road Widths, Slope, and Surface	Wide highway, side roads <20'; mostly flat; paved
Emergency Vehicle Turnarounds	Not adequate in most areas
Water Supply	Hydrants in town are not always reliable; dry hydrants at Kings Ranch
Proximity to Staffed Fire Station	<1 mile
Other Hazards	High housing density; railroad tracks through town; no water/snow maintenance on weekends; heavy traffic on Hwy 24

About the Community

The town of Minturn is located in the valley bottom along Highway 24. The population of the town is approximately 1,100. The valley sides surrounding the town are steep, and are covered primarily with grass and sage on the northern side, and grass, sage, aspen, and lodgepole pine on the southern side. Most lodgepole pine trees within the vicinity of town are dead, and will eventually blow down if not removed. The water system in town is old, and is sometimes unreliable at the hydrant. Side roads through town are narrow, and lack adequate turnaround for large apparatus. Smaller subdivisions of the town include Kings Ranch and the Maloit Park School area, both of which are accessed by one-way-in-and-out roads and are surrounded by flammable vegetation. Some homes on the edge of town have done limited defensible space work, but more needs to be done to be fully effective. Street signs throughout town are metal and reflective, though they are not present in all areas.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each individual home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; limited mechanical treatments; sage treatments	200' around the home
Fuel Breaks 1, 2, and 3	2	Along the southern edge of the community, many trees are dying from MPB. Connecting to planned Forest Service treatments, continue to enlarge fuel breaks	Hand felling and limbing; mechanical treatments where applicable	1: 9 Acres 2: 6 Acres 3: 32 Acres
Completion of Forest Service Fuel Breaks	2	The proposed fuel breaks south of town should be completed. However, there is currently a problem selling the fuel breaks.	Mechanical treatments; hand felling and limbing	TBD
MPB Removal* **	3	Remove all dead lodgepole trees within the community. The trees pose a safety risk to residents and infrastructure, including those that have already fallen because they may cause increased difficulty with fire suppression.	Hand felling and limbing; mechanical treatments where applicable	N/A

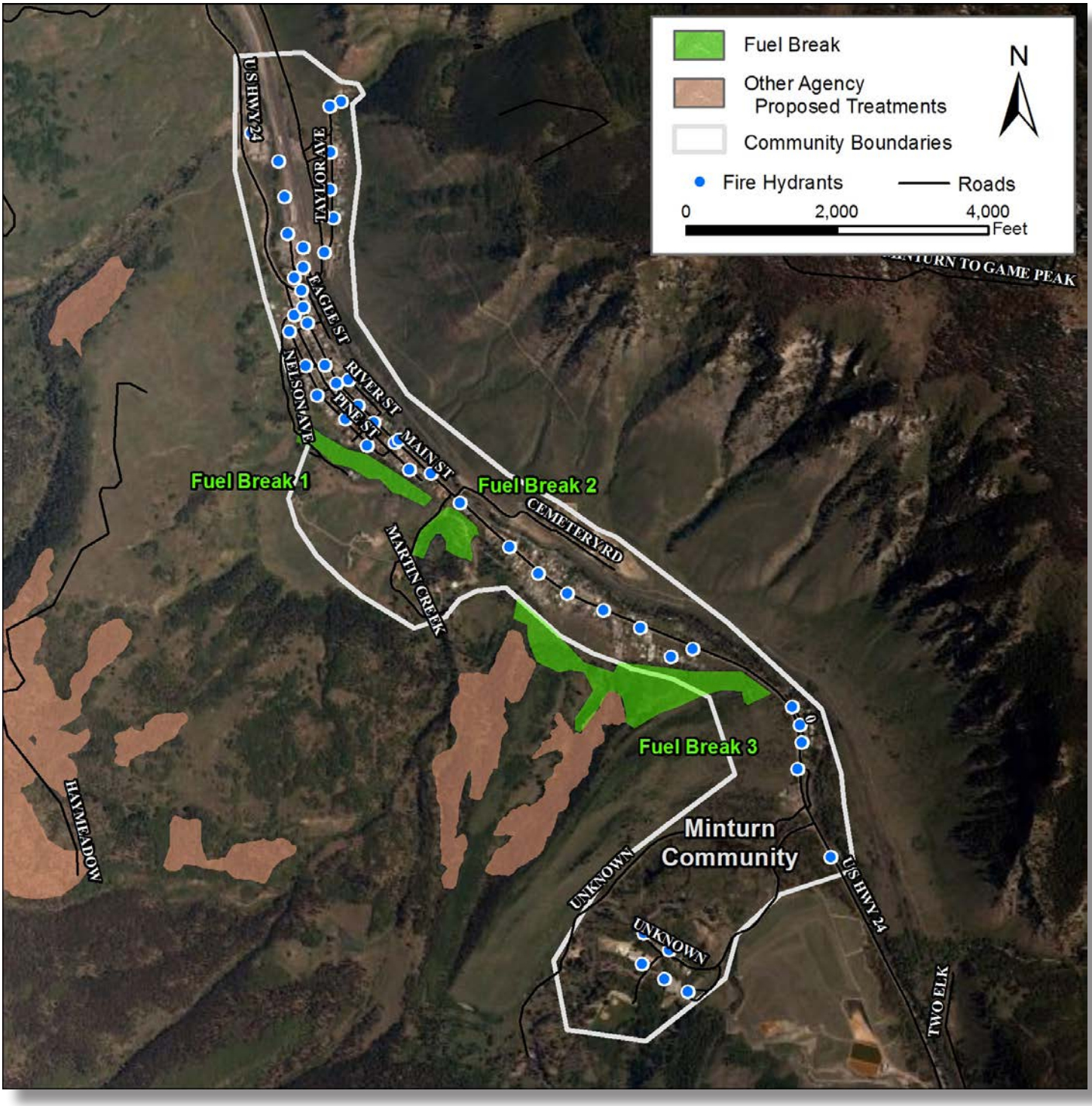
* See Page 28

Minturn

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Remove all standing dead lodgepole trees that are near structures, power lines, and roads.
		Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Develop safety brochures that can be distributed and made available to guests in the summer months.
Infrastructure	4	Ensure the operability and function of the city's water supply.
		Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community; including hydrants, cisterns, and ponds, Make sure that they are visible, maintained, and operable.

HAZARD RATING **HIGH**



Mountain Star

Number of Structures	61
Utilities Above or Below Ground	Below ground
General Construction	Noncombustible siding; mostly shake-shingle roofs
Average Lot Size	~3 Acres
Home Addresses	Present; metal; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	20-24'; <10%; paved
Emergency Vehicle Turnarounds	Not adequate in all areas
Water Supply	Hydrants with good pressure
Proximity to Staffed Fire Station	>5 miles
Other Hazards	Non-year-round population; homes near steep edges of hillside

About the Community

The Mountain Star community is part of the Town of Avon, and is located on the hillsides north of the town center. Most of the homes in the community are located within a large aspen stand, which is surrounded by sage and grass. Rapid rates of spread can be expected up to the community due to the presence of steep terrain, the funneling of nearby drainages, and the presence of light, flashy fuels. A number of homes in the community are located atop these steep drainages and slopes, and, thus, are at an increased risk. Most homes in the community lack any defensible space, and many have more flammable species such as spruce amongst the aspen around their homes. Above the community are large stands of beetle-killed lodgepole pine which are also of concern. Street signs throughout the community consist of metal lettering on rocks, and although they are noncombustible, they will be difficult to see under nighttime and/or smoky conditions.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

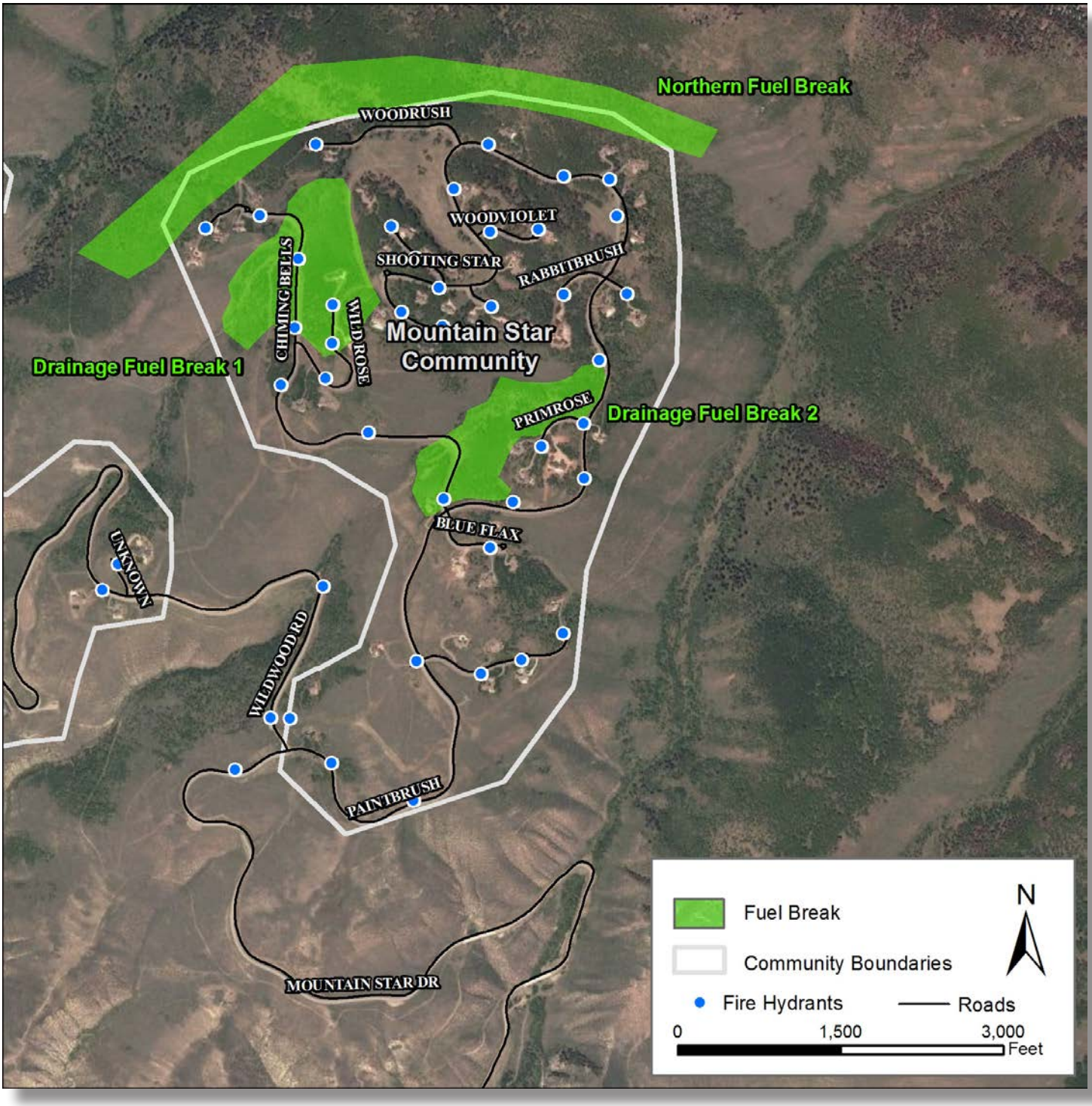
Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; limited mechanical treatments; sage treatments	200' around the home
Fuel Breaks 1 and 2	2	Steep slopes with dense shrub vegetation should be thinned to reduce the impact a wildfire could have on the structures and infrastructure within the community.	Sage treatments; mowing for grass	1: 29 Acres 2: 20 Acres
Northern Fuel Break	2	A fire igniting within the community or a structure fire poses a threat to the surrounding area. This fuel break will reduce the risk of a larger wildfire.	Hand felling and limbing near homes; mowing; limited mechanical treatments; sage treatments	55 Acres
MPB Removal* **	3	Remove all dead lodgepole trees within the community. The trees pose a safety risk to residents and infrastructure, including those that have already fallen because they may cause increased difficulty with fire suppression.	Hand felling and limbing; mechanical treatments where applicable	N/A

* See Page 28

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Remove all standing dead lodgepole trees that are near structures, power lines and roads.
		Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5'above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	The proposed water tank above the community should be strongly considered due to its ability to augment pressure and volume within the community.
		Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **HIGH**



Pilgrim Downs

Number of Structures	43
Utilities Above or Below Ground	Below ground
General Construction	Noncombustible siding; shake-shingle roofs
Average Lot Size	~7 Acres
Home Addresses	Difficult to see; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	<20'; mostly flat; paved
Emergency Vehicle Turnarounds	Not adequate; long, narrow driveways with small turnarounds
Water Supply	Large ponds with stand pipes; no hydrants
Proximity to Staffed Fire Station	>5 miles
Other Hazards	Horses

About the Community

Pilgrim Downs is located off of Lake Creek Road, south of Edwards. The community covers more than 300 acres and at least 25 of the 43 structures are homes. Much of the community area is relatively flat, though homes are at the bases of steep drainages. The main vegetation types in the community are grass and aspen, and many of the homes surround a large meadow in the center of the community area. There are large stands of beetle-killed lodgepole pine, which are at an increased risk for fire compared to aspen found further up on the hill above the community. Most homes that are located in forested areas lack any defensible space and are almost entirely surrounded by vegetation near the home. There is an option of creating/ improving a secondary egress route up the hill to the Colorow subdivision. This road should be designated specifically as an escape route only, and it should be improved for use only in emergencies.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing	200' around the home
Secondary Egress Improvement (to Lake Creek)	2	Designate and improve the road east of the community that runs from West Lake Creek Road to Lake Creek Road. This route should be maintained, and vegetation along the road should be kept to a minimum.	Hand felling and limbing; limited mechanical treatments; sage treatments	~5,800 feet
Secondary Egress (to Colorow)	3	Improve the road between Colorow and Pilgrim Downs as a secondary egress. Ensure the road is maintained and vegetation is kept to a minimum. Gating the road is recommended, and it should be used for emergency purposed only.	Mechanical treatments; mowing	N/A
MPB Removal* **	4	Remove all dead lodgepole trees within the community. The trees pose a safety risk to residents and infrastructure, including those that have already fallen because they may cause increased difficulty with fire suppression.	Hand felling and limbing	N/A

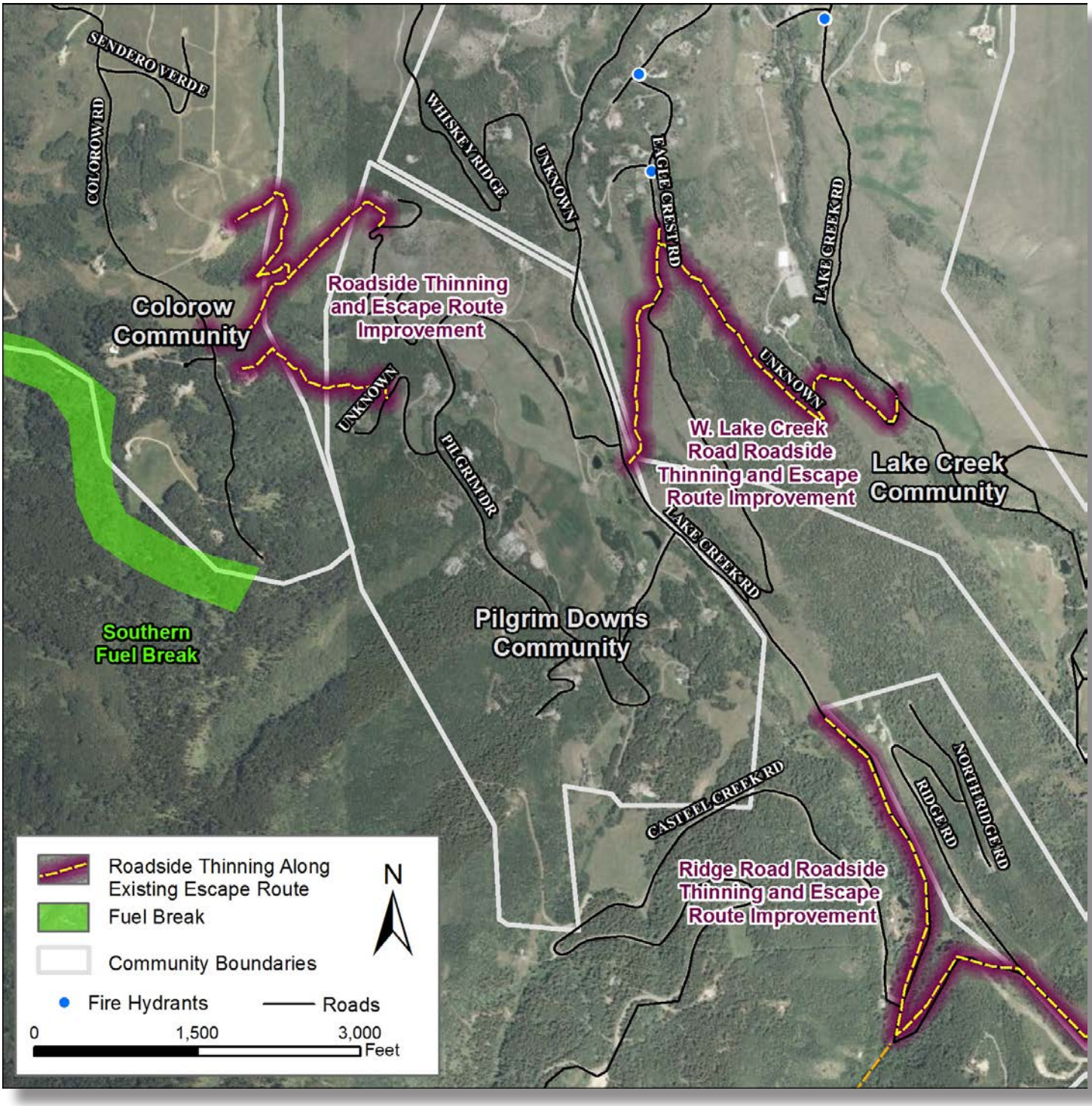
* See Page 28

Pilgrim Downs

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Embers landing on the roofs from the forest above are the greatest concern to this community. Roof type is critical. Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Remove all standing dead lodgepole trees that are near structures, power lines, and roads.
		Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **HIGH**



Red Canyon

Number of Structures	18
Utilities Above or Below Ground	Below ground
General Construction	Mostly noncombustible siding; high fire resistant roofs
Average Lot Size	~35 Acres
Home Addresses	Not present, or not visible
Dual Access Roads	One way in and out
Road Widths, Slope, and Surface	<20'; mostly flat; paved
Emergency Vehicle Turnarounds	Not adequate in all areas
Water Supply	Small ponds for drafting
Proximity to Staffed Fire Station	4-5 miles
Other Hazards	Narrow cement tunnel only access to community

About the Community

The community of Red Canyon is located north of Interstate 70, between Wolcott and Edwards. Access into the community is via Red Canyon Ranch Road, off of Highway 6. In order to get into the community area, responders must go through a narrow cement tunnel beneath Interstate 70 that does not accommodate many types of large apparatuses and is not maintained in the winter. There are no hydrants in the community, but water is available from numerous small ponds that are scattered along the length of the community. The primary vegetation types in the community are grass in the valley and sage on the hillsides above. These light, flashy fuels will actively promote rapid rates of spread, but comparatively low flame lengths. Most homes have decent defensible space around them due to watered lawns and the clearing and mowing of some grass and sage brush, but some still lack defensible space. Street signs are metal and reflective, but home addresses are difficult to see and sometimes not present.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Mowing; sage treatments	200’ around the home

* See Page 28

Red Canyon

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop a community plan to provide proper maintenance to all community roads.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Evaluate the dirt road upslope as a secondary access/egress. Any gates codes should be given to the fire department so it can be opened during an emergency.
		Install a ~20,000 gallon water tank for fire department use. In addition, consider establishing dry hydrants within the local ponds.
		Provide adequate turnarounds for fire apparatuses throughout the community.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **HIGH**

Red Cliff

Number of Structures	222
Utilities Above or Below Ground	Above ground – low hanging power lines
General Construction	Mixture of combustible/noncombustible siding; mostly high fire resistance roofs, some shake-shingle roofs
Average Lot Size	<1 Acre
Home Addresses	Present; nonreflective
Dual Access Roads	Three ways in/out, two that are above and below each other and the other of which is a dirt FS road
Road Widths, Slope, and Surface	<20 feet; mostly flat, some steep areas; paved
Emergency Vehicle Turnarounds	Not adequate in most areas
Water Supply	Scattered hydrants
Proximity to Staffed Fire Station	~9 miles
Other Hazards	Poor radio reception in the area; lower access bridge is old and may not be rated for all types of large fire apparatuses

About the Community

The town of Red Cliff is located south of Minturn, off of Highway 24. Homes and businesses are clustered along the valley bottom on both sides of the railroad tracks that run through town. The population of the town is approximately 300. The steep hillsides that surround town are covered primarily with grass, sage, spruce, and beetle-killed lodgepole pine. In the immediate town area, the primary fuels are grass, aspen, and a mix of shrubs. Most homes in the town area have partial defensible space, though combustible fuels run throughout the town area. There is a fire station in town, though it is not staffed, meaning that the closest resources would respond from Minturn. Street signs throughout town are metal, though they are not present on all roads. Present conditions in the area. Present conditions in the town area indicate an overall moderate rating for the town. However, this could change as fuels conditions change following the progression of the mountain pine beetle.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **MODERATE**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. Specifically focus on mowing grassy areas around structures. See Appendix A for details.	Hand felling and limbing near homes; mowing; sage treatments	200' around the home
MPB Removal* **	2	Remove all dead lodgepole trees within the community. The trees pose a safety risk to residents and infrastructure, including those that have already fallen because they may cause increased difficulty with fire suppression.	Hand felling and limbing; mechanical treatments where applicable	N/A

* See Page 28

Red Cliff

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Remove all standing dead lodgepole trees that are near structures, power lines, and roads.
		Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
Preparedness Planning/ Evacuation	3	Consider training members of the community as volunteer firefighters. The ability to respond quickly is the most effective way to protect lives and homes.
		Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Develop safety brochures that can be distributed and made available to guests in the summer months.
Infrastructure	4	Consider adding new water sources, especially in the southwest and northeast sections of town.
		Provide adequate turnarounds for fire apparatuses throughout the community.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **MODERATE**

Red Sky Ranch

Number of Structures	56
Utilities Above or Below Ground	Below ground
General Construction	Noncombustible siding; all shake-shingle roofs
Average Lot Size	~2 Acres
Home Addresses	Metal on wooden posts; nonreflective
Dual Access Roads	No
Road Widths, Slope, and Surface	20-24'; <15%; paved
Emergency Vehicle Turnarounds	Not for large trucks; dead-end roads have small turnaround areas
Water Supply	Hydrants; stand pipes
Proximity to Staffed Fire Station	>5 miles
Other Hazards	Frequent lightning on nearby hillside; non-year-round population and guests

About the Community

Located south of Wolcott, Red Sky Ranch Club is on the western edge of the district. Homes surround two private 18-hole golf courses, which provide great safety zones in the event of a wildfire. The primary fuels in the community are grass, sage, and juniper, all of which will actively spread fire, especially during a strong wind event. During such an event, rates of spread have the potential to be so fast that firefighters may not be able to respond in time. Most homes have some level of defensible space protection due to the presence of the golf course and the type of landscaping that has been done around the home. However, combustible fuels abut most homes on at least one side. A steep ridge runs through the middle of the community, which will further act to increase rates of spread and could potentially result in the road out of the community being unusable. Street signs consist of metal lettering on rocks. Although they are noncombustible, these signs may be difficult to see during nighttime and/or smoky conditions due to their low height and being nonreflective.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; sage treatments	200' around the home
Mowing	2	Maintain the mowed areas throughout the community. This will be useful for reducing the fire intensity and rate of spread.	Mowing	N/A

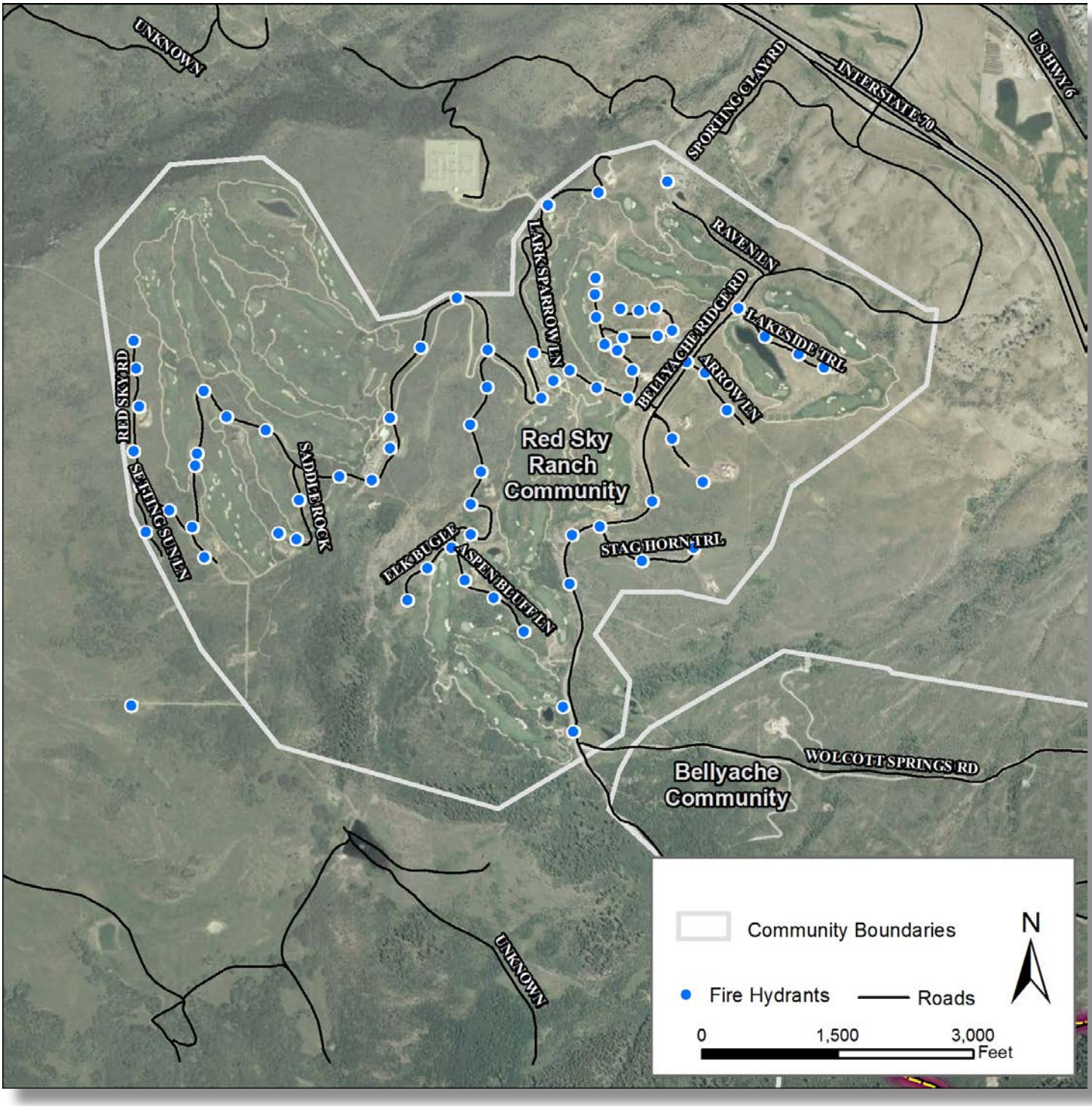
* See Page 28

Red Sky Ranch

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Coordinate with the golf course staff for access to sprinkler-system operations. Turning on the sprinklers will raise the relative humidity in the area, thus minimizing fire behavior.
		Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Develop safety brochures that can be distributed and made available to guests in the summer months.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **HIGH**



Singletree

Number of Structures	677
Utilities Above or Below Ground	Below ground
General Construction	Mixture of combustible/noncombustible siding; mostly shake-shingle roofs
Average Lot Size	<1 Acre
Home Addresses	Present; nonreflective
Dual Access Roads	Two ways in/out
Road Widths, Slope, and Surface	>24'; mostly flat; paved
Emergency Vehicle Turnarounds	Adequate in some areas; some have long, narrow driveways
Water Supply	Hydrants with good pressure
Proximity to Staffed Fire Station	<1 mile
Other Hazards	High housing density; adjacent medical center

About the Community

Singletree is located north of Interstate 70, northwest of the town of Edwards. Many of the homes surround an 18-hole golf course. The primarily vegetation types in the community consist of grass and sage, which grow against many homes on the perimeter of the community. These light, flashy fuels will act to spread fire quickly, especially when driven by high winds. The southern section of the community surrounding the golf course is mostly flat, while the northern section consists of some steep, narrow drainages, all of which have homes within them. These drainages will act to further increase rates of spread by funneling winds and heat from a growing fire. While homes in the center areas of the community have lawns and decent defensible space, many homes on the perimeter do not. Clearing of sage brush behind homes and mowing of grasses would help protect these areas. Street signs throughout the community are metal and reflective, while home addresses are not reflective.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Mowing; sage treatments	200' around the home
Chaparral Linked Defensible Space	2	Linked defensible space on the east edge of the community will protect much of the area from an ignition initiating along the highway.	Mowing; sage treatments	4 Acres; 1,800 feet
Latigo Fuel Break	3	The steep slope above Latigo Circle has a significant amount of shrub vegetation. It should be managed to reduce the rate of spread toward the rest of the community.	Mowing; sage treatments	4 Acres

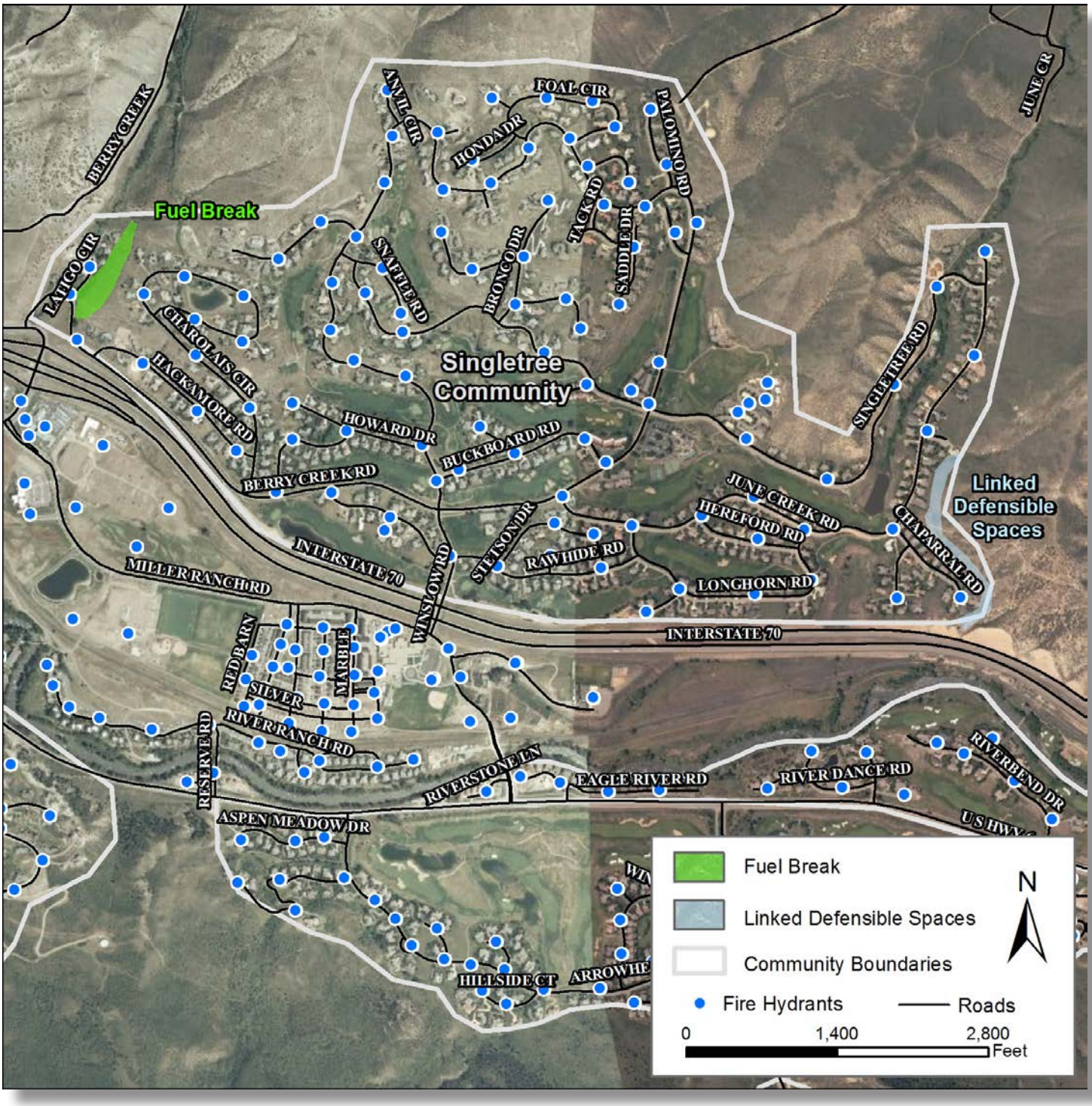
* See Page 28

Singletree

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop a community plan to provide proper maintenance to all community roads.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained and operable.

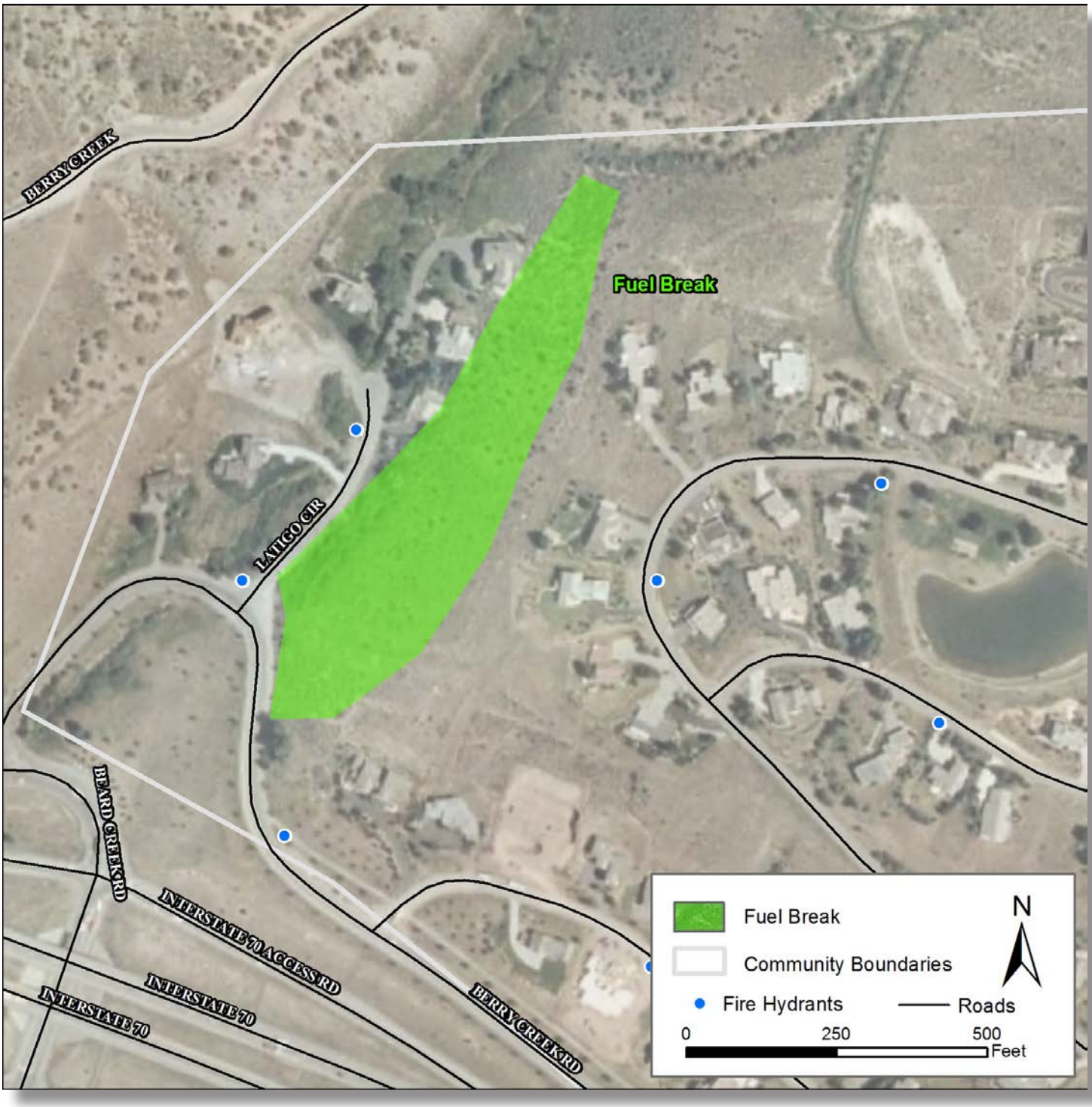
HAZARD RATING **HIGH**



Singletree


Linked Defensible Spaces
Community Boundaries
Fire Hydrants
Roads
0
350
700
Feet
N
JUNE CREEK RD
ROWEL DR
SINGLETREE RD
Linked Defensible Spaces
CHAPARRAL RD
LONGHORN RD
LARIAT RD
INTERSTATE 70

HAZARD RATING **HIGH**



Tennessee Pass

Number of Structures	33
Utilities Above or Below Ground	Below ground
General Construction	Noncombustible siding; high fire resistant roofs
Average Lot Size	~10 acres
Home Addresses	Present; inconsistent; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	<20'; <10%; dirt, poorly maintained in some areas
Emergency Vehicle Turnarounds	Not adequate
Water Supply	Some homes have 2,000 gallon cisterns; beaver ponds for drafting below the community
Proximity to Staffed Fire Station	~20 miles to Minturn; ~9 miles to Leadville
Other Hazards	Remaining UXOs may be in the area; Vance's Cabin visitor hut; adjacent Forest Service camping areas

About the Community

The community of Tennessee Pass is located off of Highway 24, between the towns of Red Cliff and Leadville. Homes are built on old mining claims on the hillside east of the highway. At approximately 10,000 feet, the community's primary vegetation types are lodgepole pine and spruce-fir. Fire return intervals are in the hundreds of years and normally will occur only under extreme weather conditions. Many homes in the community have partial defensible space, though not all homes do, and more work could be done. Water is in short supply, and aside from a few cisterns, will need to be drafted and shuttled up to the community. The homes are located on a hillside above the highway, and there is a small drainage that runs through the center of town. If an ignition comes from the highway below, a fire could spread quickly uphill, and especially up-drainage. A major concern for any responding emergency personnel is leftover unexploded ordinance from nearby Camp Hale. Most have been removed during cleanup of the site; however, some may have been missed on surrounding Forest Service lands. Another concern for the community is making sure that visitors to Vance's Cabin above the main community area are able to evacuate safely, should a fire occur. This concern could further increase if the proposed additional hut is added to the community area, and could require further clearing within the community area.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; limited mechanical treatments	200' around the home
Proposed Escape Route Thinning	2	The proposed roadside thinning/fuel break put forth by the county should be completed.	Hand felling and limbing; mechanical treatments where applicable	150 feet on each side of the road
MPB Removal* **	3	Remove all dead lodgepole trees within the community. The trees pose a safety risk to residents and infrastructure, including those that have already fallen because they may cause increased difficulty with fire suppression. Focus on roads before interior forested areas.	Hand felling and limbing; mechanical treatments where applicable	N/A

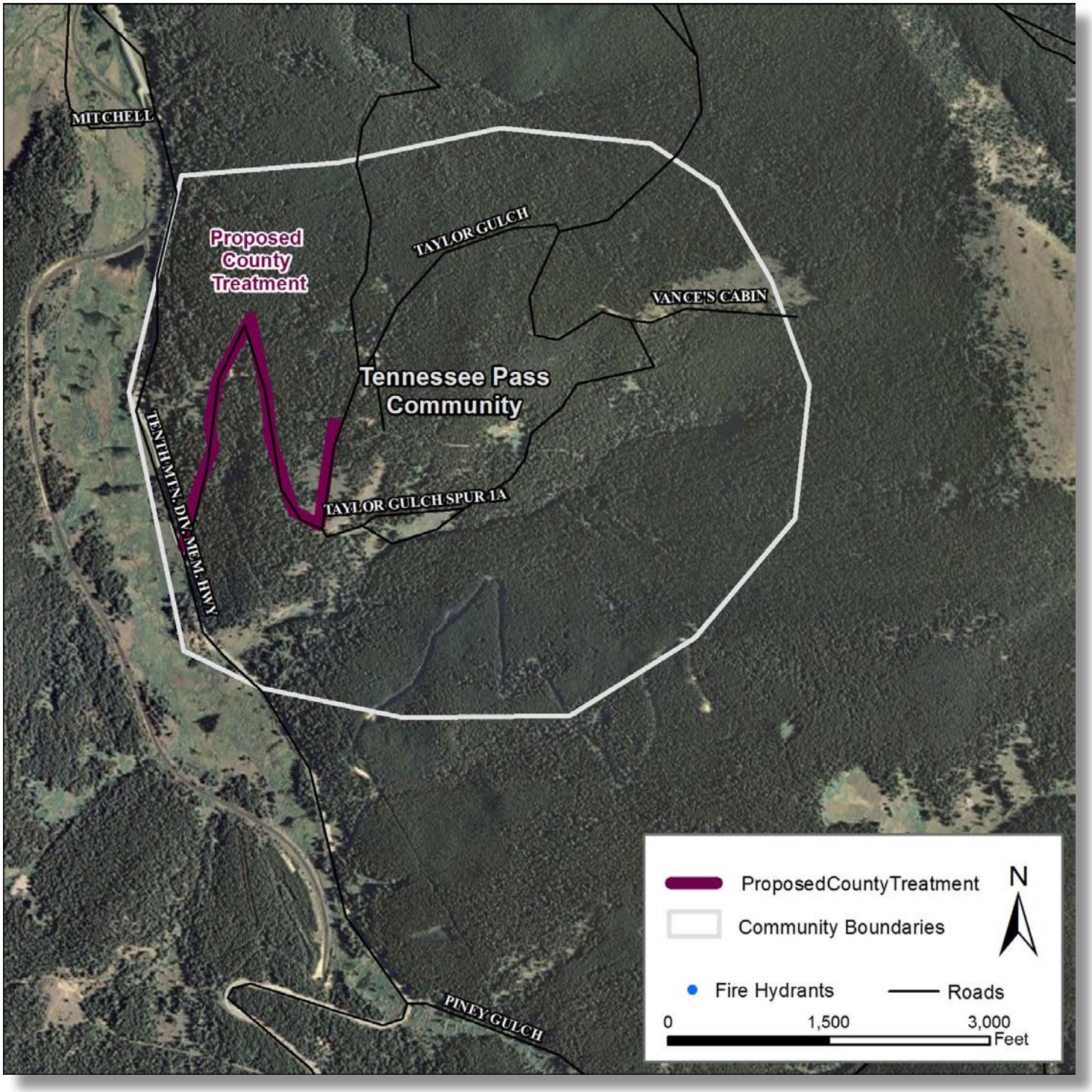
* See Page 28

Tennessee Pass

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Remove all standing dead lodgepole trees that are near structures, power lines, and roads.
		Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Because there are no hydrants in the area, install a 20,000-gallon cistern for fire suppression.
		Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5'above ground.
		Develop a community plan to provide proper maintenance to all community roads.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Identify all nearby water sources within and adjacent to the community, including cisterns and ponds. Make sure that they are visible.

HAZARD RATING **HIGH**



Timber Springs

Number of Structures	3
Utilities Above or Below Ground	Below ground
General Construction	Noncombustible siding; shake-shingle roofs
Average Lot Size	~35 Acres
Home Addresses	Not visible
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	<20'; <5%; paved
Emergency Vehicle Turnarounds	Not adequate
Water Supply	May be some small home cisterns
Proximity to Staffed Fire Station	~2 miles
Other Hazards	Homes in community accessed by narrow bridges, which are not rated

About the Community

The Timber Springs community does not have many homes and is located north of Interstate 70, northwest of Edwards. The community is located in a valley, with a creek running down the center. A narrow one-way-in-and-out road is the only access for the community. The road is on the east side of the creek, and homes are on the west side, meaning that all homes are accessed by private, unrated bridges. Homes are surrounded by watered, planted vegetation, as well as sage and grass located on the hillside above. All homes lack any defensible space protection. Aside from the water located in the creek and a few small developed ponds, no water is available in the community. Water can be drafted and shuttled from Wilmor Lake, which is at the base of the community.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Mowing; sage treatments	200’ around the home

* See Page 28

Timber Springs

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Because there are no hydrants in the community, consider installing a 20,000-gallon water tank for use by the fire department.
		Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Evaluate bridges to determine load-limits. Post these ratings to ensure over-weight vehicles do not use the bridges.
		Provide adequate turnarounds for fire apparatuses throughout the community.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **HIGH**

Ute Forest

Number of Structures	10
Utilities Above or Below Ground	Below ground
General Construction	Mixture of combustible/noncombustible siding, metal roofs
Average Lot Size	>20 acres
Home Addresses	Present; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	<20'; >15%; dirt
Emergency Vehicle Turnarounds	Not adequate
Water Supply	Not Present
Proximity to Staffed Fire Station	>5 miles
Other Hazards	Not included in district map books; extremely steep and narrow roads; non-year round population; lack of water

About the Community

Located above West Squaw Creek, Ute Forest can be accessed only via a very steep and narrow dirt road. A Type 3 engine may be able to access the community, but a Type 6 would be the preferred vehicle because of the road widths and curves. The houses within the community are scattered throughout, primarily on grassy hills and within aspen. Homeowners have not actively worked on defensible space around the homes. No hydrants or cisterns are available. Individual home cisterns may be present, but were not readily apparent. Because Ute Forest is not currently found in any of the district map books, it should be mapped and added as soon as possible. A fire in the area would likely move quickly and could impact homes before the fire department has a chance to respond. Adequate home construction combined with good defensible space is imperative for the community, as response may be delayed and water supply is lacking.

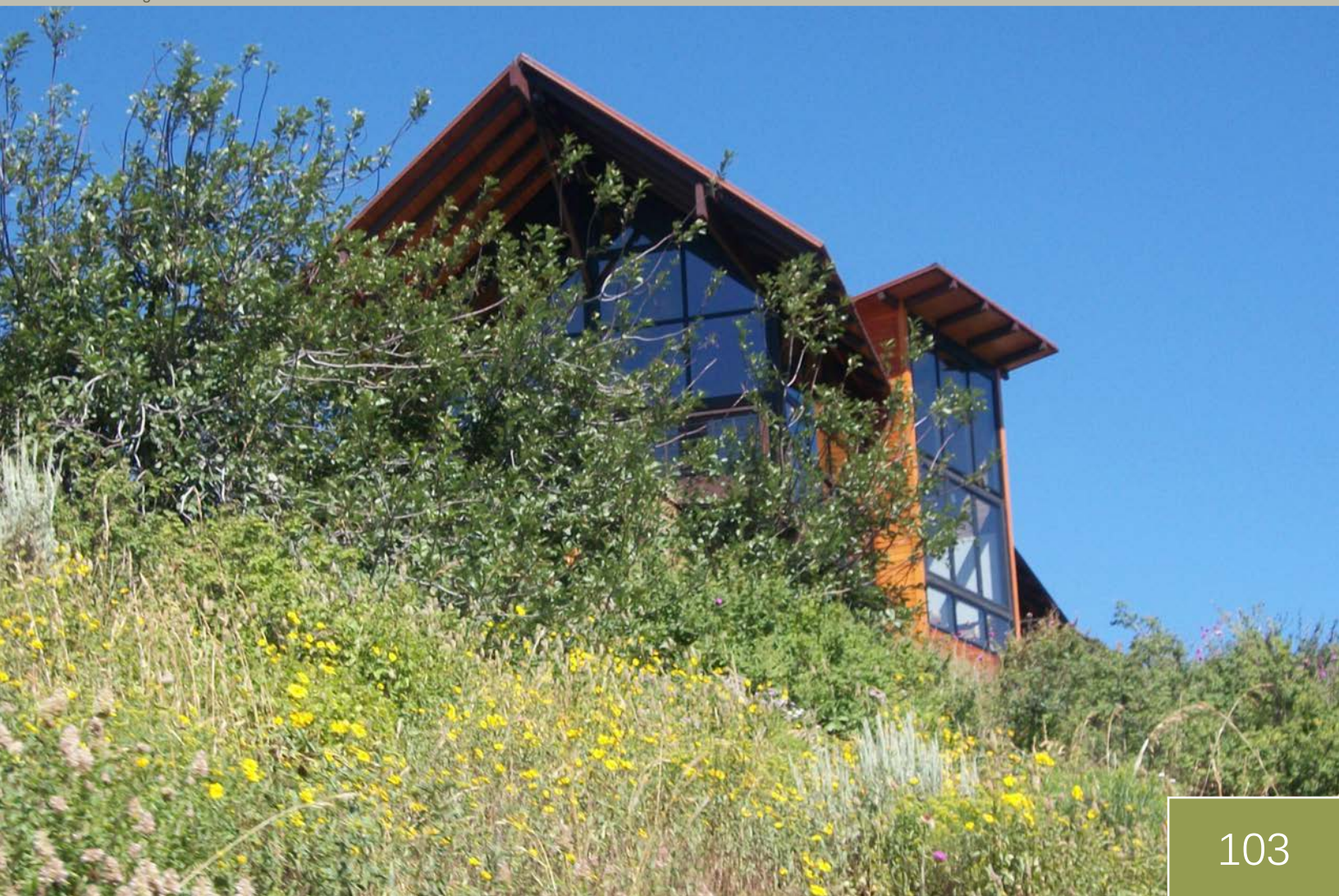
For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **VERY HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; sage treatments	200' around the home
Secondary Egress Creation / Roadside Thinning	2	Work with the adjacent landowner to create secondary egress route that connects to Royal Elk Road. This road should only be used for emergencies. Ensure the road is maintained and vegetation is reduced to a distance of at least 50' on each side. Gating the road is recommended.	Hand felling; sage treatments; mechanical treatments where possible	25 Acres; 3,700 feet
Drainage Fuel Breaks 1 and 2	3	The dense shrub and understory vegetation below the road could significantly limit access and egress. Fuel reduction in the drainage may be difficult because of steep slopes but is very important for life safety.	Hand felling because of slopes; mechanical treatments where possible	1: 4 Acres 2: 5 Acres

* See Page 28

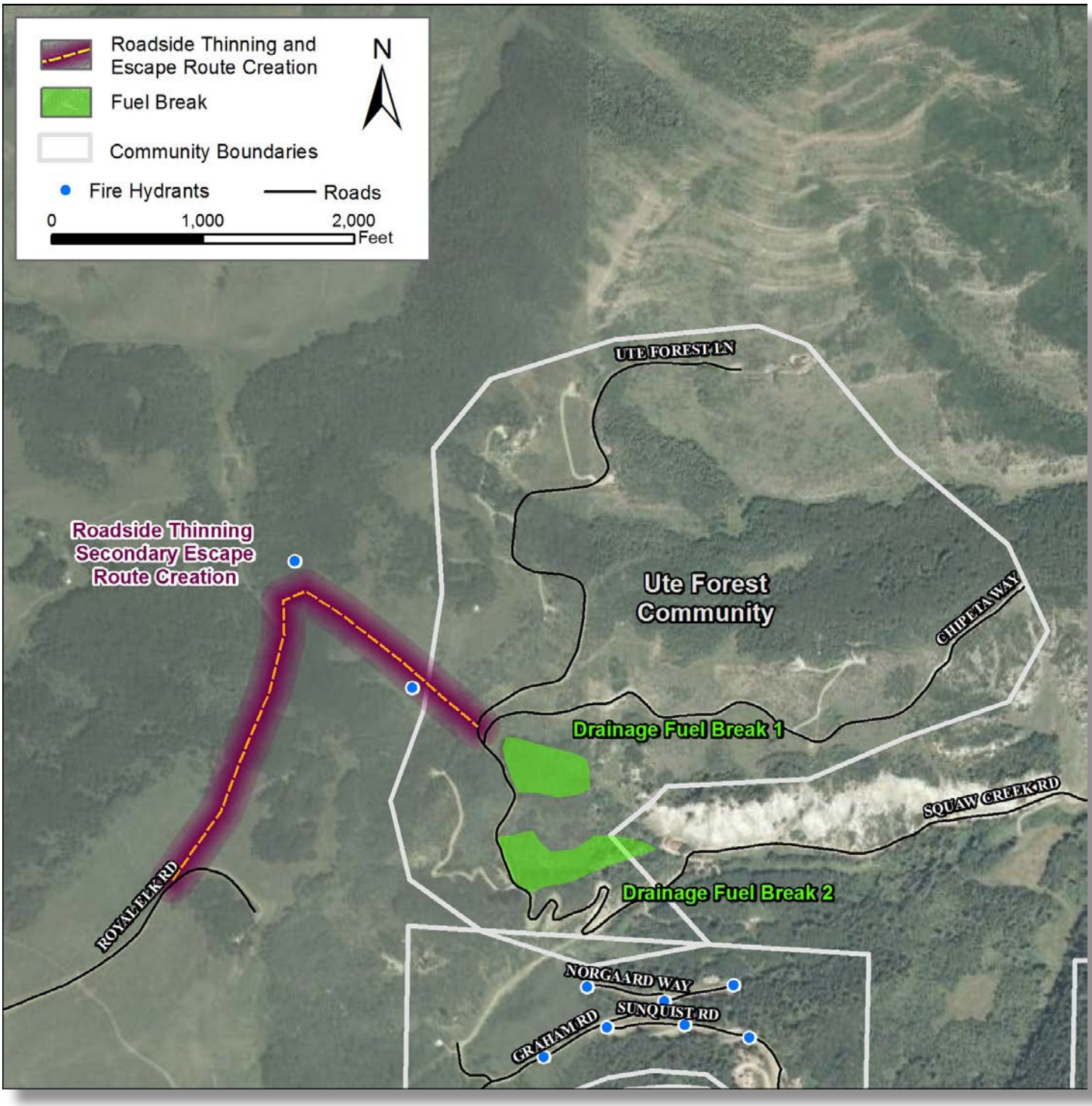


Ute Forest

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	This community has not been included in the map books that are on the responding apparatuses. This should be added as soon as possible.
		Because the roads are steep and narrow, as well as far from the nearest staff station, this community should consider a system to identify a wildfire threat and begin with early evacuation.
		There are no hydrants for this community, and houses do not have sprinklers. Install two 20,000-gallon water tanks for fire department use.
		Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' feet above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
Infrastructure	4	Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Provide adequate turnarounds for fire apparatuses throughout the community.
		Identify all water sources within the community, including cisterns and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **VERY HIGH**



West Lake Creek

Number of Structures	18
Utilities Above or Below Ground	Below ground
General Construction	Mostly noncombustible siding; metal and shake-shingle roofs
Average Lot Size	~35 acres
Home Addresses	Not visible in all areas; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	<20'; mostly flat; dirt
Emergency Vehicle Turnarounds	Adequate in some areas
Water Supply	Cisterns; ponds
Proximity to Staffed Fire Station	~7 miles
Other Hazards	Non-year-round residents; unrated culverts

About the Community

The community of West Lake Creek is located south of Edwards, off of the Lake Creek Road. Most homes are located in the valley area, with a few on the hillside above. The terrain is mostly rolling hills, with a few small drainages. Vegetation in the community includes aspen, spruce, Douglas-fir, grass along the valley bottom, and some beetle-killed lodgepole pine on the hillsides above. Most homes have done some defensible space work, but more could be done, including mowing grasses that surround homes. A fire could spread rapidly through the light, flashy fuels along the valley, before moving into the forested areas on the hillsides. Street signs are metal and reflective, but are not present along many of the back roads further back in the community.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, that firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; limited mechanical treatments	200' around the home
Ridge Road Roadside Thinning	2	Reduce fuel loadings along both sides of the road, taking into consideration fuels and home location. This will aid in the egress of residents by reducing fire intensity and smoke.	Hand felling and limbing near homes; mowing; limited mechanical treatments	40 Acres; 5,700 feet
Secondary Escape Route Improvement	3	Ensure that the highlighted road is kept clear and drivable for applicable residents to use as a secondary egress route.	Hand felling and limbing near homes; mowing; limited mechanical treatments; limited grading	7,100 feet
MPB Removal* **	4	Remove all dead lodgepole trees within the community. The trees pose a safety risk to residents and infra-structure, including those that have already fallen because they may cause increased difficulty with fire suppression. Focus on roads before interior forested areas.	Hand felling and limbing; mechanical treatments where applicable	N/A

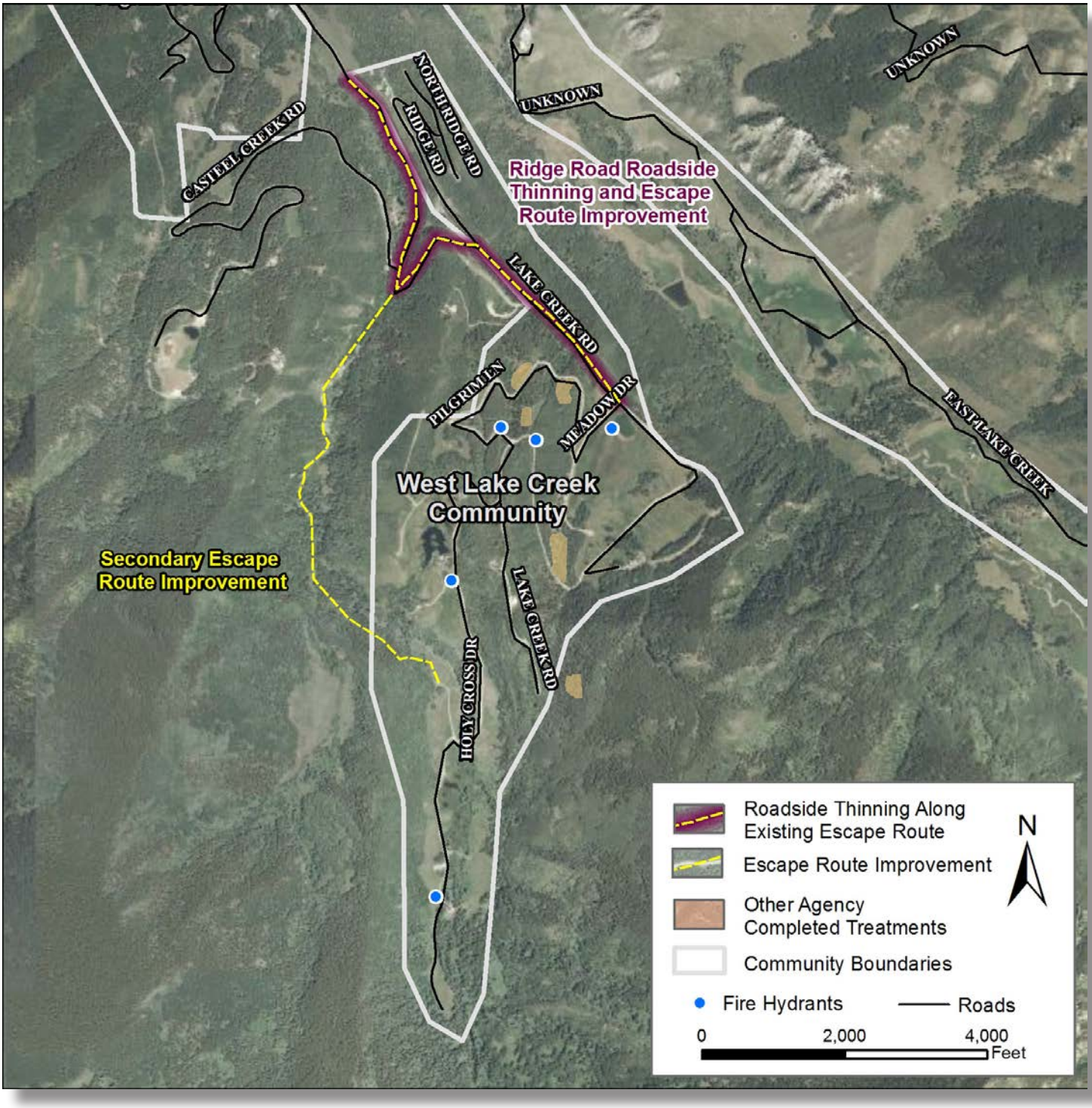
* See Page 28

West Lake Creek

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' feet above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
		Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.
Infrastructure	4	Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Provide adequate turnarounds for fire apparatuses throughout the community.
		Identify all water sources within the community, including cisterns and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **HIGH**



Whiskey Hill

Number of Structures	80
Utilities Above or Below Ground	Below ground
General Construction	Noncombustible siding; variety of roof classes, including a significant amount of shake-shingle roofs
Average Lot Size	<1 Acre
Home Addresses	Present; inconsistent; nonreflective
Dual Access Roads	One way in/out
Road Widths, Slope, and Surface	<20'; >10%; paved
Emergency Vehicle Turnarounds	Not adequate
Water Supply	Hydrants
Proximity to Staffed Fire Station	<1 mile
Other Hazards	High housing density; non-year-round residents; likely evacuation difficulties

About the Community

Whiskey Hill is located on the hillside above Eagle-Vail. The steep hillside is accessed via a narrow, steep one way road that travels up from Eagle-Vail. Access and egress during a wildfire are likely to be difficult depending on how many residents are present. Fuels in the area include aspen and beetle-killed lodgepole pine. Most homes in the community lack any defensible space and have shake-shingle roofs. Owing to its location near Eagle-Vail, there is also a high housing density within the community. Other noteworthy features include a golf course at the base of the hill, which could serve as a safety zone if needed, as well as a steep, narrow drainage that leads down the side of community. Street signs in the community are metal and are reflective. A cistern also is at the top of the road; the volume is unknown.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **VERY HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Hand felling and limbing near homes; mowing; limited mechanical treatments	200' around the home
Southern Fuel Break	2	Remove dead trees and thin further to create a fuel break behind the community. This will limit embering into the community as well as the potential spread into the surrounding forest from a structure fire.	Hand felling and limbing; mechanical treatments where applicable	36 Acres
MPB Removal* **	3	Remove all dead lodgepole trees within the community The trees pose a safety risk to residents and infrastructure, including those that have already fallen because they may cause increased difficulty with fire suppression. Focus on roads before interior forested areas.	Hand felling and limbing; mechanical treatments where applicable	N/A

* See Page 28

Whiskey Hill

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Because the road is steep and narrow, work on early evacuations for residents in the area. The amount of traffic leaving makes the situation dangerous and difficult for residents and firefighters.
		Mark the volume on the cistern that sits at the top of the community.
		Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' feet above ground.
		Develop a community plan to provide proper maintenance to all community roads.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Identify all water sources within the community, including cisterns and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **VERY HIGH**

Wildwood/Wildridge

Number of Structures	383
Utilities Above or Below Ground	Below ground to homes, with major overhead power lines running through
General Construction	Mostly noncombustible siding; mostly high fire resistant roofs, with some shake-shingle roofs
Average Lot Size	<1 Acre
Home Addresses	Present; inconsistent; nonreflective
Dual Access Roads	Two+ ways in/out
Road Widths, Slope, and Surface	>24'; >10%; paved
Emergency Vehicle Turnarounds	Not adequate in all areas
Water Supply	Hydrants with good pressure
Proximity to Staffed Fire Station	>5 miles
Other Hazards	Major overhead power lines; high housing density

About the Community

The community of Wildwood/Wildridge includes the two different subdivisions and is part of the Town of Avon. It is located on the hillsides north of the town center. Terrain in the community is steep, and a number of steep drainages are throughout, all which have homes on the edges of them. The main vegetation types in the community are grass and sage. These light, flashy fuels will actively promote rapid rates of spread, especially as a result of the steep terrain within the community. Most homes have some defensible space, due to the presence of watered lawns and some mowing of grasses and sage. However, more work needs to be done to protect all of the homes in the community. Street signs are metal and reflective, but they are located on combustible, wooden posts.

For all of the homes in the study area, properly implemented defensible space and Firewise home construction are the most important recommendations for home survivability. Due to limited firefighting resources, especially during the early stages of an expanding wildfire incident, high home density, and/or long response times, individual firefighting entities may not be able to stay and protect each home. In order to survive a passing flame front, a home will need good defensible space and home construction. Often, homeowners will assume that because they have adequately constructed their homes from noncombustible materials and have cleared vegetation around the structures, firefighters will be able to save their homes. However, defensible space needs to be maintained and re-assessed throughout the fire season. The following fuels treatment and general wildfire mitigation recommendations provide a good start for properly protecting one's individual home and the community as a whole. More in-depth information on home construction, defensible space, preparedness planning and evacuation, infrastructure, and water supply can be found in Appendix A.

HAZARD RATING **HIGH**

Fuels Treatment

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual homes. See Appendix A for details.	Mowing; sage treatments	200' around the home
Linked Defensible Space	2	By having multiple landowners work together on their defensible space, a larger fuel break will be created, helping protect structures from the dense shrub vegetation on the slopes below.	Sage treatments; mowing	25 Acres; 2 miles

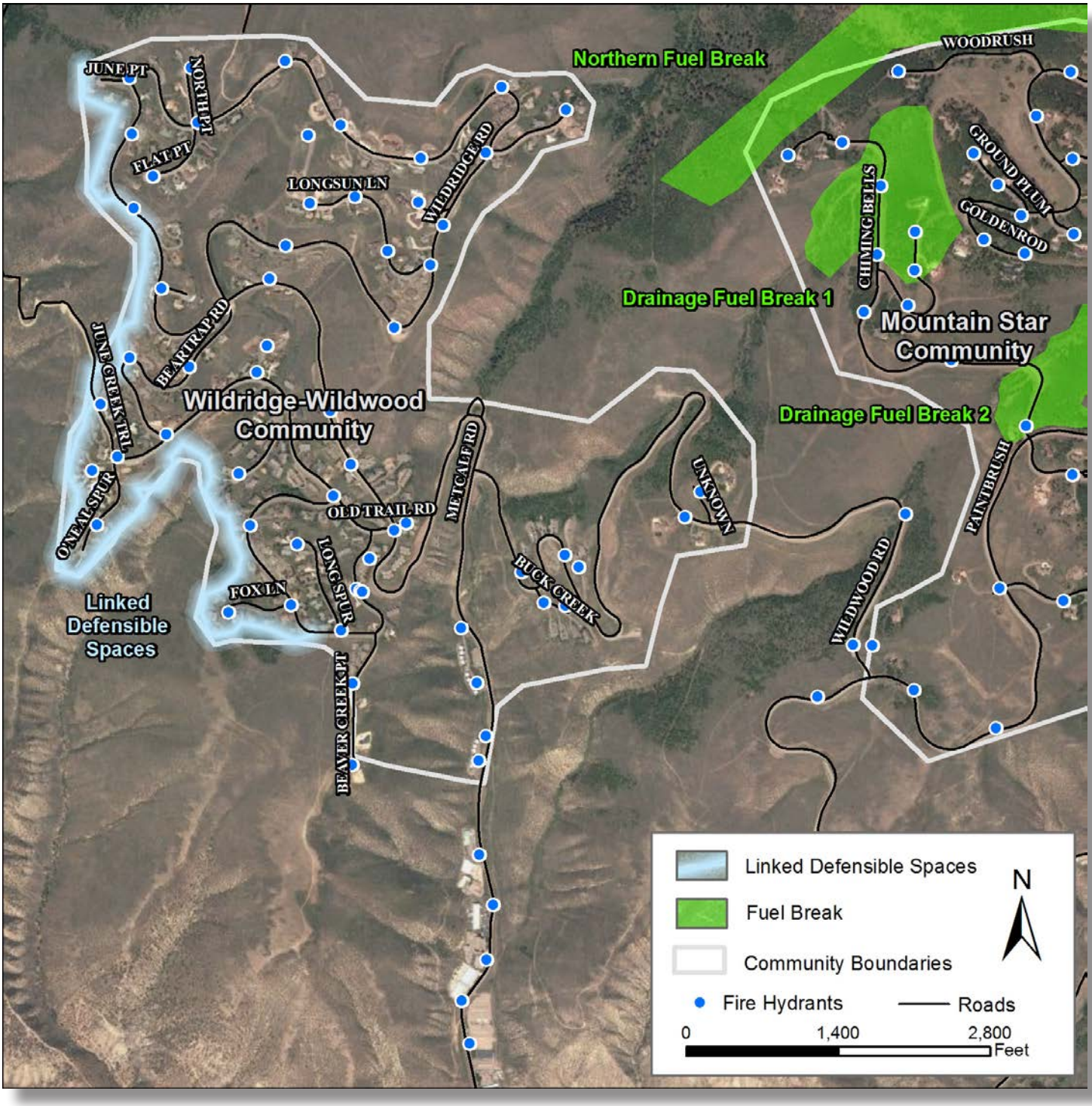
* See Page 28

Wildwood/Wildridge

Defensible Space & Fuel Reduction Projects

Category	Priority	Description
Home Construction	1	Discourage the use of combustible materials for decks, siding, and roofs, especially where homes are upslope from heavy vegetation.
		Replace any shake-shingle or slab-wood siding and roofs with noncombustible types.
		Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers and kept clean of flammable materials, especially where such openings are located on slopes above heavy fuels.
Landscaping/Fuels	2	Clean leaf and needle litter from roofs and gutters and away from foundations.
		Thin vegetation along side roads and driveways. This is especially important for narrow driveways and road segments, and for any areas where ravines with heavy fuels are below the access. Focus on removing vegetation in drainages that cross roads.
		Remove wood piles and any flammable yard clutter to at least 30'from structures and propane tanks. Wood piles should be located uphill or even with homes, never downhill.
		Encourage individual landowners to mow fuels near homes and along roadways and fence lines during times of high fire danger.
Preparedness Planning/ Evacuation	3	Add reflective addressing to all driveways or homes. A good guideline is to use all metal white markers that are 4" in width on a green background. These should be placed 3-5' feet above ground.
		Develop an evacuation plan for the community, including identifying escape routes and an evacuation center.
Infrastructure	4	Provide adequate turnarounds for fire apparatuses throughout the community.
		Ensure that all gates in the community are removable and/or have access codes that are known to all residents and the FPD.
		Identify all water sources within the community, including hydrants, cisterns, and ponds. Make sure that they are visible, maintained, and operable.

HAZARD RATING **HIGH**



Areas of Special Interest & Critical Infrastructure

AREAS OF SPECIAL INTEREST & CRITICAL INFRASTRUCTURE

Areas of Special Interest (ASIs) are places within the CWPP study area that could be threatened from wildfire and have a social or economic value that is not based on residential development. Unlike communities, ASIs are not given hazard ratings. Frequent candidates for ASIs include recreation areas, such as parks, reservoirs, ski areas, and designated open space. Guest ranches, church camps, RV parks, and other large acreage recreational camps that have a significant, but temporary, population are typically included as ASIs. Also included as an ASI is critical infrastructure, such as communication arrays, that is vital to the local community. ASIs are identified separately from communities because of they either lack or have low permanent population densities.

Recommendations for ASIs and critical infrastructure follow the accompanying write-ups. These recommendations are not inclusive and should be utilized in conjunction with those planned by local utility companies and guest ranches.

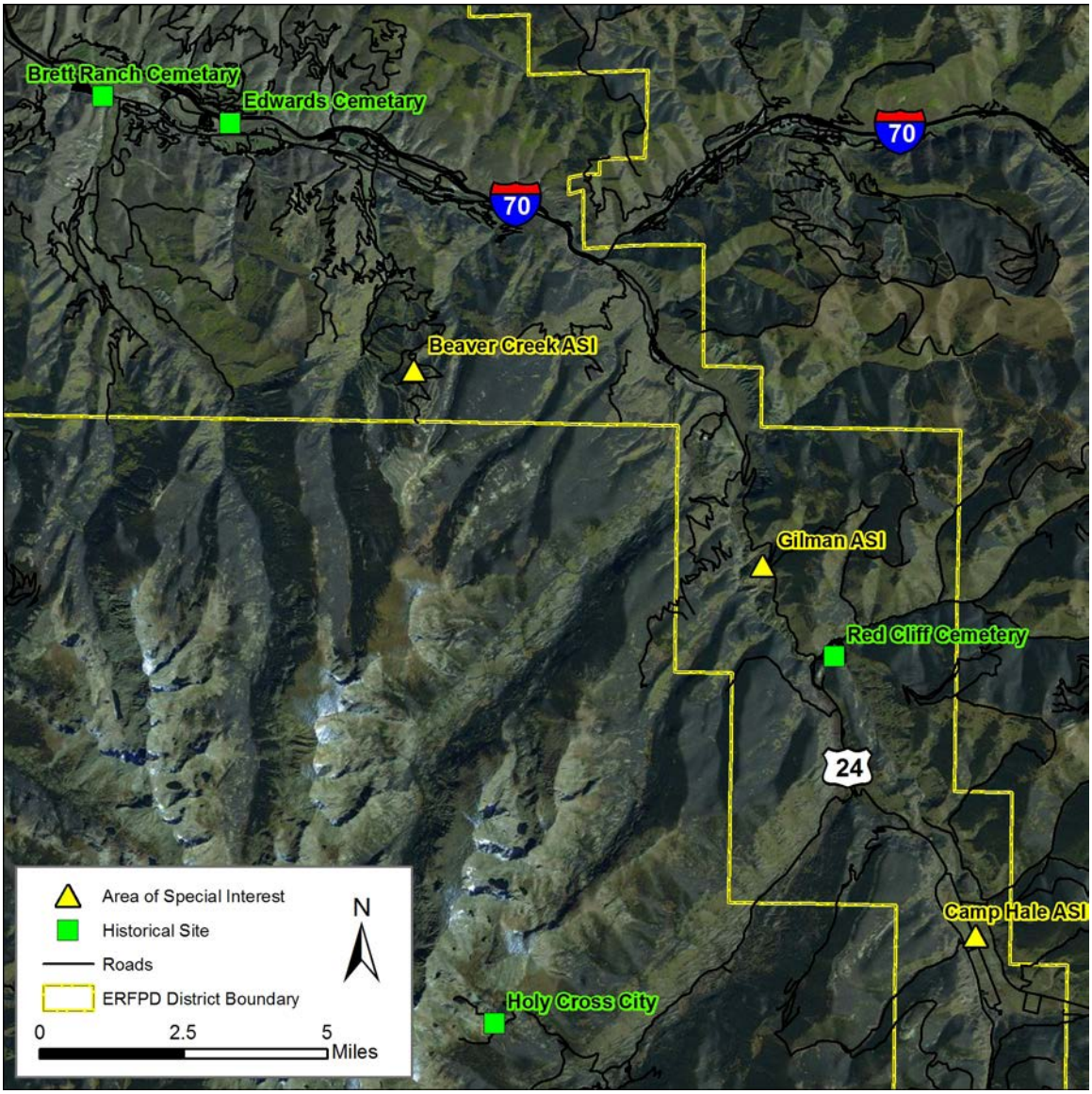


Figure 7. Areas of special interest and historical sites in the ERFPD area.

Beaver Creek Ski Resort

The Beaver Creek Ski Resort is located south of Avon, on lands managed by the White River National Forest through a special use permit with the U.S. Forest Service. The resort area is a popular year-round tourist destination, especially in the summer and winter months. Numerous structures are on the resort area, including lodges, stables, maintenance facilities, and lift infrastructure. Precautions should be taken to minimize the effects of wildfire in order to reduce damage to structures, as well as impact to current and future visitors.

General Recommendations

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space around individual structures and facilities. See Appendix A for details.	Mowing; sage treatments	100' around the perimeter
Landscaping/Fuels	2	Follow the recommended Landscaping/ Fuels guidelines found in Appendix A.	N/A	N/A
Preparedness Planning	3	Follow the recommended Preparedness Planning guidelines found in Appendix A.	N/A	N/A

PRI Priority
* Sage treatment options are discussed in Appendix A.
** Defensible space distances will vary by property based on slope and fuels.

Areas of Special Interest

Camp Hale

Camp Hale is a historic and recreation site located between Red Cliff and Leadville, adjacent to Highway 24. The site was originally used by the U.S. Army as a training facility for what later became the 10th Mountain Division, as well as a prisoner-of-war camp. Later, Camp Hale was used by the Central Intelligence Agency (CIA) as a training area for Tibetan guerrillas. Today, the site has a popular private lodge, as well as camping facilities managed by the U.S. Forest Service.[1] Due to the historic significance of the area, as well as its popularity with visiting recreationists, precautions should be taken to minimize the effects of wildfire to the area. Responding emergency personnel should also be aware of any unexploded ordinance left in the area, which may have been missed during cleanup efforts. **See Appendix E for more information.**

1 Hagen, Monys. Metropolitan State College of Denver. "Camp Hale History." http://www.mscd.edu/history/camphale/res_005.html.

General Recommendations

Name	PRI	Description	Methods	Acres*
Preparedness Planning	1	Use of the pre-designated plan for responding to the area should be of utmost importance due to the presences of UXOs in the area. Planning should also include how to evacuate recreationists.	N/A	N/A

PRI Priority
* Mechanical treatments in timbered areas include all varieties of logging equipment.
** Defensible space distances will vary by property based on slope and fuels.

Gilman

The town of Gilman is located between Minturn and Red Cliff, west of Highway 24. Once a thriving town centered on lead and zinc mining, the Environmental Protection Agency (EPA) ordered it to be immediately abandoned in 1984 due to high levels of toxic contaminants. It is currently a ghost town that is off-limits to the public, though the area was recently scheduled to become part of the Battle Mountain development, which is currently stalled.[1] Firefighters responding to the area will encounter a recent ghost town, with a high density of homes and other structures. Responders should contact area officials and/or the property owner before engaging in any suppression actions due to any contaminants that may still be present in the area.

1 "Gilman, Colorado." Wikipedia. July 19, 2007. http://en.wikipedia.org/wiki/Gilman,_Colorado.

General Recommendations

Name	PRI	Description	Methods	Acres*
Landscaping/Fuels	1	Fuel treatments may be considered surrounding the community. Follow the recommended Landscaping/Fuels guidelines found in Appendix A.	N/A	N/A
Preparedness Planning	2	A plan should be developed for responding to the Gilman area due to the potential for hazardous materials in the area. A detailed map of the area should also be prepared.	N/A	N/A

PRI Priority
* Mechanical treatments in timbered areas include all varieties of logging equipment.
** Defensible space distances will vary by property based on slope and fuels.

Areas of Special Interest

Historical Structures

Eagle County's rich history and culture is preserved in many historic buildings. Mining in particular played a predominant role in the growth and development of the area around the fire protection district as it is known today. Many historic mine structures remain intact in the county, but they are vulnerable to wildland fire. Some of the at-risk historic sites in the study area are listed below. These historical site locations are also visible in Figure 7.

- Brett Ranch Cemetery
- Holy Cross City
- Red Cliff Town Cemetery

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space is recommended for all historical structures. Since they are not always a priority for protection and/or known about in the initial attack stages of an advancing wildfire, they could greatly benefit from the additional protection. See Appendix A for details.	Mowing; sage treatments; hand felling and limbing	100' around the perimeter
Preparedness Planning	2	All historical structure locations should be mapped in an easily-readable format and available for all incoming resources.	N/A	N/A

PRI Priority
* Sage treatment options are discussed in Appendix A.
** Defensible space distances will vary by property based on slope and fuels.

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Critical Infrastructure

CRITICAL INFRASTRUCTURE

A variety of critical infrastructure occurs throughout the study area, and any impact to these areas could have severe economic and safety implications. Specific to the study area, critical infrastructure includes communication towers, power lines and substations, which serve a vital function during emergency operations. Many areas that contain these important pieces of infrastructure are currently at risk to wildland fire. These at-risk facilities are shown below in figure 9. Recommendations for reducing wildfire risk in the accompanying write-up. Information on other types of infrastructure in the study area can be found in the values at risk section at the beginning of the document on pages 7-8.

Regional Assets at Risk

- Bellyache Communication Tower
- Lower Dowd Communication Tower
- Wolcott Communication Tower
- Major Power lines
- Substations

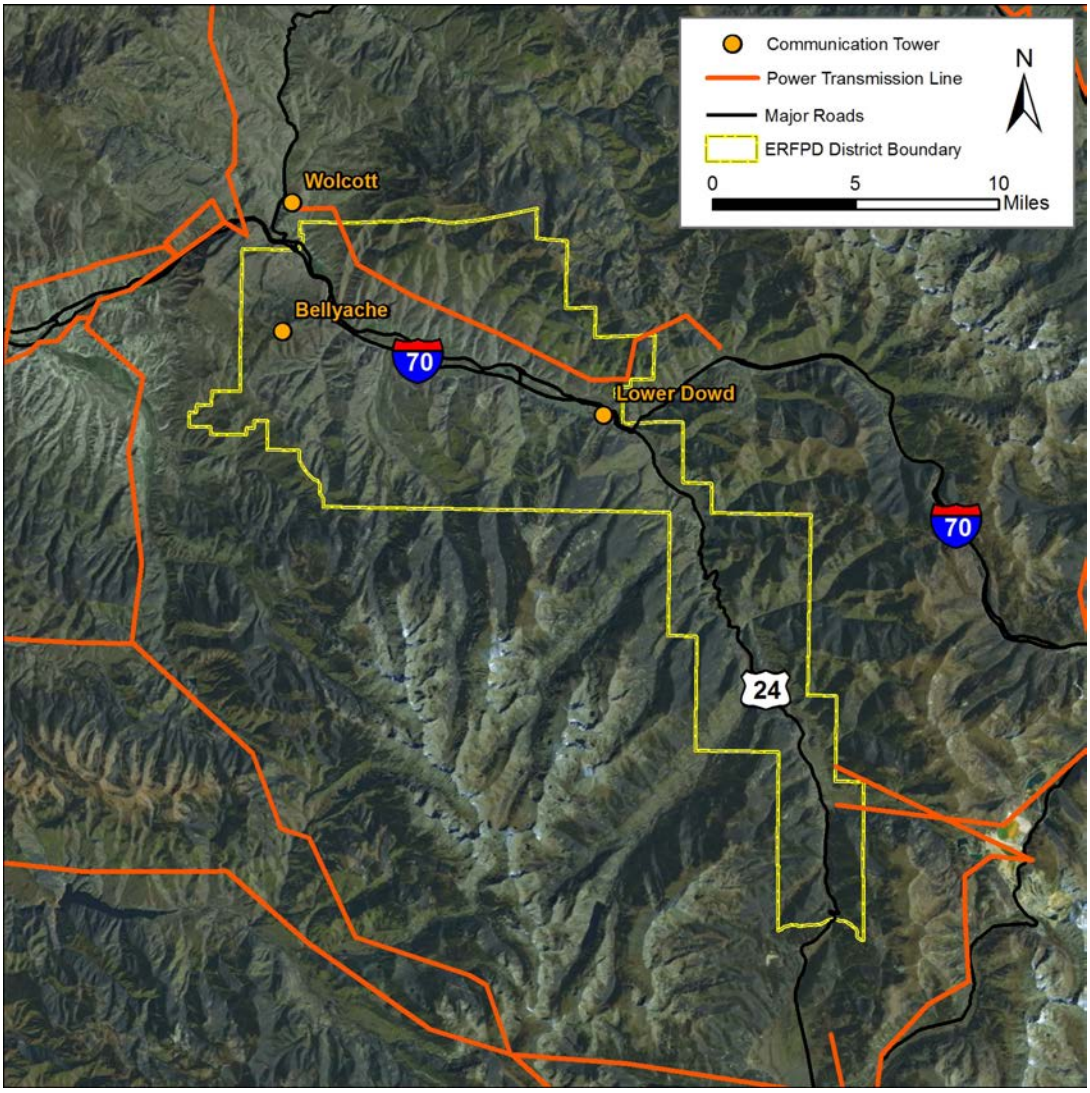

Figure 8. Critical infrastructure in the ERFPD area.

ERWSD also has facilities that are vulnerable to wildfire hazards, either by virtue of access to the facility or the proximity of fuels to antennas, solar collectors or electrical panels. Due to the sensitive nature of these facilities, no location information is provided. The fire department should work with ERWSD to generate a department-only map of the assets. These facilities are listed below.

ERWSD Assets at Risk

Arrowhead BPS 1	Edwards Tank 1
Avon Tank 1	Greystone Tank
Bachelor Gulch Tank 1	Mountain Star BPS 1
Beaver Creek Tank 1	Mountain Star Tank 4
Berry Creek Tank 1	Potato Patch BPS
Berry Creek Tank 2	Red Cliff Wastewater Plant
Buffehr Creek BPS	Red Cliff Water Plant
Booth Fall BPS	Spraddle Creek BPS
Cordillera East Tank 1	Strawberry Park BPS 1
Cordillera East Tank 2	Strawberry Park Tank 1
Cordillera East Tank 3	Strawberry Park Tank 2
Cordillera West Tank 1	Vail Tank 4
CVC Tank 1	Vail Tank 7
Eagle-Vail Tank 1	Wildridge BPS 1
Eagle-Vail Tank 2	Wildridge Tank 2

CRITICAL INFRASTRUCTURE RECOMMENDATIONS

Name	PRI	Description	Methods*	Acres**
Defensible Space	1	Defensible space is recommended for all infrastructure located near hazardous fuels.	Hand felling and limbing near homes; mowing; sage treatments	~200’
Thin Below Power lines	2	Reduce fuels below power lines in areas of heavy fuel loadings.	Hand felling and limbing; mechanical treatments where slope and access allows	N/A
Preparedness Planning	3	All infrastructure locations should be mapped in an easily-readable format and made available to ERFPD.	N/A	N/A

Communities With Existing CWPPs

COMMUNITIES WITH EXISTING CWPPS

Within ERFPD, the areas of Arrowhead, Bachelor Gulch, Beaver Creek, and Cordillera already have existing CWPPs. Over a period of several years, Anchor Point was contracted to complete the plans for the areas, which included identifying individual communities, determining hazard and risk, and generating recommendations. The communities identified were given wildfire-hazard ratings between low and extreme. In addition to community ratings, projects from the forest management plan and additional treatments were developed. For complete descriptions of the communities, how the ratings were determined, and all of the recommendations, see the CWPPs available from the CSFS website: http://csfs.colostate.edu/pages/CommunityWildfireProtectionPlans.html.

While revisiting all of the communities in order to create the initial plans, it was noted that several of the gate codes had been changed. The fire department was not given these updates, and, as a result, phone calls had to be made to gain access. It is imperative that the fire department have current codes at all times.

Beaver Creek CWPP Update

In 2003, the Beaver Creek Resort Company contracted with Anchor Point for a wildland fire hazard and risk analysis. As a result, a comprehensive forest management plan was developed and completed in May 2004. Three management compartments of lodgepole pine were identified for fuels reduction and forest health thinning. In addition to the forest management plan, in December 2007, the CWPP for Beaver Creek was completed. The CWPP identified seven communities within the study area: Strawberry Park, Beaver Creek Drive, Elk Track Court, Wayne Creek, Holden, Offerson/Greystone, and Larkspur/Chateau. The CWPP document is posted at this website: http://csfs.colostate.edu/pages/documents/BeaverCreekCWPP.pdf.

Although many of the fuels reduction projects were completed, numerous tasks remain. Exiting relevant recommendations are found in Table 8. Maps of these projects can be found in the reports accessed from the link provided above.

Community	Rating
Wayne Creek	Low
Holden	Low
Elk Track Court	Low
Offerson/Greystone	Low
Larkspur/Chateau	Low
Beaver Creek Drive	Moderate
Strawberry Park	Moderate

Table 7. Ratings of Beaver Creek communities.

Unit	Acres	Completed
Strawberry Park 2B		2007
Strawberry Park Unit 3		2007
Strawberry Park 1B-2	1.6	2008
Strawberry Park 1C-2	3.4	2008
Strawberry Park 1D-1	0.5	2009
Strawberry Park 1E-1	1.1	2009

Table 8. Summary table of recommended and completed fuels treatments for Beaver Creek.

Two previously recommended fuels treatments have yet to be done. In all, an additional 18.5 acres are recommended for completions. Greater detail of these projects is found in the Beaver Creek Forest Management Plan, available by contacting Anchor Point.

Recommended Unit	Acres
Beaver Creek Drive	14.1
Holden Road Shrub Treatments	4.4

Table 9. Uncompleted projects identified in the Beaver Creek CWPP

Recommendation	Priority
Reflective address markers on homes and street in the following communities: Holden Wayne Creek Strawberry Park	High
Evacuation route from Strawberry Park to Bachelor Gulch (see Bachelor Gulch recommendations)	High
Lower McCoy Park Road – retrofit gate	Low
Replace wooden street signs and poles	High
Identify a nearby evacuation center	High
Create an evacuation plan for communities	High
Reverse 911	High
Response drills	Moderate
Pre-attack plan	High

Table 10. Non-fuel related recommendations from the Beaver Creek CWPP

Bachelor Gulch CWPP Update

The initial Bachelor Gulch CWPP was written in 2007. The document in its entirety can be found online at http://csfs.colostate.edu/pages/documents/BachelorGulchCWPP.pdf. The scale of the report is much smaller than the ERFPD. As a result, recommendations are more detailed.

Only four communities are identified within the Bachelor Gulch study area. One is rated as low, two as moderate, and one as high. Similar to the other existing plans in the FPD, Bachelor Gulch has completed many of the fuels projects in the study area, but many of the other nonfuel-reduction recommendations remain incomplete. These recommendations are still valid and should be addressed. Since the original CWPP, MPB has continued to kill trees within the communities. Dead trees, especially those along roads pose a risk to individuals in the vicinity. Priority should be given to clearing dead lodgepole that could impact roadways and trails.

Since 2008, a minimum of 400 additional trees have been identified as having been attacked by the MPB. At this point, it is likely that this number is well above 400 trees. Individual tree surveys were not completed after 2009, so there is no definitive number.

Community	Rating
North Arrowhead	Low
Arrowhead Drive	Moderate
Cresta	Moderate
Trailside	High

Table 11. Ratings of Bachelor Gulch communities.

Unit	Acres	Completed
Daybreak Ridge Safety Zone Unit A	2.9	2010
Elk Horn Ridge Service Road Fuel Treatments Unit C	7.6	2009
Daybreak Ridge Fuel Treatments Unit D	5.6	2008
Tall Timber Fuel Treatment Unit E	6.0	2008
Ritz-Carlton Safety Zone Unit F	2.8	2008
Buckhorn Fuel Treatment 2 Unit H	2.0	200?
McCoy Park Road Fuel Treatment Unit B	3.3	2009

Table 12. Summary table of recommended and completed fuels treatments for Bachelor Gulch.

Recommended Unit	Acres
Buckhorn Fuel Treatment 1 Unit G	2.0

Number of MPB Trees Removed	Year
546	2008

Table 13. Uncompleted fuels project in Bachelor Gulch.

Recommendation	Priority
Get rid of wood street signs along Daybreak Ridge	High
Street markers on homes and drives	High
Retrofit gate for fire department access on service road between Daybreak Ridge to Strawberry Park	High
Shaded fuel break where service road crosses drainage	High
Identify an evacuation center	High
Create an evacuation plan for communities	High
Reverse 911	High
Perform response drills	Moderate
Daybreak Ridge Safety Zone (2.9)	High
Forest Management Plan	High
MPB dead tree removal	High

Table 14. Non-fuel related recommendations from the Bachelor Gulch CWPP.

Arrowhead CWPP Update

The Arrowhead CWPP was completed in July 2008. Four communities were identified and given hazard ratings, seen in table 15 below. The CWPP document in its entirety can be found at http://csfs.colostate.edu/pages/documents/ArrowheadCWPP.pdf. There were numerous recommendations made in the initial document, many of which have been acted upon, but many remain relevant. The majority of the recommendations revolving around replacing address markers and street signs are still valid. Wooden street signs and nonreflective addresses are still an action item on the list.

Community	Rating
North Arrowhead	Low
Arrowhead Drive	Moderate
Cresta	Moderate
Trailside	High

Table 15. Ratings of Arrowhead communities.

Recommended Unit	Acres
Cresta Road Fuel Treatment Unit A	12.0

Table 17. Uncompleted fuels project identified in the Arrowhead CWPP.

Recommendation	Priority
Reflective address markers on homes and street	High
Evacuation route from Cresta Road to Bachelor Gulch, inspect annually	High
Cresta Road Bypass: inspect annually	High
Replace wooden street signs and poles	High
Identify a nearby evacuation center	High
Create an evacuation plan for communities	High
Reverse 911	High
Response drills	Moderate
Pre-attack plan	High
Forest Management Plan	High
MPB – dead tree removal	High
Program for hydrant testing	Moderate
Mitigation plan for Vail Resorts Developer	High
Evaluate McCoy Creek to become part of Trailside, or its own community	High
Consider adding McCoy Springs to Cresta or perhaps its own community	

Table 19. Non-fuel related recommendations from the Arrowhead CWPP.

Unit	Acres	Completed
Trailside Fuel Break Unit B	2.0	2008
West Arrowhead Drive Fuel Break Unit C	6.2	2008
Cresta Fuel Break	16.8	2008

Table 16. Summary table of recommended and completed fuels treatments for Arrowhead.

Other Recommendations

Trailside Fuel Break (Unit B): The main path should be mowed twice during the summer months to keep the grass short and to preserve the fuel break.

Forest Ecosystem Management Plan: An assessment of the areas' forests is recommended. This would give a baseline of forest health and allow Arrowhead to take a proactive approach to sustain the forests. The mountain pine beetle epidemic is well-known and has had a significant impact to the entire area. Arrowhead does not have a lot of lodgepole pine; however, there is an abundance of quaking aspen and lesser amounts of spruce and fir. The aspen is in decline across the state, and this is evident in Arrowhead. Engelmann spruce and sub-alpine fir are also being affected by insects and disease. A healthy forest is vital to stave off these pathogens.

A forest health study would include:

- Forest Cruise
  - Forest and vegetative species
  - Density and stocking levels
- Insect and Disease Survey
- Wildlife Census
- Soil Types
- Weed Identification and Mapping
- Recommendations and Prescriptions

Table 18. Additional recommendations from the Arrowhead CWPP that are still applicable and not yet completed.

Cordillera CWPP Update

Anchor Point completed the Cordillera CWPP in August 2004. The communities identified and their ratings are listed below. Following the recommendations table (Table 21), is a review of the actions that the Cordillera Property Owner's Association has accomplished since the CWPP creation. The Cordillera CWPP was done at a very fine scale, and, as a result, 28 communities were identified (Table 20). The detailed update was provided by the property owner's association. Similarly, although the Cordillera community has completed many projects and actions, including fuels treatments and changes in building regulations, not all residences have followed through. The list of recommendations from the original CWPP has been included to continue to help guide actions. Maps can be found in the original CWPP at http://csfs.colostate.edu/pages/documents/CordilleraCWPP.pdf.

Community	Rating
Club Cottages	Low
Bentgrass	Low
Martingale	Low
Gold Dust/Murphy's Creek	Moderate
Cimarron	Moderate
Bearcat	Moderate
Summit Fairways	Moderate
Founder's Preserve	Moderate
Kensington Green	High
Bearden Meadows	High
Andorra/Central Divide	High
Red Draw Meadows	High
Settler's Woods	High
Elk Woods & Springs	High
Summit Club	High
Granada Glen	High
Settler's Loop	High
Territories	High
Saddleridge	Very High
The Timbers & Fairways	Very High
Granite Springs	Very High
Grey Hawk	Very High
Casteel Ridge	Very High
The Aspens/Black Bear/Whitaker Ponds	Very High
Red Draw & Peregrine	Very High
Webb Peak & Summit Springs	Extreme
Redtail Ridge	Extreme
El Mirador	Extreme

Table 20. Community ratings from the Cordillera CWPP.

UPDATE OF WORK COMPLETED

Cordillera is an unincorporated community of 910 properties located in Eagle County, Colorado. The Cordillera Property Owners Association (CPOA) and the Cordillera Metro District (CMD) work together to administer and manage day-to-day operations in Cordillera. This document is intended to serve as the 2011 update for Cordillera's Community Wildfire Protection Plan (CWPP). It is the first update to the plan written by Anchor Point in 2004. The update has three sections. Section I addresses general issues that are frequently referenced by Anchor Point, such as roofing materials. Section II will review each neighborhood as identified by Anchor Point in 2004. Section III is a list of all work projects since 2004.

In October 2003, Cordillera entered into an agreement with the Anchor Point Group to conduct a "Wildfire Hazard and Risk Analysis." The analysis from Anchor Point was submitted to Cordillera in August 2004 as the "Wildland Urban Interface Community Fire Plan." This plan, which pre-dates the current format for a formal CWPP, was accepted by Eagle County and the Colorado State Forest Service as Cordillera's CWPP in 2004.

Cordillera has been recognized as a Firewise Community since 2005.

SECTION I – GENERAL ISSUES

Roofs

The original Design Guidelines for Cordillera specified that structures in the geographic areas Ranch and Summit must have cedar-shake roofs. In the 2004 document, Anchor Point frequently references the hazards of combustible roofs. In 2005, Cordillera's Design Guidelines were revised so that combustible

roofing materials, including treated cedar shakes and Class A assemblies, were prohibited on new structures. Remodels and replacement roofs that affect more than 25 percent of a roof must replace the entire roof with approved noncombustible roofing material. The Cordillera Design Review Board (DRB) has reviewed and approved several noncombustible roofing materials. Most of these products are plastic versions that resemble cedar-shake shingles.

Construction Standards

Since 2004, all new construction has met Eagle County wildfire regulations for construction and defensible space. The Eagle County Wildfire Specialist issues a hazard rating for the property prior to the county issuing a building permit. Wildfire hazards must be mitigated before the permit is issued. The property owner may have the option to mitigate natural hazards to a desired hazard level, which might allow more leeway in building material selection. The hazard rating of the property will dictate the Eagle County's requirements for building materials. Cordillera does not get involved with the selection of construction materials unless addressed by the Cordillera Design Guidelines.

Hazard Assessments

Anchor Point recommended that Cordillera conduct hazard assessments for each parcel in Cordillera. Cordillera staff has conducted wildfire hazard assessments on all Cordillera properties. Cordillera utilized NFPA 1144 for properties with structures and Eagle County's assessment criteria for vacant lots. Assessments are on file at Eagle County, ERFPD, and Cordillera.

Mandatory Private Property Wildfire Mitigation

In 2006, the CPOA passed a resolution that required all Cordillera properties to address wildfire hazards according to a five-year schedule. 2011 is year five of the five-year cycle. Properties will be required to maintain the wildfire mitigation and inspected according to the same five-year schedule. The resolution requires all properties to develop wildfire zones one, two, and three, according to Eagle County and Colorado State Forestry standards except that Cordillera requires properties sized three acres or under to mitigate Zone Three (remove all dead and down material) to the property line. Properties over three acres in size are required to mitigate to Zone Three standards to 210 feet. Vacant lots are required to mitigate to Zone Three standards to 210 feet from the center of the building

Recommendation	Priority
Reflective address markers on homes and street	High
Evacuation route north end of Red Draw	High
Evacuation route NE end of Emma's Way	High
Territories BLM Road evacuation – get easement from BLM	High
Gore Trail USFS Road – foot travel	High
Identify a nearby evacuation center	High
Create an evacuation plan for communities	High
Response drills	Moderate
Public Education	
*Salt Creek WUI (2005)	
Linked D-Space on East Timber Draw, West Timber Draw, and Timber Trail	
FB in Red Draw from Fenno Road to Timber Draw	
Shaded FB along Webb Peak Rd	
Old road cut as FB in Saddleridge	
Old road cut as FB in Redtail Ridge	
Fuels reduction along power line #1	
Fuels reduction along power line #2	
Shaded FB along Fenno Rd	
Remove oak w/in 100' of Territories Trail and building footprint of lot 16	
Shaded FB along The Summit Trail.	
Shaded FB along Redtail Ridge Rd	
Shaded FB along Granite Springs Tr	
Shaded FB to tie abandoned spur road off Granite Springs Trial into Gore Trail	
Shaded FB for Arabian Loop, Get-A-Long Trail, and Quarter Horse/Fox Trotter Loop (equestrian trails)	
Shaded FB along Peregrine Rd	
Shaded FB along Elk Woods Rd	
Shaded FB along Settler's Loop	
Shaded FB along Squaw Creek Rd	
Annual I & D inventory	
Draft hydrant at Gore Trail and Granite Springs Trail	
Draft hydrants in year-round ponds in the Summit and Territories	
Two large cisterns (10-30k gal) in Territories west of Winchester Trail	

Table 21 (Right). Recommendations from the original Cordillera CWPP that have not yet been completed.

envelope. Cordillera extended the distance for Zones Two and Zone Three in order to encourage extended defensible space, have more continuity, and minimize chunks of unmitigated property. Cordillera requires Zone One extend 20 feet from the drip edge to allow plants room to grow without encroaching on the 15 feet required by the county and state. The five-year schedule and number of affected properties is listed below.

2007 – 73 properties
2008 – 165
2009 – 238
2010 – 209
2011 – 156

The Design Guidelines have been changed to comply with Eagle County and CSFS standards for defensible space. Although landscape architects and the DRB continue to favor the use of conifers, the density and placement warrants wildfire protection. Aspen trees are encouraged.

Prior to Cordillera's efforts to mitigate wildfire hazards, the DRB required substantial planting of shrubs and trees near structures, often at the cost of tens of thousands of dollars. When conducting parcel level hazard assessments, Cordillera staff advised property owners of the hazards associated with this landscaping, but staff did not require shrub or tree removal. If or when a property conducts any remodel or construction activity that requires a permit, wildfire mitigation standards must be met.

Community Cleanup Days
CMD supports the property owner's efforts by conducting Community Cleanup Days. Cordillera is divided into three geographic areas: Divide; Ranch; and Summit. Each area receives one free pickup of yard debris each month in June, July. And August. Note: Current cost estimates put landfill fees, labor, and equipment at $70,000 each summer.

Wildfire Mitigation Maintenance
Cordillera requires, at a minimum, the maintenance of defensible space every five years. When the five-year cycle to create the initial defensible space ends in 2011, Cordillera will use the same schedule to inspect properties for maintenance on a five-year cycle.

Access/Egress
Cordillera has four geographic neighborhoods. On the east is The Divide accessed by Cordillera Way. On the west are Ranch, Summit, and Territories accessed by Fenno Drive.

In 2009, a road was built between Diamond Star Ranch and Summit of Cordillera. Diamond Star Ranch is a private community, located to the northwest of Cordillera, which has access from Highway 6. The new road is an improved graveled road that allows for emergency exit and access for Cordillera through the adjacent Diamond Star Ranch. In most conditions, this road will support a Type I fire apparatus.

In 2005, Cordillera negotiated a right-of-way agreement with the Bureau of Land Management (BLM) to use an old road and utility easement that runs from Territories to Brush Creek Road south of Eagle. The agreement allows Cordillera to use the road and perform basic maintenance to assure travel, such as cutting and removal of brush. Cordillera has cut brush and attempted basic grading, but the geology prevents reasonable grading, so use of this road is restricted to sport utility vehicles. This road would not support two-way traffic and, if a fire was near the road, the road would not be safe.

Between Emma's Way, which is located in the Ranch, and West Squaw Creek Road, which is a county road, lies a natural gas easement. Cordillera grades this road in the summer, which makes it passable for most vehicles to use as an emergency exit. Emma's Way is too steep for most fire equipment, excluding wildland apparatuses, to use to access Cordillera.

Dry Hydrant
In 2005, Cordillera installed a dry hydrant for fire suppression use at the Granite Springs Pond, which is located at the Summit in Cordillera. The Granite Springs pond is a manmade pond for golf-course irrigation. The pond is fed by water from the Eagle River. The dry hydrant shares a gravity-fed cistern from the pond. Pond capacity is approximately 10-acre feet or 3,260,000 gallons of water.

Water Supplies
In 2003, Schmueser, Gordon, Meyer, Engineers, Inc. (SGM) conducted a survey of the Cordillera water system. Since that time, Cordillera has been upgrading portions of the water system each summer in compliance with SGM's recommendations. In 2005, a 500,000-gallon storage tank, with improved piping for delivery, was added above El Mirador Road. This tank improved storage and solved hydraulic issues along El Mirador Road and

Granada Hill. CMD also has converted dead-end water pipes to loops in order to improve hydraulic performance and water quality.

Community Wildfire Projects
In 2004, the CPOA initiated a series of community wildfire projects, designed to protect neighborhoods or streets at the higher end of the fire hazards. The sewer easements below the homes were excellent starting points for fuel breaks as they were already cleared of vegetation and provided platforms for work crews and equipment. Attached is a list and description of completed community wildfire projects.

Mountain Pine Beetle
During wildfire mitigation work in 2005, crews detected an increase in MPB activity in Cordillera. During the winter of 2005-2006, Cordillera contracted for a survey of all lodgepole pine in Cordillera. Infested trees were assigned a GPS waypoint and the Eagle County GIS Department made maps. This survey showed significant beetle activity and cause for action in 2006.

In 2006 and 2007, Cordillera removed all accessible beetle-infested trees and sprayed all healthy, accessible lodgepole pine trees on open space and private property.

As MPB activity continued to increase, in 2007, focus shifted from wildfire mitigation projects to MPB mitigation, hoping to slow the spread of the pine beetle and to mitigate the fire danger associated with the dead trees.

In August 2007, there was another shift in philosophy concerning how to deal with the MPB. The approach of removing infested and dead lodgepole pine was resulting in unhealthy stands of lodgepole pine. As the density of the trees in the forests declined, there was an increase in the number of trees that were falling or breaking. Repeated entries by heavy equipment to remove the trees was compacting the soil and retarding natural re-vegetation. In August 2007, Cordillera began clear cutting stands of lodgepole pine on open space. In most cases, the entire tree was removed and processed at a separate staging area. This prevented the fire danger of slash and the smothering affect of chipping. Tree tops and limbs were ground-up and transported off site. At the end of 2010, Cordillera and its property owners had removed over 35,000 lodgepole pine trees.

Roadside Shaded Fuel Breaks
Throughout the report Anchor Point recommends roadside shaded fuel breaks. In many locations, this is not practical. First, much of the private property along the roads has been landscaped. Therefore, it has irrigated vegetation and is often not filled with dead and down material. In some situations, there is not sufficient space between the road and the property to have a shaded fuel break. Property owners with thick brush along the road are encouraged to thin the vegetation, and when Cordillera staff thin vegetation along roads, they must be sensitive to privacy issues when the structures are near the road.

Fire Department Coverage
In 2004-2005, when Anchor Point conducted its review of Cordillera, most of Cordillera was in the ERFPD with an area west of Golden Bear Drive being in the Greater Eagle Fire Protection District (GEFPD). ERFPD has two stations in Cordillera, and GEFPD's closest station was in the town of Eagle. In 2008, a boundary line change between the districts was negotiated, and Cordillera now is entirely within the boundaries of the ERFPD.

Communications – EC Alert
Eagle County has set up the Eagle County (EC) Alert system, which uses text messaging and emails to communicate emergencies and important events to participating parties. Eagle County has enabled Cordillera to set up a Cordillera page for EC Alerts. Cordillera encourages Cordillera property owners to participate in EC Alert.

The system was "tested" simultaneously with Reverse 911 in a 2009 wildfire field exercise. Where EC Alerts went through in minutes, the Reverse 911 took between 20 minutes to one hour to reach property owners. Some property owners reported they never received the Reverse 911. In some cases, updates to the initial EC Alert were received before the initial Reverse 911 was received.

Eagle County 2009 Wildfire Exercise
In 2009, Cordillera was a participant in an Eagle County multi-agency wildfire exercise designed to test resources and communications. The Cordillera portion of the exercise tested evacuation procedures. Cordillera staff performed door-to-door visits while Eagle County tested Reverse 911 and EC Alert.

SECTION II – COMMUNITIES

#1 Webb Peak (Page B-8) (Hazard Rating = Extreme)
Webb Peak property owners were required to address defensible space in 2007, the first year of the mandatory program. Four homes have been added to this neighborhood since the Anchor Point report, all in accordance with Eagle County wildfire regulations for construction and defensible space. Two vacant lots were initially exempt from the 2008 deadline as they had significant dead lodgepole pine that was adjacent to CMD open space, which also had significant dead lodgepole pine. The dead lodgepole trees were removed from this area, a total of 6.17 acres, in 2010. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

In 2004, a shaded fuel break was created in the open space along the east side of Webb Peak Road. Dead and down trees and ladder fuels were removed. Trees were thinned, and the limbs on the evergreens were cut to a height of approximately eight feet. In 2008, crews extended this fuel break and cleaned up debris left by the 2004 contractor. In 2008, the west side of Webb Peak Road received similar treatment. Also in 2008, a fire road/fuel break was constructed below Webb Peak along an existing horse trail. The trail was re-graded to allow access for wildland fire trucks. In certain areas, vegetation was removed. Turnarounds/safety zones were constructed at the middle and the end of the trail. Both 2008 projects were cost-share grants from Colorado State Forestry.

#2 Redtail Ridge (Page B-9) (Hazard Rating = Extreme)
Redtail Ridge property owners were required to address defensible space to three acres, or 210 feet, in 2008. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

In 2005, a shaded fuel break was created along the east side of Redtail Ridge, below the homes, utilizing the existing sewer easement. The oak brush and sage brush were thinned. Where there were large junipers, the lower limbs were cut, and the ladder fuels were removed.

In 2006, a shaded fuel break was constructed between Peregrine Drive and Redtail Ridge, utilizing the existing sewer easement. The fuel break involved several different fuel types, ranging from aspen with brush understory, tall serviceberry, gambrel oak, and mature Douglas-fir. Maintenance work was performed along the fuel break in 2008.

In 2009, a shaded fuel break was created on the open space on the west side of Redtail Ridge at the end of the road. This area was extremely thick gambrel oak and serviceberry.

#3 El Mirador (B-10) (Hazard Rating = Extreme)
El Mirador properties were required to address defensible space to three acres, or 210 feet, in 2008. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

In 2006, a fuel break was cut below and north of Alcazar and Granada Hill. In 2008 and 2010, maintenance work was conducted. The fuel break extends approximately 100 feet downhill to the irrigated lawns behind the homes and the existing sewer easement.

Anchor Point recommended thinning 100 feet from the road centerline. This is difficult when the adjacent property is privately owned and in one area is U.S. Forest Service property.

#4 Saddleridge (B-11) (Hazard Rating = Very High)
Saddleridge properties were required to address defensible space to three acres, or 210 feet, in 2006. All property owners in this neighborhood have addressed their wildfire mitigation issues.

A shaded fuel break was constructed below Saddleridge in 2006 utilizing the sewer easement that runs below the homes on the end of Saddleridge. Brush was thinned. Lower limbs were cut from large junipers, and ladder fuels were removed. The northwest slope below Saddleridge is dense old age Douglas-fir trees. The area was reviewed with Anchor Point in 2006. It was agreed by Anchor Point and Cordillera land managers that with such large trees, the amount of fuel needing removal to mitigate the hazard was either prohibitive or impossible.

#5 Timbers and Fairways (Page B-12) (Hazard Rating = Very High)
Timbers property owners were required to address defensible space to three acres, or 210 feet, in 2007. Fairway property

owners were required to address defensible space in 2009. All property owners in these neighborhoods have addressed their wildfire-mitigation issues.

A shaded fuel break was created below the Timbers in 2005, utilizing an existing sewer easement that began at Fenno Drive and went across to East Timber Draw Road.

Beginning in 2006, all dead and dying lodgepole pine trees have been removed on open space and on private property.

#6 Granite Springs (Page B-13) (Hazard Rating = Very High)
Property Owners on Granite Springs were required to address defensible space to three acres, or 210 feet, in 2009. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

In 2007 and 2008, the owners of Lots 10-15 on Granite Springs removed all lodgepole pine and the dead and dying trees of other species. These five lots range in size from 10-15 acres. Cordillera coordinated the projects by building the skid trails across the lots that allowed access and removal of material. The property owners of Lots 16-18 have also cleared the dead and dying lodgepole from their properties. Cordillera has cleared most of the lodgepole pine immediately (200 feet) behind lots 16-18.

The Anchor Point report references an abandoned road on the south side of Granite Springs Road that is now CMD open space. Work in this area has been budgeted for summer 2011.

#7 Grey Hawk (Page B-14) (Hazard Rating = Very High)
Grey Hawk property owners were required to address defensible space in 2009. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

The sub-association coordinated work for all properties. Most of the work involved clearing the steep hillside on the south side of the enclave. The Anchor Point report references an overhead power line on the opposite hillside that is also below Fenno Drive. This hillside was treated in 2006 when dead and down timber from MPB trees was removed. In 2009, any remaining trees along the power line that could fall and hit the power line were removed. In 2010, the remaining lodgepole were removed.

#8 Casteel Ridge (Page B-15) (Hazard Rating = Very High)
Casteel Ridge property owners were scheduled to address wildfire-mitigation concerns in 2009. All but one property have completed their work. The remaining property was in the middle of foreclosure and has since been purchased. The new owner has committed to completing the work in 2011. The open space along Cordillera Way below Casteel is one of several roadside fuel-break projects on a work list. No safety zones have been constructed although there are two large cul-de-sacs, one at the junction of Cordillera Way and Casteel and the other at the junction of Cordillera Way and Alhambra.

#9 Aspens/Black Bear/Whitaker Ponds (Page B-16) (Hazard Rating = Very High)
This neighborhood was required to address wildfire-mitigation concerns in 2009. All but one property, which is in foreclosure, have complied. In 2007, most of the lodgepole pine trees above Forest Trail were removed. This was a collaborative effort between the private property owners, the Cordillera Property Owner's Association and the Cordillera Metro District. Aspen trees along Black Bear have been dying at a rapid rate. Most property owners have removed all of their dead aspen trees. Cordillera removed 160 dead aspen along the road in 2010. In 2011, Cordillera is budgeted to treat a 25-acre section of open space that parallels the south side of Black Bear. This project would involve removal of approximately 5,000 lodgepole pine trees and 2,000 dead aspen trees. Patches of green aspen will be cut hoping to stimulate new growth of aspen trees.

#10 Red Draw and Peregrine (Page B-17) (Hazard Rating = Very High)
Properties along Peregrine were required to address wildfire issues in 2007. Properties along Red Draw were required to address wildfire issues in 2008. A shaded fuel break was created from the end of Peregrine to Redtail Ridge in 2006. In 2008, maintenance work was conducted along this fuel break.

#11 Kensington Green (Page B-18) (Hazard Rating = High)
Kensington Green was scheduled for wildfire mitigation work in 2009. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

The Cordillera portion of an overhead power line that feeds the divide from Highway 6 was cleared in 2005.

#12 Bearden Meadows (Page B-19) (Hazard Rating = High)
Properties in Bearden Meadows were required to address wildfire issues in 2009. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

In 2008, a three-acre section of lodgepole pine in poor health was clear cut below the end of Bearden Road. In 2010, a 3.5-acre section of lodgepole pine below Aspen Meadows was clear cut. In 2010, a 40-acre section of lodgepole pine between Elk Woods and Bearden was clear cut. For all of these projects, the whole trees were removed by yarder to avoid leaving slash as a fire hazard or chips that would smother new growth. With minimal impact from heavy equipment, we hope re-vegetation will be accelerated.

#13 Andorra/Central Divide (Page B-20) (Hazard Rating = High)
Properties in the Andorra neighborhood were scheduled for wildfire mitigation in 2008. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

#14 Red Draw Meadows (Page B-21) (Hazard Rating = High)
Properties in the Red Draw Meadows neighborhood were scheduled for wildfire mitigation in 2008. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

The Anchor Point report references establishing an alternative exit at the bottom of Red Draw Road. In 2009, Cordillera contacted the owner of the private property adjacent to Cordillera in order to establish this exit utilizing an existing utility easement. *The private property owner would not agree to such an arrangement.*

#15 Settler's Woods (Page B-22) (Hazard Rating = High)
Properties at Settler's Woods were scheduled for wildfire mitigation in 2010. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

The Anchor Point report references a two-track dirt road that can be used as an escape route. This road is a natural gas line easement. Cordillera grades this road in the summer to enhance its suitability as an exit. It is too steep to use as an alternative entrance for most fire apparatuses.

#16 Elk Woods and Elk Springs (Page B-23) (Hazard Rating = High)
The Elk Woods and Elk Springs neighborhoods were scheduled for wildfire mitigation in 2009. All but two property owners have complied.

This area has considerable lodgepole pine. Owners have been removing dead and infested trees and spraying healthy trees.

#17 Summit Club (Page B-24) (Hazard Rating = High)
The Summit Club area was scheduled for wildfire mitigation in 2010. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

#18 Granada Glen (Page B-25) (Hazard Rating = High)
The Granada Glen neighborhood was scheduled for wildfire mitigation in 2010. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

#19 Settler's Loop (Page B-26) (Hazard Rating = High)
Settler's Loop was scheduled for wildfire mitigation in 2010. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

This neighborhood has several new homes and all have noncombustible roofs.

#20 Territories (Page B-27) (Hazard Rating = High)
The Territories is scheduled for wildfire mitigation in 2011. The one property constructed prior to the Anchor Point report has addressed its wildfire-mitigation issue. The one property constructed after the Anchor Point report has addressed its wildfire mitigation per Eagle County requirements and has a noncombustible roof. Currently, there is one house under construction in the Territories.

Anchor Point states that no fire hydrants are in the Territories. The top half of the Territories does have fire hydrants supplied by the Eagle River Water System. Individual properties must use well water for domestic water and fire fighting reserves. Territories properties are required by Cordillera to have fire sprinkler systems and, therefore, they must also have water storage per Eagle County and NFPA standards.

A Use Agreement was established with the BLM in 2006. The Use Agreement permits Cordillera to use the old road between the Territories and Brush Creek for emergencies and to perform maintenance to keep the road passable. Cordillera has removed brush and done some grading as erosion control. This road would be most useful as an exit. Use as an entrance for fire apparatuses would be limited to wildland fire equipment.

#21 Gold Dust/Murphy's Creek (Page B-28) (Hazard Rating = Moderate)
Properties in these neighborhoods were scheduled for wildfire mitigation in 2010. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

#22 Cimarron (Page B-29) (Hazard Rating = Moderate)
Cimarron property owners will be required to address wildfire-mitigation issues in 2011.

#23 Bearcat (Page B-30) (Hazard Rating = Moderate)
Bearcat property owners will be required to address wildfire-mitigation issues in 2011.

In 2010, the Bearcat Association began the process of replacing cedar-shake roofs with noncombustible roofs.

#24 Summit Fairways (Page B-31) (Hazard Rating = Moderate)
Summit Fairways property owners were scheduled to address wildfire-mitigation issues in 2010. All property owners in this neighborhood have addressed their wildfire-mitigation issues.

#25 Founder's Preserve (Page B-32) (Hazard Rating = Moderate)
Property Owners in Founders Preserve are scheduled to address wildfire-mitigation issues in 2011.

#26 Club Cottages (Page B-33) (Hazard Rating = Low)
Property owners in the Club Cottages are scheduled to address wildfire-mitigation issues in 2011.

#27 Bentgrass (Page B-34) (Hazard Rating = Low)
Property owners in the Bentgrass neighborhood are scheduled for wildfire-mitigation issues in 2011.

#28 Martingale (Page B-35) (Hazard Rating = Low)
Properties in the Martingale neighborhood were scheduled for wildfire mitigation in 2010, and all but one property has complied. The remaining property is in foreclosure and only has a few dead aspen trees.

Conclusion & Next Steps

The ERFPD CWPP is a comprehensive analysis of wildfire related hazards and risks in the WUI areas in central Eagle County, Colorado. The results of the analysis were used to determine a variety of fuel-reduction projects throughout the study area. Although these are recommendations made by Anchor Point Group LLC, the stakeholders can also use these results to guide decision making for additional fuel-reduction projects. Recommendations focus on reducing the threat of wildfire to values within the study area. Additional recommendations are presented throughout the main document, as well as in Appendix A.

The concerns and comments of public land management agencies, private landowners, and residents were used to generate this document. The ERFPD CWPP is a multiyear, guiding document that will facilitate the implementation of future mitigation efforts. The CWPP is a living document, meaning it changes and evolves through time. Consequently, it should be revisited at least annually to assess the relevance and progress on the given recommendations. There is no official way to amend a CWPP, but any changes must be collaborative and include stakeholder representation.

ESTABLISH A FIRE WISE COUNCIL

The most important next step is to establish a fire safe council or fire mitigation group. This effort is imperative to ensure that the CWPP is continuously revisited, modified as necessary, updated, and utilized to its fullest capacity. Following the adoption of the CWPP, the stakeholder group identified in the CWPP development should reconvene annually with the purpose of assembling a group of community members who would become responsible for implementing the projects in the document. Ideally, a representative for every community/ planning area should be on the council, in addition to members from local agencies, the fire protection district, local utility companies, area ranches, and any other interested parties.

Once the council has been formed, it should focus on one goal in the first year. This may include creating and distributing a newsletter, setting up an additional public meeting(s) to gain community support, picking a single fuel mitigation project to complete as an example, or producing an annual work plan.

The initial, first-year goal established by the council must be achievable to generate momentum. Successfully completing this task will serve to motivate the fire safe council and residents alike.

Each subsequent year the group should reconvene again with the goal of identifying priorities and developing an annual work plan. The meeting should be held at a neutral site and at the same time each year to ensure continuity and increased attendance. Suggested months include February or March, which are after the holidays and before the upcoming field season. As projects are completed, the parties should update each other with a brief write up, and map if necessary, of the project using a ‘Reply All’ email or other suitable method.

PROJECTS TO IMPLEMENT

The table below is a list of the projects identified by Anchor Point Group. This summary table does not include individual defensible space recommendations, though it should be reiterated that defensible space is the most important action an individual homeowner and community can take. Further details for each of the projects can be found within the Community Analysis and Recommendations section of the main report. A map of each of the projects is included. The recommendations are not a prescription for the area, and any project should be done in conjunction with a trained forester. The projects detailed in the CWPP are not the only projects that are viable within the planning areas. Landscape-scale projects are excellent options as well, but often require multiple communities working with federal and state agencies, county governments, utility companies, and adjacent private landowners. As support and community involvement grows through these smaller projects, larger treatments become more viable. Additional projects at all scales should be considered by a fire safe council, especially as ERFPD and communities begin to complete the initial projects identified.

To facilitate implementation, each action item, such as fuel modification, public education, etc., can be populated into the Action Item Worksheet, below, to organize information on key issues, develop ideas for implementation, coordinate with partner organizations, generate a timeline, and plan goals.

Community	Community Hazard Rating	Fuel Break / Secondary Egress	Acres
Bellyache	High	Ridge Road Fuels Treatment	23
Colorow	High	Secondary Egress	N/A
		Southern Fuel Break	35
Cordillera Valley Club	High	Linked Defensible Space	3
Eagle River Village	Low	Roadside Fuel Break	18
Eagle-Vail	Moderate	Linked Defensible Space	5
Homestead	Moderate	East and West Linked Defensible Spaces	8.5
		Secondary Egress	N/A
Minturn	High	Fuel Breaks 1, 2 and 3	47
		Completion of Proposed FS Treatments	TBD
Mountain Star	High	Fuel Breaks 1 and 2	49
		Northern Fuel Break	55
Pilgrim Downs	High	Secondary Egress (to Colorow)	N/A
		Secondary Egress (to Lake Creek)	N/A
Singletree	High	Chaparral Linked Defensible Space	4
		Latigo Fuel Break	4
Tennessee Pass	High	Proposed Roadside Thinning / Fuel break	36
Ute Forest	Very High	Drainage Fuel Break 1 and 2	9
		Secondary Egress Creation / Thinning	25
West Lake Creek	High	Ridge Road Roadside Thinning	40
		Secondary Escape Route Improvement	N/A
Whiskey Hill	Very High	Southern Fuel Break	36
Wildridge / Wildwood	High	Linked Defensible Space	25

Conclusion & Next Steps

ACTION ITEM WORKSHEET

Proposed Action Item Identification		
(Each action item includes a list of the key issues that the activity will address. Action items should be fact based and tied directly to issues or needs identified through the planning process.)		
Proposed Action Title		
(*Utilize the appropriate recommendation name or title in the CWPP.*)		
Rationale for Proposed Action Item		
(*Utilize any justification or report language in the CWPP.*)		
Ideas for Implementation (Optional)		
(Each action item includes ideas for implementation and potential resources. This information enables a transition from theory to practice. The ideas for implementation serve as a starting point for this plan. This component is dynamic in nature, as some ideas may not be feasible and new ideas may be added during the plan maintenance process. Report graphics can add value to this section.)		
Coordinating Organization		
Internal Partners		**External Partners**
(*Internal partners are members of the CWPP advisory committee and may be able to assist in the implementation of action items by providing Relevant resources to the coordinating organization.)*		(*External partner organizations can assist the coordinating organization in implementing the action items in various ways. Partners may include local, regional, state, or federal agencies, as well as local and regional public and private sector entities.)*
Timeline		**Estimated Cost**
Short Term (0-2 years)	Long Term (More than 2 years)	(*If available, list cost estimate.)*
(Action items or activities that may be implemented with existing Resources and authorities within one to two years.)	*(Action items or activities that may require new or additional resources and/ or authorities, and may take from one to five* years to implement.)	

To facilitate implementation, each action item, such as fuel modification, public education, etc., can be populated into the provided worksheet on the next page, to organize information on key issues, develop ideas for implementation, coordinate with partner organizations, generate a timeline, and plan goals addressed.

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Glossary

The following definitions apply to terms used in the Eagle River Community Wildfire Protection Plan and/or are widely used wildland firefighting terms.

1-hour time lag fuels: Grasses, litter, and duff; <1/4 inch in diameter

10-hour time lag fuels: Twigs and small stems; 1/4 inch to 1 inch in diameter

100-hour time lag fuels: Branches; 1 to 3 inches in diameter

1000-hour time lag fuels: Large stems and branches; >3 inches in diameter

active crown fire: This is a crown fire in which the entire fuel complex – all fuel strata – become involved, but the crowning phase remains dependent on heat released from the surface fuel strata for continued spread (also called a running crown fire or continuous crown fire).

crown fire (crowning): The movement of fire through the crowns of trees or shrubs; may or may not be independent of the surface fire.

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

fine fuels: Fuels that are less than 1/4 inch in diameter, such as grass, leaves, draped pine needles, fern, tree moss, and some kinds of slash, which, when dry, ignite readily and are consumed rapidly.

fire behavior potential: The expected severity of a wildland fire expressed as the rate of spread, the level of crown fire activity, and flame length. This is derived from fire behavior modeling programs using the following inputs: fuels; canopy cover; historical weather averages; elevation; slope; and aspect.

fire danger: In this document, we do not use this as a technical term, due to various and nebulous meanings that have been historically applied.

fire hazard: Given an ignition, the likelihood and severity of fire outcomes (fire effects) that result in damage to people, property, and/or the environment. The hazard rating is derived from the community assessment and the fire behavior potential.

fire mitigation: Any action designed to decrease the likelihood of an ignition, reduce fire behavior potential, or to protect property from the impact of undesirable fire outcomes.

fire risk: The probability that an ignition will occur in an area with potential for damaging effects to people, property, and/or the environment. Risk is based primarily on historical ignitions data.

flame length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

fuel break: A natural or constructed discontinuity in a fuel profile that is used to isolate, stop, or reduce the spread of fire. Fuel breaks may also make retardant lines more effective and serve as control lines for fire suppression actions. Fuel breaks in the WUI are designed to limit the spread and intensity of crown fire activity.

ISO (Insurance Standards Office): A leading source of risk (as defined by the insurance industry) information to insurance companies. ISO provides fire risk information in the form of ratings used by insurance companies to price fire insurance products to property owners.

passive crown fire: A crown fire in which individual or small groups of trees torch out (candle), but solid flaming in the canopy fuels cannot be maintained except for short periods.

shaded fuel break: An easily accessible strip of land of varying width (depending on fuel and terrain), in which fuel density is reduced, thus improving fire control opportunities. The stand is thinned, and remaining trees are pruned to remove ladder fuels. Brush, heavy ground fuels, snags, and dead trees are disposed of, and an open, park-like appearance is established.

slash: Debris left after logging, pruning, thinning, or brush cutting. This includes logs, chips, bark, branches, stumps, and broken understory trees or brush.

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.

structural triage: The process of identifying, sorting, and committing resources to a specific structure.

surface fire: A fire that burns the surface litter, debris, and small vegetation on the ground.

values at risk: People, property, ecological elements, and other human and intrinsic values within the project area. Values at risk are identified by inhabitants as important to the way of life in the study area, and are particularly susceptible to damage from undesirable fire outcomes.

WHR (Wildfire Hazard Rating; community assessment): A 140-point scale analysis designed to identify factors that increase the potential for and/or severity of undesirable fire outcomes in WUI communities.

WUI (Wildland Urban Interface): The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. This is sometimes referred to as Urban Wildland Interface, or UWI.

Recommended Reading

At Home in the Woods – Lessons Learned in the Wildland/ Urban Interface, FEMA, 2004.

Bachmann, A., and Allgower, B., *A Consistent Wildland Fire Risk Terminology is Needed!,* Fire Management Today (61, 4), USDA Forest Services, Washington, DC, Fall 2001.

Dennis, F.C., *Fuel break Guidelines for Forested Subdivisions,* Colorado State Forest Service, Colorado State University, 1983.

Developing a Cooperative Approach to Wildfire Protection, National Wildland-Urban Interface Fire Protection Program.

Firefighter Safety in the Wildland/Urban Interface – A Video Series (VHS Video - 60 Minutes.), National Wildland/Urban Interface Fire Program, 2003.

Fires that Changed the Fire Service – Wildlands (VHS Video – 84 Minutes.), American Heat, March 2000.

Home Improvement: A Firewise Approach (VHS Video – 15 Minutes.), 2003.

Introducing Firewise Communities Workshops (VHS Video– 6 Minutes.), Firewise Communities, Quincy, MA.

Preparing a Community Wildfire Protection Plan – a Handbook for Wildland-Urban Interface Communities, Sponsored by: Communities Committee, National Association of Counties, National Association of State Foresters, Society of American Foresters, Western Governors' Association, March 2004.

Slaughter, R. (ed.), California's I-ZONE – Urban/Wildland Fire Prevention & Mitigation, Sacramento, California, Jan. 1996.

Standard for Protection of Life and Property from Wildfire, NFPA 1144(02) (Formerly *NFPA 299*) National Fire Protection Association, Quincy, MA, 2002.

Urban-Wildland Interface Code™, International Fire Code Institute, Whittier, California, Jan. 2000.

White, C., Dry Hydrant Manual – A Guide for Developing Alternative Water Sources for Rural Fire Protection, Developed for Summit County, Colorado.

Wildland/Urban Interface Fire Hazard Assessment Methodology, Developed by National Wildland/Urban Interface Fire Protection Program. Wildland/Urban Interface Fire Policy Action Report, Western Governors' Association, Feb. 1996.

Useful Links

Eagle River Fire Protection District
http://www.eagleriverfire.org

Environmental Protection Agency Watershed Protection
http://cfpub.epa.gov/fedfund

ESRI Grant Assistance Program for GIS Users
http://www.esri.com/grants

The Fire Safe Council
http://www.FireSafeCouncil.org

FRAMES (Fire Research and Management Exchange System)
http://www.frames.gov/tools

Government Grants
www.grants.gov

National Association of State Foresters Listing of Grant Sources and Appropriations
http://www.stateforesters.org/

National Database of State and Local Wildfire Hazard Mitigation Programs
http://www.wildfireprograms.com

Standard for Protection of Life and Property from Wildfire, NFPA 1144
http://www.normas.com/NFPA/PAGES/NFPA-1144.html

Standard for Protection of Life and Property from Wildfire, NFPA 299
http://webstore.ansi.org/RecordDetail.aspx?sku=NFPA+299-1997

Grants

Often the biggest hurdle to overcome when trying to implement a CWPP or wildfire mitigation projects is funding. By having an official CWPP, a multitude of funding sources become available to complete the work outlined in the plan. Federal, national, state, and county funds are available to begin treatments. The list below is not all inclusive, but it provides the most commonly available sources for funding and outreach.

Colorado State Forest Service (CSFS)

- Purpose: to help homeowners and landowners promote healthy and sustainable forest conditions. CSFS does this is by emphasizing action on state, private, and other nonfederal lands, and providing technical and financial assistance to those who have demonstrated a willingness and/or commitment to effectively manage their property.
- Tax exemption for wildfire mitigation work: Colorado landowners with property located in a Wildland Urban Interface area also may qualify to receive a tax exemption for the costs of wildfire mitigation work. As authorized by §39-22-104(4)(n), C.R.S., for income tax years 2009 through 2013, individuals, estates and trusts may subtract from federal taxable income 50 percent of the costs incurred in performing wildfire mitigation measures.
  http://csfs.colostate.edu/pages/programs-home-land-owners.html
  http://csfs.colostate.edu/pages/funding.html

Federal Emergency Management Agency (FEMA)

- **Assistance to Firefighters Grant Program**
  - Purpose: to improve firefighting operations; purchase firefighting vehicles, equipment, and personal protective equipment; fund fire prevention programs; and establish wellness and fitness programs.
  - Necessary information includes a DUNS number, Tax ID number and Central Contractor Registration.
  - Grants are usually required to be submitted by the end of September.
    http://www.fema.gov/firegrants/afggrants/index.shtm

- **SAFER: Staffing for Adequate Fire and Emergency Response**
  - Purpose: to provide funding directly to fire departments and volunteer firefighter interest organizations in order to help them increase 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 and OSHA.
    http://www.fema.gov/firegrants/safer/index.shtm

- **Fire Prevention and Safety Grants (FP&S)**
  - Purpose: The Fire Prevention and Safety Grants (FP&S) are part of the Assistance to Firefighters Grants (AFG), and are under the purview of the Grant Programs Directorate in the Federal Emergency Management Agency. FP&S
    Grants support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to target high-risk populations and reduce injury and prevent death. In 2005, Congress reauthorized funding for FP&S and expanded the eligible uses of funds to include Firefighter Safety Research and Development.
    http://www.fema.gov/firegrants/fpsgrants/index.shtm

- **Hazard Mitigation Assistance Grant Program (HMGP)**
  - Purpose: to provide grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.
    http://www.fema.gov/government/grant/hmgp/index.shtm

- **Pre-Disaster Mitigation Grant Program (PDM)**
  - Purpose: to provide funds to states, territories, Indian tribal governments, communities, and universities for hazard-mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures.
    http://www.fema.gov/government/grant/pdm/index.shtm

Firewise Communities

- Purpose: a multi-agency organization designed to increase education of homeowners, community leaders, developers, and others on the Wildland Urban Interface and the actions they can take to reduce fire risk to protect lives, property, and ecosystems.
  http://www.firewise.org/

National Volunteer Fire Council

- Purpose: to support volunteer fire protection districts. Includes both federal and non-federal funding options and grant writing help.
  http://www.nvfc.org/resources/grants/

Natural Resources Conservation Service Emergency Watershed Protection Program

- Purpose: to undertake emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood, or any other natural occurrence is causing or has caused a sudden impairment of the watershed.
  http://www.nrcs.usda.gov/programs/ewp

Rocky Mountain Wildland Fire Information

- Purpose: to provide a searchable database of grant opportunities, a calendar of upcoming area trainings, public information resources, and links to other important wildfire websites.
  http://www.rockymountainwildlandfire.info/grants.htm

US Forest Service Cooperative Forestry Assistance

- Purpose: to assist in the advancement of forest resources management, the control of insects and diseases affecting trees and forests, the improvement and maintenance of fish and wildlife habitat, and the planning and conduct of urban and community forestry programs.

http://www.fs.fed.us/spf/coop

General Recommendations

GENERAL RECOMMENDATIONS

The following categories have been identified as areas to focus on within the Eagle River FPD study area to mitigate impacts from wildfire: home construction, landscaping/fuels, preparedness planning, infrastructure, public education and water source supply. Recommendations are provided for each category in the tables that follow. Priorities are based on actions that are most likely to protect life safety, property and other values at risk. **To improve life safety and preserve property, every home in the study area should have compliant, effective defensible space. Defensible space and proper home construction are THE MOST IMPORTANT actions an individual can do to protect their home.**

All of the recommendations found in the plan are summarized in the following tables. Implementation of the actions will be a shared responsibility in many cases and include individual homeowners, county staff, the fire protection district (FPD), federal agencies, the Colorado State Forest Service and other stakeholders. Suggestions for an implementation lead are identified for each action. These suggestions are not all-inclusive, and may require additional support from state and federal agencies. A summary table of all the specific fuels reduction recommendations within the county can be found in the Conclusions and Next Steps section in the main document.

Additional details on recommendations and issues specific to the recommended action items are discussed in text that follows the summary tables.

HOME CONSTRUCTION

Action Items	Implementation Lead
Post reflective house numbers so that they are clearly visible from the main road. Reflective numbers should also be visible on the structure itself.	Individual homeowners
Discourage the use of combustible materials for decks, siding and roofs, especially where homes are upslope from heavy vegetation.	Individual homeowners, County
Maintain and clean spark arresters on chimneys.	Individual homeowners
Enclose under decks so firebrands do not fly under and collect.	Individual homeowners
Use glass skylights; plastic will melt and allow embers into the home.	Individual homeowners
Enclose eaves and soffits.	Individual homeowners
Cover openings with 1/8” metal screen to block fire brands and embers from collecting under the home or deck.	Individual homeowners
The roof is the most important element of the home. Use rated roofing material. Replace any shake-shingle roofs with non-combustible types.	Individual homeowners, HOAs, County
Use fire-resistant building materials on exterior walls.	Individual homeowners

Table A1. Home Construction Recommendations

LANDSCAPING/FUELS

Action Items	Implementation Lead
Maintain your defensible space constantly	Individual homeowners
Clean your roof and gutters at least twice a year especially as vegetation begins to cure in the autumn.	Individual homeowners
Stack firewood uphill or on a side contour, at least 30 feet away from structures, outbuildings, and other infrastructure, such as propane tanks and power poles.	Individual homeowners
Do not store combustibles or firewood under decks or downhill.	Individual homeowners
When possible, maintain an irrigated greenbelt around the home. Be sure to mow grass regularly, especially along roads and fence lines.	Individual homeowners
Trees and vegetation along driveways should be thinned as necessary to maintain a minimum 15' vertical and horizontal clearance for emergency vehicle access along driveways. This includes removing ladder fuels, which are low lying branches that allow a fire to climb from the ground into tree canopies.	Individual homeowners
Focus on removing vegetation in drainages that intersect roads or are under bridges.	Individual homeowners, HOAs, County
Create a cinder block wall around the perimeter of your yard and use grass and slate to break up the landscape.	Individual homeowners
Use pavers, rock or xeriscaping to break up fuel continuity immediately adjacent to the home.	Individual homeowners
Use groupings of potted plants that include succulents and other drought resistant vegetation.	Individual homeowners
Use faux brick and stone finishes and high-moisture content annuals and perennials.	Individual homeowners
Use grass and driveways as fuel breaks from the house.	Individual homeowners

Table A2. Landscaping/Fuels Recommendations

General Recommendations

PREPAREDNESS PLANNING

Action Items	Implementation Lead
Connect, and have available, a minimum of 50 feet of garden hose to extinguish small fires before they spread.	Individual homeowners
Have nearby evacuation centers for citizens and staging areas for fire resources. This is especially important in communities with single access and a high population density.	County, FPD
Where available, large safety zones should be maintained and identified in all evacuation planning. These safety zones will need to be of adequate size and quality in order to be effective.	Communities, HOAs, County, FPD
Identify and pre-plan primary escape routes for all CWPP communities. Emergency management personnel should be included in the development of preplans for citizen evacuation. Reevaluate and update these plans as necessary.	County, FPD
Educate citizens on the proper escape routes and evacuation centers to use in the event of an evacuation. This also applies to animal rescue.	County, FPD
Create an evacuation plan that is presented and distributed to residents.	County, FPD
Ensure the existing reverse 911 system includes wildfire notifications.	County
Perform response drills to determine the timing and effectiveness of escape routes and fire resource staging areas.	County, state, FPD
Conduct a parcel-level wildfire hazard analysis for all the homes in the study area, especially those with an extreme or very high rating.	County, FPD
Identify areas where large animal evacuation is an issue and develop a plan for evacuation.	County, FPD
Maintain or develop pre-attack/operational plans for the study area. The pre-attack plan assists fire agencies in developing strategies and tactics that will mitigate damage when incidents do occur.	County, FPD
Develop fire safety brochures that can be distributed and made available to guests in the summer months.	Communities, HOAs, County, FPD

Table A3. Preparedness Planning Recommendations

INFRASTRUCTURE

Action Item	Implementation Lead
A program of replacing worn or difficult to read street signs should be developed. Include specifications and input from County officials, developers, HOAs, and the fire protection districts.	County
A “No Outlet” sign should identify all dead end streets and roads.	County, communities, HOAs
Provide adequate turnarounds for emergency equipment throughout all communities.	County, developers
Encourage the placement of all utilities, including propane tanks and power lines, below ground.	County, communities, HOAs
Determine and post load limits for all bridges and applicable culverts within the study area.	County, private communities
All utility companies should provide information about the locations of powerlines, substations, natural gas lines, and any other relevant infrastructure to the FPD.	County, FPD, utility companies

Table A4. Infrastructure Recommendations

General Recommendations

PUBLIC EDUCATION

Action Item	Implementation Lead
Remain aware of the current fire danger in your area.	All
Implement fire prevention, fire preparedness, and defensible space and hazard reduction recommendations for each community.	County, state, communities, HOAs
Obtain additional “Smokey Bear” signs for use along entrances into towns and popular recreation areas to inform the public of the current fire danger and to promote fire prevention. Ensure that fire danger messages are kept up to date with Daily Fire Danger broadcast to maintain credibility and effectiveness.	County, state, FPD, communities, HOAs
Hold multiple meetings per year to educate residents on wildfire risk, defensible space, and evacuation.	County, CSFS, FPD
Provide citizens with the findings of this study including: • Levels of risk and hazard • Values of fuels reduction programs • Consequences of inaction for the entire community	County, CSFS, FPD
Create a Firewise Council or similar WUI citizen advisory committee to promote the message of shared responsibility. The Firewise Council should consist of local citizens, and its primary goals should be: • Bringing the concerns of the residents into the prioritization of mitigation actions • Selecting demonstration sites • Assisting with grant applications and awards	Communities, HOAs, FPD
Make use of regional and local media to promote wildfire public education messages in the fire district.	County, state, FPD
Maintain a current wildfire educational presentation explaining the concepts of defensible space and wildfire hazard mitigation. The information in this report should be incorporated into that presentation for the education of homeowners countywide. This could be done through informational gatherings sponsored by the fire department, homeowners associations or neighborhood groups such as local festivals, school events, at times of extreme fire danger, and other times of heightened awareness concerning wildfire. It is far easier to bring the information to citizens than to bring citizens to the information, making this an especially powerful resource.	County, CSFS, FPD

Table A5. Public Education Recommendations

WATER SUPPLY

Action Item	Implementation Lead
Areas with no water or inadequate water supply should be evaluated to improve existing hydrants, establish a stored water supply, or use firefighting resources.	County, FPD
Install dry hydrants on applicable streams and ponds in areas that currently lack hydrants.	Communities, FPD
Continue to map the location of water sources and their volumes. Make this information available for use by emergency personnel in and out of the district.	County, FPD
Make sure cisterns are well marked with their capacity and are kept clear of vegetation.	County, FPD
Conduct annual testing for fire hydrant function and capacity.	County, FPD
FPD trainings should focus on drafting operations frequently throughout the spring and summer to ensure apparatus can fill in the event of a wildfire.	FPD
Invite Eagle River Water & Sanitation District representatives to continue to participate in wildfire exercises. Those representatives will then be better prepared to assist firefighters in finding reliable sources of potable water during an actual emergency. ERWSD operators would monitor tank levels throughout the water district, and begin pumping water to where it is most needed.	FPD

Table A6. Water Supply Recommendations

General Recommendations

HOME CONSTRUCTION

General Home Construction Considerations:

- Enclose under decks so firebrands do not fly underneath and collect.
- Use glass skylights; plastic will melt and allow embers into the home.
- Enclose eaves, fascias, soffits and vents. 'Box' eaves, fascias, soffits and vents, or enclose them with metal screens.
- Use non-flammable fencing if attached to the house, such as metal.
- Cover openings with 1/8" metal screen to block fire brands and embers from collecting under the home or deck.
- The roof is one of the most important elements of the home. Use rated roofing material.

Building Materials:

Use rated roofing material. Roofing material with a Class A, B or C rating is fire resistant and will help keep the flame from spreading. Examples include:

- Composition shingle
- Metal
- Clay
- Cement tile

Use fire-resistant building materials on exterior walls. Examples include:

- Cement, plaster, stucco or masonry (concrete, stone, brick or block) are all great fire-resistant building materials.
- While vinyl is difficult to ignite, it can fall away or melt when exposed to extreme heat.
- Use double-paned or tempered glass. Double-pane glass can help reduce the risk of fracture or collapse during an extreme wildfire. Tempered glass is the most effective.
- Protect overhangs and other attachments.
- Remove all vegetation and other fuels from around overhangs and other attachments (room additions, bay windows, decks, porches, carports and fences).
- Box in the undersides of overhangs, decks and balconies with noncombustible or fire-resistant materials.
- Fences constructed of flammable materials should not be attached directly to the house.
- Anything attached to the house (decks, porches, fences and outbuildings) should be considered part of the house. These act as fuel bridges, particularly if constructed from flammable materials.
- If a wood fence is attached to the house, separate the fence from the house with a masonry or metal barrier.
- Decks and elevated porches should be kept free of combustible materials and debris.
- Elevated wooden decks should not be located at the top of a hill. Consider a terrace.

Eagle County Wildfire Regulations

Planning and Zoning: Eagle County adopted Wildfire Regulations on January 21, 2003. These regulations are present in the Eagle County Land Use Regulations and Building Resolution. Due to the length of the Eagle County Land Use Regulations (LUR), only those portions relevant to community wildfire protection planning have been included in this draft.

- **SECTION 4-430. DEVELOPMENT IN AREAS SUBJECT TO WILDFIRE HAZARDS**

  Purpose There are certain regions of Eagle County that have the potential to pose hazards to human life and safety and to property because they can be threatened by wildfire. These regulations are intended to provide standards to reduce or minimize the potential impacts of wildfire hazards on properties, the occupants of properties and the occupants of adjacent properties, as well as to facilitate access to manmade structures by

firefighters in the event of a wildfire. Development should attempt to avoid high and extreme wildfire hazard areas whenever possible.

Standards:

a. Water Supply.

(1) Fire Hydrants. Fire hydrants shall be provided when a water distribution system will serve the proposed development and
shall meet the required fire flow as defined in the fire code in
effect at the time of application or as otherwise determined by the Local Fire Authority Having Jurisdiction.

(2) Water tanks, cisterns and/or dry hydrants. Water tanks, cisterns and/or dry hydrants shall be provided in developments that are not served by hydrants unless the Local Fire Authority Having Jurisdiction has approved an alternative fire protection water supply system.

b. Access. Separate routes of entrance and exit into the development shall be provided. Roads shall be laid out with consideration for creating fuel breaks and to ensure the adequacy of access by emergency vehicles, including the provision of regularly spaced turnouts along roadways, the establishment of adequate grades and sight distances and the prohibition of dead end streets (but not cul de sacs) in the development.

o **SECTION 4-620. ROADWAY STANDARDS**

j. Geometric Standards. All roads within unincorporated Eagle County, whether publicly or privately maintained, shall conform to the design standards and requirements shown in Table 4-620.J., Summary Of Environmental, Geometric And Design Standards.

l. Horizontal Alignment. The following special considerations for horizontal alignment shall apply to the design and construction or reconstruction of roadways in Eagle County:

h. Dual Access. The applicant shall provide two (2) points of access from the proposed development to the public roadway system, unless prevented by topography or other physical conditions. In any event there shall be a usable and unobstructed (with the exception of breakaway barriers) secondary emergency point of ingress/egress for all new development or redevelopment capable of accommodating emergency response vehicles commonly operated by the Local Fire Authority Having Jurisdiction. All dwellings and other structures shall be accessible by emergency and service vehicles. Depending upon the length of the road, fire hazard rating, number of units proposed, topography and the recommendation of the Local Fire Authority Having Jurisdiction, the Board of County Commissioners may, at their discretion, grant a variance from the required improvement standard.

(4-620.J.9.c.(1)

c. Additional County Standards. In addition to the foregoing, public and private access approaches and driveways shall be subject to the following standards:

(1) Access By Emergency and Service Vehicle. All dwellings and other structures shall be accessible by emergency and service vehicles. A maximum grade of eight (8) percent and a minimum centerline radius of forty-five (45) feet is recommended for driveways on north-facing

slopes. On south-facing slopes, a maximum grade of ten (10) percent and a minimum centerline radius of forty-five (45) feet is recommended. Curves should be widened generously in both circumstances.

Public and private access approaches and driveways in excess of 150 feet in length shall be provided with adequate area for emergency vehicle turnaround.

- **SECTION 4-680. WATER SUPPLY STANDARDS**

B. **Fire Fighting Facilities.** The developer shall provide fire hydrants, water tanks, cisterns and/or dry hydrants within the development capable of providing a fire fighting water supply. Such hydrants, water tanks, cisterns and/or dry hydrants shall be of the type, size and number, and shall be installed in locations as specified in Section 4.430.E.1.a, Water Supply of these Land Use Regulations, or as may be alternatively approved by the Local Fire Authority Having Jurisdiction.

Additional Sections of note in the Wildfire Regulations are: 5-240.F.2.a and 5-240.F.3.a which establish procedures for planned unit development districts with respect to wildfire mitigation. Section 5-280.B.4.a.(2).(v).dd. outlines application contents for subdivisions with regards to wildfire mitigation.

Reduction of Structural Ignitability and Defensible Space

Fire Resistant Construction: Chapter III of the Eagle County Building Resolution establishes minimum design and construction standards for the protection of life and property from fire within the Wildland/Urban Interface. These provisions are meant to aid in the prevention and suppression of fires, lessen the hazards to structures from wildland fires and lessen the hazards to wildlands from structure fires. These regulations are present in the Eagle County Land Use Regulations and Building Resolution. Due to the length of the Eagle County Land Use Regulations (LUR), only those portions relevant to community wildfire protection planning have been included in this draft.

Chapter III - Eagle County Building Resolution

3.13.1 – GENERAL

3.13.1.2.a All new building construction, exterior modification to existing buildings, and/or additions that increase an existing building's footprint or number of stories in moderate, high and extreme hazard zones shall cause the entire building to comply with the provisions of this regulation with regard to the creation of **Defensible Space**.

3.13.1.2.b All Communities and/or Subdivisions in existence prior to the effective date of these wildfire regulations may opt to prepare a **Comprehensive Wildfire Mitigation Plan**, which includes all lands and buildings within a definitive boundary delineated by said Plan.

3.13.2 - DEFINITIONS For the purpose of this regulation, certain terms are defined as follows:

COMPREHENSIVE WILDFIRE MITIGATION PLAN means an exhaustive, substantive compilation of commonly accepted practices designed to substantially decrease the hazards to life, property and the natural environment caused by wildfire.

DEFENSIBLE SPACE is a designated area surrounding a building or buildings that will be subject to fuel modification measures intended to reduce fire-spread potential between the structure and adjacent vegetation.

FIRE-RESISTIVE CONSTRUCTION means a fire-resistive shell- exterior walls shall be a listed, one-hour fire-resistive assembly or log (6" min. dia.), and the roof shall be protected by a layer of 5/8" type X gypsum board interior ceiling or nominal 2"x T&G wood interior ceiling. A non-combustible exterior wall surface (cement stucco, brick, stone, cement fiber siding) may be used in lieu of the exterior membrane of a listed wall assembly. Decks shall be one-hour fire resistive construction as defined in the building code in effect at the time of building permit application.

Road Signs

The majority of community roads within the study area do not have street signs that are both reflective and made from noncombustible materials. In many communities, street signs are either not present in all areas, made from combustible materials such as wood, and/or are nonreflective, meaning they are difficult to read under smoky or nighttime conditions. Moreover, in a number of communities, street signs are not even at eye level as would be seen from vehicle, meaning that a driver could easily drive past a street without seeing any sign.

Proper reflective signage is a critical operational need. Knowing at a glance the difference between a road and a driveway (and which houses are on the driveway) reduces errors and saves time spent interpreting maps. This is especially true for out-of-district responders who do not have the opportunity to train on access issues specific to the response area. The value of saved time, especially at night and in difficult conditions, can not be overstated: it can make the difference between lives saved and lost. Examples of street signs found in the study area are located below.

Home addressing

Addressing is another major issue in the study area. Most homes within communities lack reflective addressing that is easily visible from the road. Further, home addressing is often made of combustible materials and is not uniform within communities, let alone the county. Visible addressing is vital for fire and medical responders to determine the location and number of structures within a community. Often, addressing is not easily visible during the darkness of night or during smoky conditions. A good standard to follow for addressing is to use metal white markers that are four inches in width on a green background. These should be placed three to five feet above ground. Examples of addressing found in the study area are shown below.

LANDSCAPING / FUELS

Defensible Space

Construction type, condition, age, fuel loading of the area, and building position are contributing factors that make homes more or less susceptible to ignition under even moderate burning conditions. As mentioned previously, creating defensible space is the most important action an individual can do to protect his or her home. This is especially important for homes with wood roofs and homes located near any other topographic feature that contributes to fire intensity, such as chimneys and saddles. These recommendations are intended to give homeowners enough information to immediately begin making their home Firewise or to improve existing home fire mitigation efforts. Defensible space needs to be maintained throughout the year. Because of differences in vegetation, topography, and construction materials, it is suggested that a trained individual be consulted before embarking on a defensible space project.

Because of the fire ecology of the vegetation and topography, an aggressive program of evaluating and implementing defensible space for all homes combined with adequate home construction, will do more to limit fire-related property damage than any other single recommendation in this report.

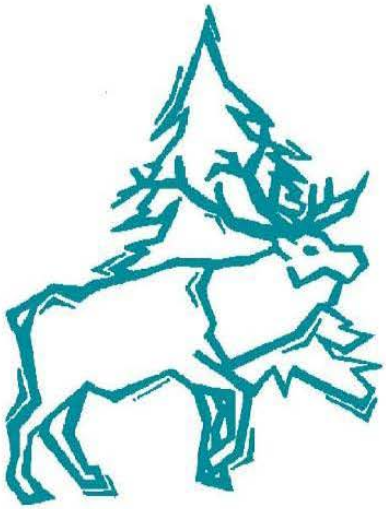
General Recommendations

Many homes and structures exist outside of the defined CWPP community boundaries in the study area**.** Extended defensible space is recommended for all homes not within identified communities that are located in dangerous topography (above ravines and natural chimneys, midslope on steep slopes, on ridge tops or summits) and/or with heavy vegetation loads near or below the home.

The following defensible space guidelines apply to all structures that could be threatened by wildfire, whether or not they are part of a defined community. The guidelines are from Colorado State Forest Service Fact Sheet 6.302, which can also be referenced online at http://csfs.colostate.edu/pages/defensible-space.html.

Road Signs

Home Addressing



NATURAL RESOURCES SERIES

FORESTRY

Creating Wildfire-Defensible Zones no. 6.302

by F.C. Dennis [1]

Quick Facts...

Wildfire will find the weakest links in the defense measures you have taken on your property.

The primary determinants of a home's ability to survive wildfire are its roofing material and the quality of the "defensible space" surrounding it.

Even small steps to protect your home and property will make them more able to withstand fire.

Consider these measures for all areas of your property, not just the immediate vicinity of the house.

Fire is capricious. It can find the weak link in your home's fire protection scheme and gain the upper hand because of a small, overlooked or seemingly inconsequential factor. While you may not be able to accomplish all measures below (and there are no guarantees), each will increase your home's, and possibly your family's, safety and survival during a wildfire.

Start with the easiest and least expensive actions. Begin your work closest to your house and move outward. Keep working on the more difficult items until you have completed your entire project.

Defensible Space

Two factors have emerged as the primary determinants of a home's ability to survive wildfire. These are the home's roofing material and the quality of the "defensible space" surrounding it.

Use fire-resistive materials (Class C or better rating), not wood or shake shingles, to roof homes in or near forests and grasslands. When your roof needs significant repairs or replacement, do so with a fire-resistant roofing material. Check with your county building department. Some counties now restrict wood roofs or require specific classifications of roofing material.

Defensible space is an area around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards the structure. It also reduces the chance of a structure fire moving from the building to the surrounding forest. Defensible space provides *room for firefighters to do their jobs.* Your house is more likely to withstand a wildfire if grasses, brush, trees and other common forest fuels are managed to reduce a fire's intensity.

The measure of fuel hazard refers to its continuity, both horizontal (across the ground) and vertical (from the ground up into the vegetation crown). Fuels with a high degree of both vertical and horizontal continuity are the most hazardous, particularly when they occur on slopes. Heavier fuels (brush and trees) are more hazardous (i.e. produce a more intense fire) than light fuels such as grass.

Mitigation of wildfire hazards focuses on breaking up the continuity of horizontal and vertical fuels. Additional distance between fuels is required on slopes.

Creating an effective defensible space involves developing a series of management zones in which different treatment techniques are used. See Figure 1 for a general view of the relationships among these management zones. Develop defensible space around each building on your property. Include detached garages, storage buildings, barns and other structures in your plan.

The actual design and development of your defensible space depends on several factors: size and shape of buildings, materials used in their construction, the slope of the ground on which the structures are built, surrounding topography,

Colorado State University Cooperative Extension

Putting Knowledge to Work

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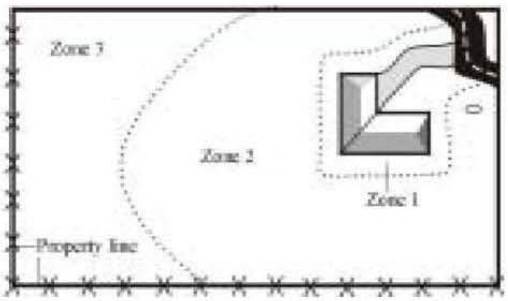


Figure 1: Forested property showing the three fire-defensible zones around a home or other structure.

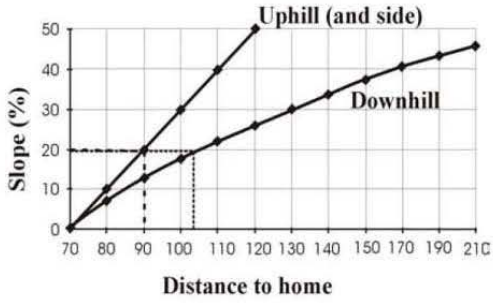


Figure 2: This chart indicates the *minimum recommended* dimensions for defensible space from the home to the outer edge of Zone 2. For example, if your home is situated on a 20 percent slope, the minimum defensible space dimensions would be 90 feet uphill and to the sides of the home and 104 feet downhill from the home.

and sizes and types of vegetation on your property. These factors all affect your design. You may want to request additional guidance from your local Colorado State Forest Service (CSFS) forester or fire department. (See the Special Recommendations section of this fact sheet for shrubs, lodgepole pine, Engelmann spruce, and aspen.)

Defensible Space Management Zones

Zone 1 is the area of maximum modification and treatment. It consists of an area of 15 feet around the structure in which all flammable vegetation is removed. This 15 feet is measured from the outside edge of the home's eaves and any attached structures, such as decks.

Zone 2 is an area of fuel reduction. It is a transitional area between Zones 1 and 3. The size of Zone 2 depends on the slope of the ground where the structure is built. Typically, the defensible space should extend *at least* 75 to 125 feet from the structure. See Figure 2 for the appropriate distance for your home's defensible space. Within this zone, the continuity and arrangement of vegetation is modified. Remove stressed, diseased, dead or dying trees and shrubs. Thin and prune the remaining larger trees and shrubs. Be sure to extend thinning along either side of your driveway all the way to your main access road. These actions help eliminate the continuous fuel surrounding a structure while enhancing homesite safety and the aesthetics of the property.

Zone 3 is an area of traditional forest management and is of no particular size. It extends from the edge of your defensible space to your property boundaries.

Prescriptions

Zone 1

The size of Zone 1 is 15 feet, measured from the edges of the structure. Within this zone, several specific treatments are recommended.

Plant nothing within 3 to 5 feet of the structure, particularly if the building is sided with wood, logs or other flammable materials. Decorative rock, for example, creates an attractive, easily maintained, nonflammable ground cover.

If the house has noncombustible siding, widely spaced foundation plantings of low growing shrubs or other "fire wise" plants are acceptable. Do not plant directly beneath windows or next to foundation vents. Be sure there are no areas of continuous grass adjacent to plantings in this area.

Frequently prune and maintain plants in this zone to ensure vigorous growth and a low growth habit. Remove dead branches, stems and leaves.

Do not store firewood or other combustible materials in this area. Enclose or screen decks with metal screening. Extend the gravel coverage under the decks. Do not use areas under decks for storage.

Ideally, remove all trees from Zone 1 to reduce fire hazards. If you do keep a tree, consider it part of the structure and extend the distance of the entire defensible space accordingly. Isolate the tree from any other surrounding trees. Prune it to at least 10 feet above the ground. Remove any branches that interfere with the roof or are within 10 feet of the chimney. Remove all "ladder fuels" from beneath the tree. Ladder fuels are vegetation with vertical continuity that allows fire to burn from ground level up into the branches and crowns of trees. Ladder fuels are potentially very hazardous but are easy to mitigate. No ladder fuels can be allowed under tree canopies. In all other areas, prune all branches of shrubs or trees up to a height of 10 feet above ground (or 1/2 the height, whichever is the least).

General Recommendations

Zone 2

Zone 2 is an area of fuel reduction designed to reduce the intensity of any fire approaching your home. Follow these recommended management steps.

Thin trees and large shrubs so there is at least 10 feet between crowns. Crown separation is measured from the furthest branch of one tree to the nearest branch on the next tree (Figure 3). On steep slopes, allow more space between tree crowns. (See Figure 4 for *minimum recommended* spacing for trees on steep slopes.) Remove all ladder fuels from under these remaining trees. Carefully prune trees to a height of at least 10 feet.

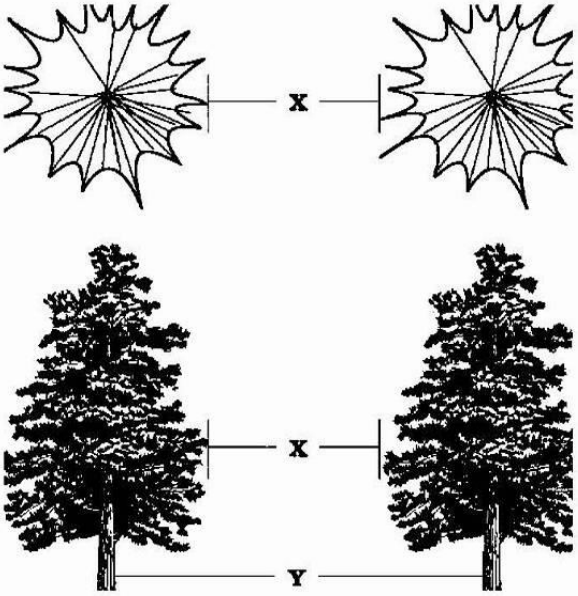


Figure 3: X = crown spacing; Y = stem spacing. Do not measure between stems for crown — measure between the edges of tree crowns.

Small clumps of 2 to 3 trees may be occasionally left in Zone 2. Leave more space between the crowns of these clumps and surrounding trees.

Because Zone 2 forms an aesthetic buffer and provides a transition between zones, it is necessary to blend the requirements for Zones 1 and 3. Thin the portions of Zone 3 adjacent to Zone 2 more heavily than the outer portions.

Isolated shrubs may remain, provided they are not under tree crowns. Prune and maintain these plants periodically to maintain vigorous growth. Remove dead stems from trees and shrubs annually. Where shrubs are the primary fuel in Zone 2, refer to the Special Recommendations section of this fact sheet.

Limit the number of dead trees (snags) retained in this area. Wildlife needs only one or two snags per acre. Be sure any snags left for wildlife cannot fall onto the house or block access roads or driveways.

Mow grasses (or remove them with a weed trimmer) as needed through the growing season to keep them low, a maximum of 6 to 8 inches. This is extremely critical in the fall when grasses dry out and cure or in the spring after the snow is gone but before the plants green up.

Stack firewood and woodpiles uphill or on the same elevation as the structure but at least 30 feet away. Clear and keep away flammable vegetation within 10 feet of these woodpiles. Do not stack wood against your house or on or under your deck, even in winter. Many homes have burned from a woodpile that ignited as the fire passed. Wildfires can burn at almost any time in Colorado.

Locate propane tanks at least 30 feet from any structures, preferably on the same elevation as the house. You don't want the LP container below your house — if it ignites, the fire would tend to burn uphill. On the other hand, if the tank is above your house and it develops a leak, LP gas will flow downhill into your home. Clear and keep away flammable vegetation within 10 feet of these tanks. Do not screen propane tanks with shrubs or vegetation.

Dispose of slash (limbs, branches and other woody debris) from your trees and shrubs through chipping or by piling and burning. Contact your local CSFS office or county sheriff's office for information about burning slash piles. If neither of these alternatives is possible, lop and scatter slash by cutting it into very small pieces and distributing it over the ground. Avoid heavy accumulations

% slope	Tree Crown Spacing	Brush and Shrub Clump Spacing
0 -10 %	10´	2 1/2 x shrub height
11 - 20%	15´	3 x shrub height
21 - 40%	20´	4 x shrub height
> 40%	30´	6 x shrub height

Figure 4: Minimum tree crown and shrub clump spacing.

Tree Diameter (in inches)	Average Stem Spacing Between Trees (in feet)
3	10
4	11
5	12
6	13
7	14
8	15
9	16
10	17
11	19
12	21
13	23
14	24
15	26
16	28
17	29
18	31
19	33
20	35
21	36
22	38
23	40
24	42

Figure 5: Minimum tree spacing for Zone 3.

of slash. Lay it close to the ground to speed decomposition. If desired, no more than two or three small, widely spaced brush piles may be left for wildlife purposes. Locate these towards the outer portions of your defensible space.

Zone 3

This zone is of no specified size. It extends from the edge of your defensible space to your property lines. A gradual transition into this zone from defensible space standards to other management objectives you may have is suggested. Typical management objectives for areas surrounding homesites or subdivisions are: provide optimum recreational opportunities; enhance aesthetics; maintain tree health and vigor; provide barriers for wind, noise, dust and visual intrusions; support limited production of firewood, fence posts and other forest commodities; or grow Christmas trees or trees for transplanting.

Specific requirements will be dictated by your objectives for your land and the kinds of trees present. See Figure 5 for the *minimum* suggested spacing between "leave" trees. Forest management in Zone 3 is an opportunity for you to increase the health and growth rate of the forest in this zone. Keep in mind that root competition for available moisture limits tree growth and ultimately the health of the forest.

A high canopy forest reduces the chance of a surface fire climbing into the tops of the trees and might be a priority for you if this zone slopes steeply. The healthiest forest is one that has multiple ages, sizes, and species of trees where adequate growing room is maintained over time. Remember to consider the hazards of ladder fuels. Multiple sizes and ages of trees might increase the fire hazard from Zone 3 into Zone 2, particularly on steep slopes.

A greater number of wildlife trees can remain in Zone 3. Make sure that dead trees pose no threat to power lines or fire access roads.

While pruning generally is not necessary in Zone 3, it may be a good idea from the standpoint of personal safety to prune trees along trails and fire access roads. Or, if you prefer the aesthetics of a well-manicured forest, you might prune the entire area. In any case, pruning helps reduce ladder fuels within the tree stand, thus enhancing wildfire safety.

Mowing is not necessary in Zone 3.

Any approved method of slash treatment is acceptable for this zone, including piling and burning, chipping or lop-and-scatter.

Special Recommendations

Tree spacing guidelines do not apply to *mature* stands of aspen trees where the recommendations for ladder fuels have been complied with. In areas of aspen regeneration and young trees, the spacing guidelines should be followed.

Brush and shrubs

Brush and shrubs are woody plants, smaller than trees, often formed by a number of vertical or semi-upright branches arising close to the ground. Brush is smaller than shrubs and can be either woody or herbaceous vegetation.

On nearly level ground, minimum spacing recommendations between clumps of brush and/or shrubs is 2 1/2 times the height of the vegetation. Maximum diameter of clumps should be 2 times the height of the vegetation. As with tree crown spacing, all measurements are made from the edges of vegetation crowns (Figure 3).

For example: For shrubs 6 feet high, spacing between shrub clumps should be 15 feet or more apart (measured from the edges of the crowns of vegetation clumps). The diameter of shrub clumps should not exceed 12 feet (measured from the edges of the crowns). Branches should be pruned to a height of 3 feet.

General Recommendations

Grasses

Keep dead, dry or curing grasses mowed to less than 6 inches. Defensible space size where grass is the predominant fuel can be reduced (Figure 5) when applying this practice.

Windthrow

In Colorado, certain locations and tree species, including lodgepole pine and Engelmann spruce, are especially susceptible to damage and uprooting by high winds (windthrow). If you see evidence of this problem in or near your forest, or have these tree species, consider the following adjustments to the defensible space guidelines. It is highly recommended that you contact a professional forester to help design your defensible space.

Adjustments: If your trees or homesite are susceptible to windthrow and the trees have never been thinned, use a stem spacing of diameter plus five instead of the guides listed in the Zone 3 section. Over time (every 3 to 5 years) *gradually* remove additional trees. The time between cutting cycles allows trees to "firm up" by expanding their root systems. Continue this periodic thinning until the desired spacing is reached.

Also consider leaving small clumps of trees and creating small openings on their lee side (opposite of the predominant wind direction). Again, a professional forester can help you design the best situation for your specific homesite and tree species. Remember, with species such as lodgepole pine and Engelmann spruce, the likelihood of a wildfire running through the tree tops or crowns (crowning) is closely related to the overabundance of fuels on the forest floor. Be sure to remove downed logs, branches and *excess* brush and needle buildup.

% slope	D-space size (uphill, downhill, sidehill)
0 - 20 %	30'
21 - 40%	50'
> 40%	70'

Figure 6: Minimum defensible space size for grass fuels.

Maintaining Your Defensible Space

Your home is located in a forest that is dynamic, always changing. Trees and shrubs continue to grow, plants die or are damaged, new plants begin to grow, and plants drop their leaves and needles. Like other parts of your home, defensible space requires maintenance. Use the following checklist each year to determine if additional work or maintenance is necessary.

Defensible Space and FireWise Annual Checklist

- □ Trees and shrubs are properly thinned and pruned within the defensible space. Slash from the thinning is disposed of.
- □ Roof and gutters are clear of debris.
- □ Branches overhanging the roof and chimney are removed.
- □ Chimney screens are in place and in good condition.
- □ Grass and weeds are mowed to a low height.
- □ An outdoor water supply is available, complete with a hose and nozzle that can reach all parts of the house.
- □ Fire extinguishers are checked and in working condition.
- □ The driveway is wide enough. The clearance of trees and branches is adequate for fire and emergency equipment. (Check with your local fire department.)
- □ Road signs and your name and house number are posted and easily visible.
- □ There is an easily accessible tool storage area with rakes, hoes, axes and shovels for use in case of fire.
- □ You have practiced family fire drills and your fire evacuation plan.
- □ Your escape routes, meeting points and other details are known and understood by all family members.
- □ Attic, roof, eaves and foundation vents are screened and in good condition.

FIREWISE is a multi-agency program that encourages the development of defensible space and the prevention of catastrophic wildfire.

Stilt foundations and decks are enclosed, screened or walled up.

- ☐ Trash and debris accumulations are removed from the defensible space.
- ☐ A checklist for fire safety needs inside the home also has been completed. This is available from your local fire department.

References

Colorado State Forest Service, Colorado State University, Fort Collins, CO 80523-5060; (970) 491-6303:

- *FireWise Construction — Design and Materials*
- Home Fire Protection in the Wildland Urban Interface
- Wildfire Protection in the Wildland Urban Interface
- *Landowner Guide to Thinning*

Colorado State University Cooperative Extension, 115 General Services Bldg., Fort Collins, CO 80523-4061; (970) 491-6198; E-mail: resourcecenter@ucm.colostate.edu:

- 6.303, *Fire-Resistant Landscaping*
- 6.304, *Forest Home Fire Safety*
- 6.305, *FireWise Plant Materials*
- 6.306, *Grass Seed Mixes to Reduce Wildfire Hazard*
- 7.205, *Pruning Evergreens*
- 7.206, *Pruning Shrubs*
- 7.207, *Pruning Deciduous Trees*

Colorado State Forest Service

This fact sheet was produced in cooperation with the Colorado State Forest Service.

[1]*Wildfire Hazard Mitigation Coordinator, Colorado State Forest Service.*

Colorado State University, U.S. Department of Agriculture, and Colorado counties cooperating. Cooperative Extension programs are available to all without discrimination. No endorsement of products mentioned is intended nor is criticism implied of products not mentioned.

General Recommendations

FUEL BREAKS

One of the most effective forms of landscape scale fuels modification is the fuel break (sometimes referred to as a “shaded fuel break”). A fuel break is an easily accessible strip of land of varying width, depending on fuel and terrain, in which fuel density is reduced, thus improving fire control opportunities. Vegetation is thinned to remove diseased, fire-weakened, and most standing dead trees. Thinning should select for the more fire-resistant species. Ladder fuels, such as low limbs and heavy regeneration are removed from the remaining stand. Brush, dead and down materials, logging slash, and other heavy ground fuels are removed to create an open park-like appearance. The use of fuel breaks under normal burning conditions can limit uncontrolled spread of fires and aid firefighters in slowing the spread rate. However, under extreme burning conditions where spotting occurs for miles ahead of the main fire and probability of ignition is high, even the best fuel breaks are not effective. Factors to be considered when determining the need for fuel breaks in mountain subdivisions include:

- The presence and density of hazardous fuels
- Slope
- Other hazardous topographic features
- Crowning potential
- Ignition sources

With the exception of aspen, all of Colorado’s major timber types, as well as sage and grass, represent a significant risk of wildfire. Increasing slope causes fires to move from the surface fuels to crowns more easily, due to preheating. A slope of 30 percent causes the fire spread rate to double, compared to the same fuels and conditions on flat ground. Chimneys, saddles, and deep ravines are all known to accelerate fire spread and influence intensity. Communities with homes located on or above such features, as well as homes located on summits and ridge-tops, would be good candidates for fuel breaks.

Crown fire activity values for the study area were generated by the FlamMap model and classified into three standard ranges (surface fire only, passive crown fire, and active crown fire). In areas where active crown fire activity is likely, fuel breaks should be considered. If there are known likely ignition sources (such as railroads and recreation areas that allow campfires) in areas where there is a threat of fire being channeled into communities, fuel breaks should be considered. Fuel breaks should also be considered, where appropriate, to help protect critical infrastructure and ecosystem values.

Fuel breaks should always be connected to a good anchor point like a rock outcropping, river, lake, or road. The classic location for fuel breaks is along the tops of ridges, in order to stop fires from backing down the other side or spotting into the next drainage. This is sometimes not practical from a WUI standpoint, because the structures that firefighters are trying to protect are usually located at the tops of ridges or midslope. Midslope positioning is considered the least desirable for fuel breaks, but it may be easiest to achieve as an extension either of defensible space work or of existing roads and escape routes.

One tactic would be to create fuel breaks on slopes below homes that are located either midslope or on ridge tops so that the area of continuous fuels between the defensible space of homes and the fuel break is less than ten acres. Another tactic that is commonly used is positioning fuel breaks along the bottom of slopes. In most of the study area, this would require the cooperation of many individual landowners. In some areas, the only way to separate residences from fuels is to locate the fuel break midslope above homes. This would provide some protection from backing fires and rolling materials. Where possible, it would make sense to locate fuel breaks midslope below homes, to break the continuity of fuels into the smaller units mentioned above. Even though this position is considered the least desirable from a fire suppression point of view, it would be the most effective approach in some portions of the study area.

Fuel breaks are often easiest to locate along existing roads. The minimum recommended fuel break width is usually 200 feet. As spread rate and intensity increases with slope angle, the size of the fuel break should be increased, with an emphasis on the downhill side of the roadbed or centerline employed. The formulas for slope angles of 30 percent and greater are as follows: below road distance = 100′ + (1.5 x slope %), above road distance = 100′ – slope % (see Table A7). Fuel breaks that pass through hazardous topographic features should have these distances increased by 50 percent. Because fuel breaks can have an undesirable effect on the aesthetics of the area, crown separation should be emphasized over stand density levels, because isolating groupings rather than cutting for precise stem spacing will help to mitigate the visual impact of the fuel break. Irregular cutting patterns that reduce canopy and leave behind islands with wide openings are effective in shrub models. This is sometimes referred to as a mosaic cut.

Another issue in mechanical thinning is the removal of cut materials. It is important to note that in Colorado's dry climate, slash decomposes very slowly. One consequence of failing to remove slash is that it adds to the surface fuel loading, perhaps making the area more hazardous than before treatment. Slash materials must be disposed of by piling and burning, chipping, physical removal from the area, or lopping and scattering. Of all of these methods, lopping and scattering is the cheapest, but it is also the least effective because it adds to the surface fuel load.

It is also important to note that fuel breaks must be maintained to be effective. Thinning usually accelerates the process of regenerative growth. The effectiveness of the fuel break may be lost in as little as three to four years if ladder fuels and regeneration are not controlled. Fuel breaks should not be constructed without a maintenance plan.

One of the most difficult issues in establishing and maintaining fuel breaks is securing cooperation and participation of landowners. Ownership maps of the area indicate that implementation of fuels-reduction projects recommended here may require the approval of public land management agencies as well as private landowners.

% Slope	Distance Above Road	Distance Below Road
30	70 feet	145 feet
35	65 feet	153 feet
40	60 feet	160 feet
45	55 feet	168 feet
50	50 feet	175 feet

Table A7. Recommended Treatment Distances for MidSlope Roads

General Recommendations

Comparison of Sagebrush Management Techniques

I. Prescribed Fire

Advantages

- A "natural" process, therefore, generally fewer environmental side effects
- Can be used in a wide variety of circumstances under the proper environmental conditions
- Returns nutrients to the soil quickly

Disadvantages

- Implementation can be potentially hazardous with associated liability
- Generally, requires fine fuels present (rest) to be effective
- Can potentially negatively affect non-target species
- Short term aesthetic, smoke and erosion concerns

II. Chemical (Herbicides)

Advantages

- Can be quite selective
- Can be relatively inexpensive
- Can be regulated for partial or total treatment
- Can cover large areas quickly

Disadvantages

- Many chemicals are residual, and may inhibit plant regrowth
- Can have environmental / toxic side effects if not used carefully
- Application rates and timing can be limiting
- Leaching and drift into non-target areas
- Can affect non-target species within the treatment area

III. Mechanical (Mowing, Chaining, Plowing/Ripping/Scalping/Pitting, Brushrake, Brush Disc, Choppers, Mulchers, Drills, Pipe Harrows, etc)

Advantages

- Can be quite fast
- Easily controlled
- Can be very effective when used under the right conditions
- Soil disturbance can prepare seed bed

Disadvantages

- Topography (i.e., relief/slope, rocky soils) can be limiting for many techniques
- Costs (equipment and operators) can be expensive in some cases
- Benefits may be short-lived
- Short term aesthetic and erosion concerns
- Cultural concerns
- Litter management may be required

IV. Biological (Insects and Herbivory)

Advantages

- Often target species (host) specific / selective
- Grazing treatments can be relatively inexpensive

Disadvantages

- Limited number of bioagents available
- Can take a long time (several years in some cases) to see wide-spread results
- Grazing methods can be counter-productive / abusive if not carefully monitored and managed

PREPAREDNESS PLANNING

In order to reduce potential conflicts between evacuating citizens and incoming responders, it is desirable to have nearby meeting points and evacuation centers for citizens and staging areas for fire resources. This is especially important in communities with a single access and a high population density. Evacuation centers should include heated buildings with facilities large enough to handle the population, where available. A preplanned evacuation center should be identified in one or all of the major towns so that study area residents will know where to go, and that so planning can begin ahead of time. Schools and churches are usually ideal for this purpose. Meeting points for individual communities should be located near the community and known to all area residents. They should also be located away from flammable vegetation, and out of the way of incoming resources.

Fire staging areas should contain large safety zones, a good view in the direction of the fire, easy access and turnarounds for large apparatus, a significant fuel break between the fire and the escape route, topography conducive to radio communications, and access to water. Large irrigated meadows may make good safety zones for firefighting forces. Local responders are encouraged to preplan the use of potential staging areas with property owners.

Evacuating

Life safety is the number one priority in any wildland fire situation. This being the case, evacuation is often one of the most difficult, but important, areas to address. Many roads leading into and throughout communities in the study area are one way in and out, narrow, poorly maintained, and/or blocked by low hanging archways or gates. Panicked residents and chaotic conditions will further hinder evacuation effectiveness and timeliness. Widening roadways, improving road maintenance and reducing impediments to travel such as gates and archways will speed the overall evacuation process and aid in the ingress of firefighters. Escape routes should be properly signed so that they are visible in smoky conditions. Evacuation centers should be predetermined so that residents know where they are going and how they will get there. Communities should stage mock evacuation scenarios annually or bi-annually so that residents know what to do in the event of an approaching wildfire. Communities should also work to develop a way to contact all of community residents, in case many residents chose not to go to the evacuation center. This list could be a phone and/or email list, which will allow community members to find out information about one another and on the status of their evacuation.

For more information on evacuation planning, please visit: http://www.ready.gov/america/beinformed/wildfires.html

Personal Preparedness

The one thing you cannot plan for is *where you will be* when a disaster hits –

- Evacuation Plan - **HOME, VEHICLE and WORK**
- Where to meet
- Gas, water, electrical shut offs
- List of items to take - supplies
- Computers - backups (off-site)
- Documents, records, computer files
- Plastic to cover areas to protect from fire sprinkler damage
- How/where to transport hospitalized (patients), boarders, etc.

Communication plan

- Who to call
- Family phone tree, including contact(s) in distant location

Emergency Supply Examples:

- Water (recommended 3 days @ 1 gal/person/day)
- Shoes
- Rx meds

General Recommendations

Rx glasses
Flashlight/batteries
Candles/matches
Blanket
Portable Radio
Mirror
1st aid kit
Fire extinguisher
Food
Camp stove for cooking, fuel
Pots/pans
Can opener (not electric!)
Bleach to disinfect drinking water
Toilet paper
Trash bags
Immunization/Health Records
US Hotel Directory-Pet Friendly

Guidelines for Horses and other livestock

- Create neighborhood programs and evacuation plans.
- Keep halters/ropes ready for each horse that includes: the horse's name, your name/phone number and a separate emergency contact number.
- Keep a reserve supply of horse feed and water on hand. Be prepared to be self-sufficient for at least 72 hours.
- Survey your property to find the best location to confine your animals in each type of disaster. Check for alternate water sources in case power is lost and pumps and automatic waterers are not working after the disaster. Do not rely on automatic waterers during a disaster.
- If you have a well, do you have a generator?
- If you think you might need to evacuate your horses from your property, determine several locations (evacuation sites) the animals could be taken, several routes to these locations, and the entry requirements for each. Make arrangements in advance with the owners/operators to accept your horses, and be sure to contact them before taking the horses there. Locations that could be used for evacuation are private stables, racetracks, fair grounds, rodeo grounds, equestrian centers, private farms, and humane societies.
- Permanently identify each horse by tattoo, microchip, brand, tag, photographs (ideally, 4 views—front, rear, left and right side), and/or drawing. Record its age, sex, breed, and color with your record of this identification. Keep this information with your important papers. Also consider visible ID markers during an evacuation, e.g., paint or etch hooves, use neckbands, or paint your telephone number (cell phone?) on side of animal.
- Be sure your horses' vaccination and medical records are written and up-to-date. Check with your veterinarian as to what immunizations are advisable. Have documentation of any medicines with dosing instructions, special feeding instructions, and the name and phone number of the veterinarian who dispensed the drug.
- Place a permanent tag with your name and phone number and the horse's name on each animal's halter.
- Have a First Aid Kit (check with your veterinarian)
    - Leg wraps, track bandage, tape (do NOT use elastic bandages!)
    - Vet wrap
    - Kling or roll gauze, gauze squares
    - Cotton
    - Soap
    - Antiseptic

- Bandage scissors
- Two pieces of garden hose

- Prepare an emergency kit consisting of:
  - First aid kit, water bucket, leg wraps/quilts, fire resistant non-nylon leads and halters, portable radio and extra batteries, flashlight and extra batteries, sharp knife, wire cutters, rake/shovel, emergency phone numbers/contact list. Consider "Special needs" pets.
- Have trailers, vans, towing vehicles maintained (including tires), full of gas, and ready to move at all times. Accustom your horse to loading and traveling.

PUBLIC EDUCATION

There is likely to be a varied understanding among property owners of the hazards associated with the threat of a wildfire. An approach to wildfire education that emphasizes safety and hazard mitigation on an individual property level should be undertaken, in addition to fire department efforts at risk reduction.

Use these web sites for a list of public education materials, and for general homeowner education:
http://csfs.colostate.edu/pages/wf-protection.html
http://www.Safeco.com/Safeco/about/giving/firefree.org
http://www.fs.fed.us/fire/links/links_prevention.html
http://www.or.blm.gov/nwfire/docs/Livingwithfire.pdf
http://www.firewise.org
http://www.blm.gov/nifc/st/en/prog/fire.1.html

Ready, Set, Go! Program

The Ready, Set, Go! Program utilizes firefighters to teach individuals who live in high risk wildfire areas and the wildland-urban-interface (WUI) how to best prepare themselves and their properties against fire threats. Ready, Set, Go! works in complimentary and collaborative fashion with Firewise and other existing wildland fire public education efforts. It amplifies their messages to individuals to better achieve the common goal we all share of fire-adapted communities. The RSG program provides the implementation guidance; background knowledge; and presentation tools to assist fire departments in delivering the program message:

Ready – Preparing for the Fire Threat: Be Ready, Be Firewise. Take personal responsibility and prepare long before the threat of a wildfire so your home is ready in case of a fire. Create defensible space by clearing brush away from your home. Use fire-resistant landscaping and harden your home with fire-safe construction measures. Assemble emergency supplies and belongings in a safe spot. Make sure all residents residing within the home are on the same page, plan escape routes. For more information about how to be ***Ready*** for wildland fires, go to Firewise.org.

Set – Situational Awareness When a Fire Starts: Pack your vehicle with your emergency items. Stay aware of the latest news from local media and your local fire department for updated information on the fire.

Go – Leave early! Following your Action Plan makes you prepared and firefighters are now able to best maneuver the wildfire and ensuring you and your family's safety.
All homeowners and communities should become familiar with the Ready, Set, Go! program. For more information and to download the free information guide and checklist, please visit: http://www.southmetro.org/file/Publiceducation/Ready_Set_Go_SMFRA.pdf

Project Collaboration

COLLABORATION- COMMUNITIES/AGENCIES/STAKEHOLDERS

THE NEED FOR A CWPP

In response to the Healthy Forests Restoration Act (HFRA), and in an effort to create incentives, Congress directed interface communities to prepare a Community Wildfire Protection Plan (CWPP). Once completed, a CWPP provides statutory incentives for the federal agencies to consider the priorities of local communities as they develop and implement forest management and hazardous fuel reduction projects. CWPPs can take a variety of forms based on the needs of the people involved in their development. CWPPs may address issues such as wildfire response, hazard mitigation, community preparedness, structure protection, or all of the above. Colorado Senate Bill 09-001 provided revised minimum standards and guidelines for the development of CWPPs in Colorado. The minimum requirements for a CWPP specify that collaboration between local and state government representatives, in consultation with federal agencies and other interested parties. The plan must exhibit diverse collaboration with an emphasis on involvement of community members/representatives. This appendix describes and documents the process used to collaborate between the core planning group, stakeholders, and community representatives during the development of this plan.

INTERAGENCY COLLABORATION

Roles and Responsibilities

To be successful, wildfire mitigation in the interface must be a community-based, collaborative effort. Stakeholders and the fire protection district will have the greatest responsibility for implementing the recommended mitigation projects. The CSFS and the USFS/ BLM (Upper Colorado Interagency Fire Management Unit) are valuable participants in addressing cross-boundary projects throughout the area.

Nearly all of the recommendations from this report affect private land or access roads to private land. There are also mitigation recommendations for individual structures, which are the responsibility of the homeowner. Homeowners will, however, need a Wildfire Mitigation Advocate to help them implement these recommendations. The best defensible space will be created with oversight and expert advice from the fire district and/or government forestry personnel. One-on-one dialog will continue to build the relationship with community members. This level of involvement will allow agencies to keep track of the progress and update this plan to reflect the latest modifications at the community level.

THE COLLABORATIVE PROCESS

Strategic Planning

Several meetings and conference calls were held during the development of the CWPP. The initial stakeholder “kickoff” meeting, held July 19, 2011 at the Edwards Fire Station/Ambulance Station, brought together CWPP “Core Team” members. This core team included department and board members of the ERFPD, CSFS, Eagle County officials, representatives from the Towns of Avon and Minturn, and other prominent stakeholders. Discussion focused on the scope of the project, desired outcomes, and agency participation. The meeting covered introductions, methodology, stakeholder goals, project management, mapping data, and a regional map review. The group delineated and defined the study area’s community boundaries, areas of special interest and critical infrastructure that would be targeted for assessment. The attendees at this meeting, the public meeting, and/or those who provided support or data in the development of the document are listed below.

COMMUNITY OUTREACH

The success of any CWPP is dependent upon community involvement for both strategic input and long-term ownership and implementation. A plan that accurately reflects the community’s interests, concerns and priorities will have greater legitimacy and long-term success. The outreach strategy this CWPP employed was a multi-tiered approach that engaged public agencies, interested parties and local organizations in order to raise public awareness and generate public input.

In addition to the stakeholder meeting, a public meeting, advertised through fire department outreach and multiple local newspapers, was held to generate direct feedback from area residents on the CWPP development process, community assessment results and

NAME	ORGANIZATION
Karl Bauer Jodi Pratt Jenny Klingmueller Andy Pohlman Bryan Nagle	Eagle River Fire Protection District
Paul Cada	Colorado State Forest Service
Ross Wilmore Cary Green	US Forest Service
Eric Lovgren	Eagle County
Clark Shivley	Eagle-Vail / ERFPD Board
Sally Vecchio	Town of Avon
Jim Clarke	Mountain Star
Chris Cerimele	Town of Minturn
Ted Hanley	Town of Eagle-Vail
Bill Wentworth	Cordillera
Pete Miller	Eagle River Water and Sand Department
Tambi Katieb	Eagle River Watershed Council

specific community mitigation recommendations. The meeting was held on November 14, 2011, at the Singletree Community Center. Approximately 15 people attended. At the meeting, a brief overview of the contents of the report was presented. A number of key stakeholders were present at the meeting to answer questions and solicit feedback, including the fire protection district, CSFS, Eagle County, ERWSD and Anchor Point.

Development of the ERFPD CWPP was conducted through an online project collaboration tool known as Basecamp. Basecamp provided a homogeneous means for the sharing of information, data files, mapping, and imagery resources within the core team and provided an open forum for project communications amongst a diverse team of local representatives, fire authorities, forest management, and plan coordinators. Use of the Basecamp tool promoted on-time and on-scale project management and team collaboration in the final development of the CWPP. The first draft of the report was made available on Basecamp so the public could review it and submit comments.

A district-wide resident survey was made available via an online link. This survey was made available to the public and was launched on July 14, 2011 and remained available until December 5. The survey consisted of 26 questions inquiring on topics such as, but not limited to; important values for the area, concerns for wildfire risk, concerns on wildfire damage to various resources, overall feeling of safety, evacuation awareness, wildfire awareness, preferences on fuel treatments and defensible space, and overall concerns in addressing a wildfire occurrence. Twenty-six people completed the survey during that time. Results were used in the development of

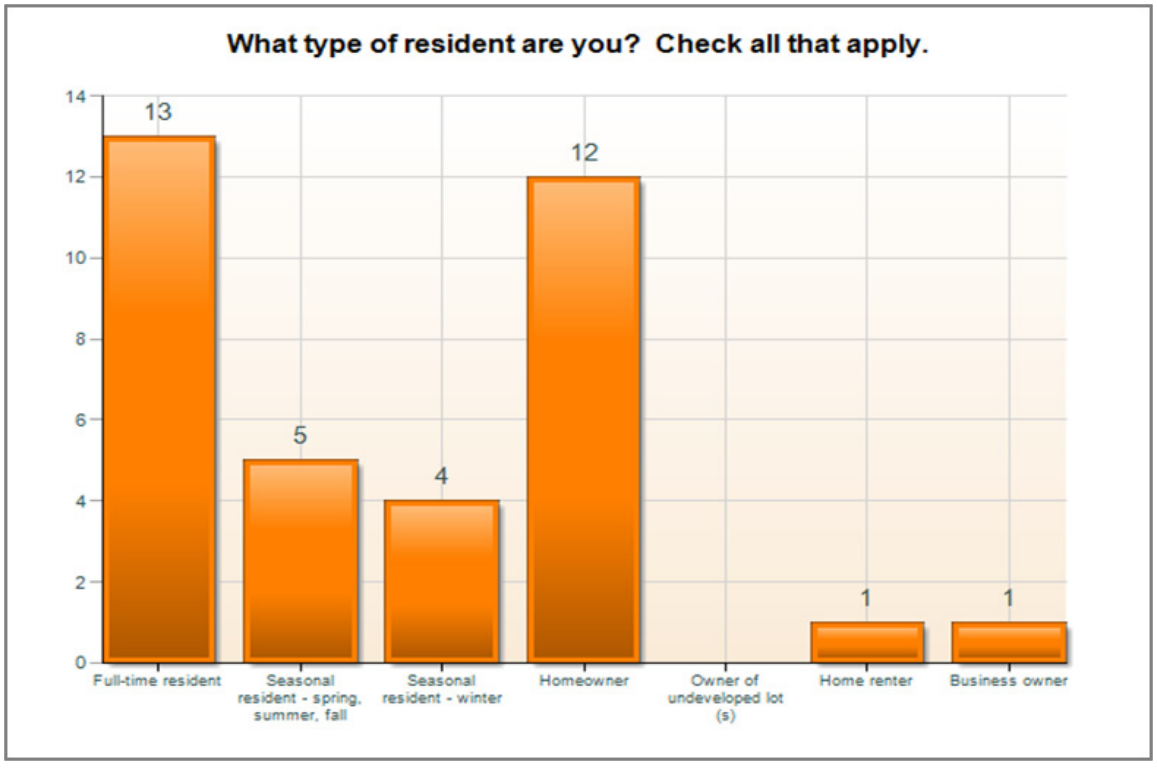
Project Collaboration

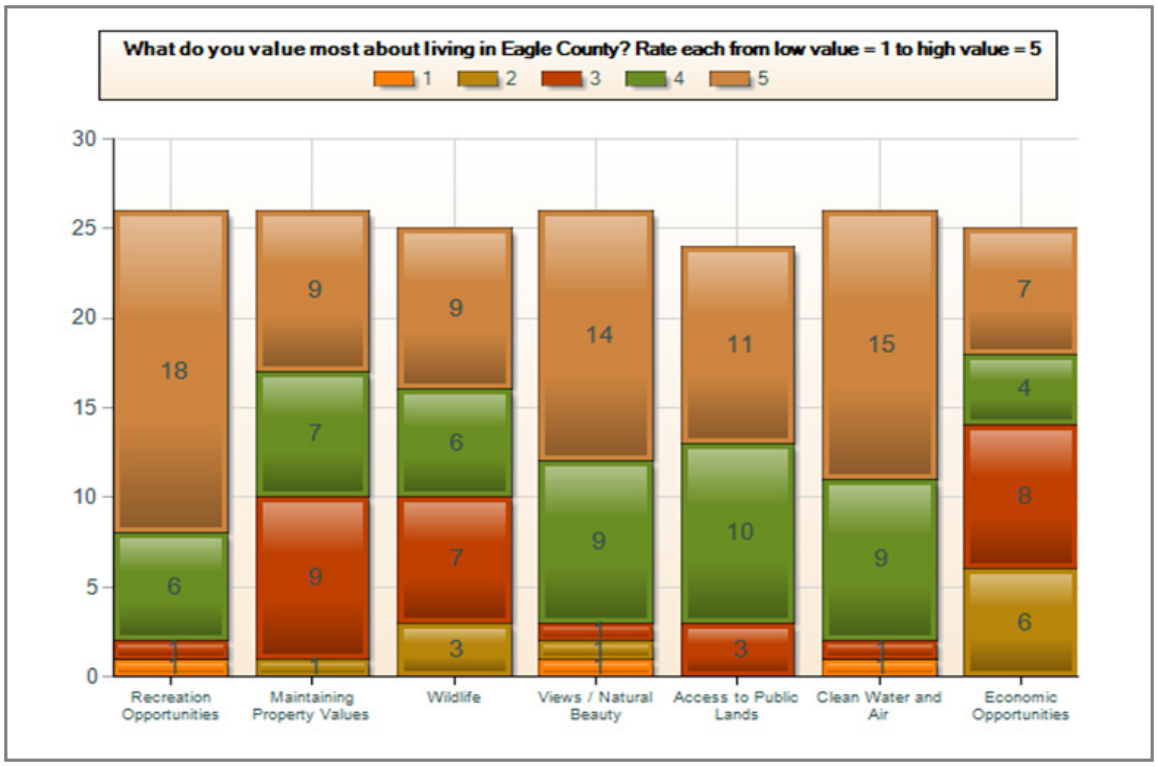
this plan, particularly to inform the values at risk section, and are detailed on the following pages.

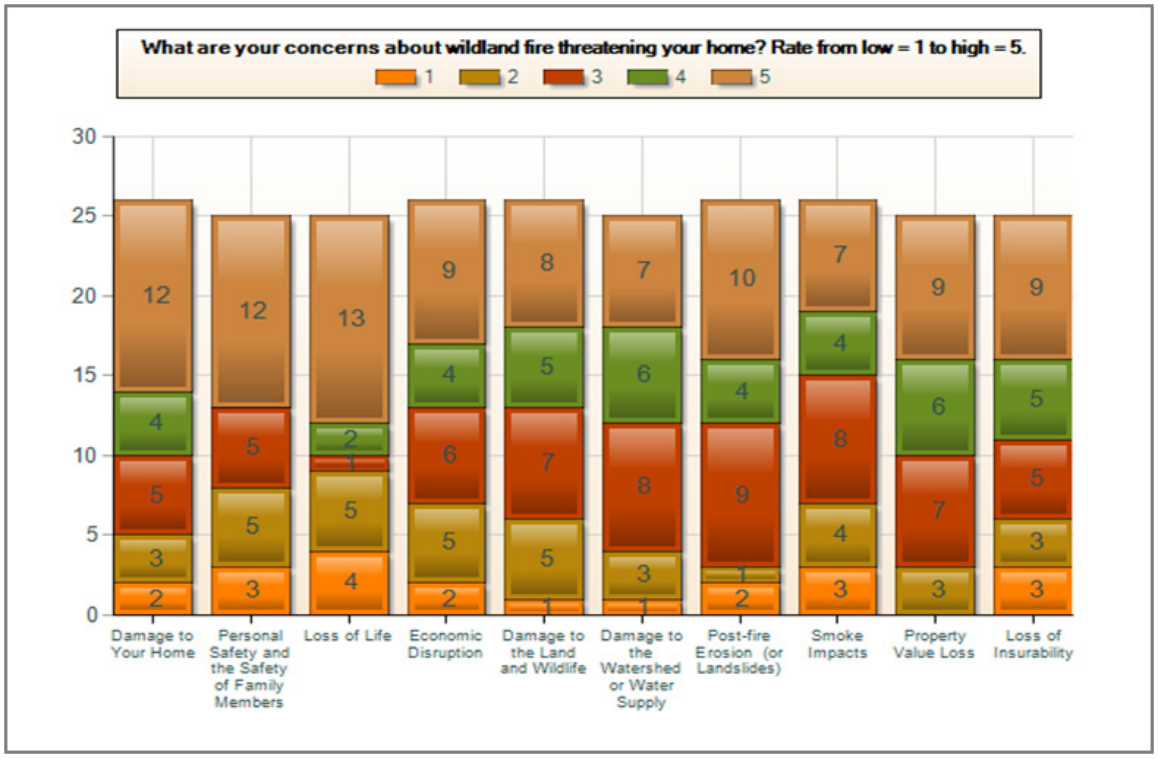
In addition to the answers to questions taken directly from the survey, the following were listed as additional concerns that residents had.

- Failure by many residents to remove dead trees on their property that have been hit by the mountain pine beetle.
- Loss of property value and loss of environmental beauty.
- Residents' ability to access their homes.
- Impacts to homes from wildfire.
- Local community associations controlling and preventing normal fire prevention practices.
- High turn-over rate of experienced firefighters.
- The high number of dead trees creates a whole new level of risk. A future destructive wildfire scenario can only be mitigated with proactive efforts to improve the health of the forests.
- The district does not have enough firefighters to take on a large fire.

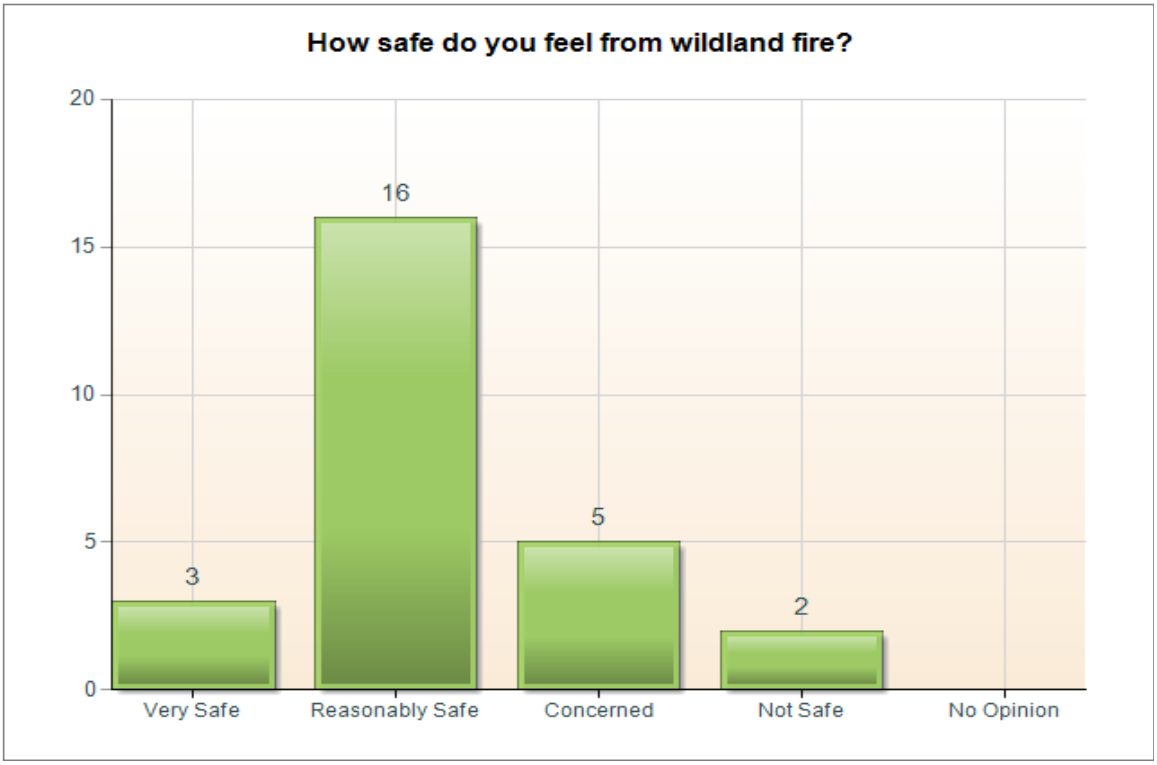
The graphics on the following page provide a visual summary of the respondents' answers to the posted survey. Unfortunately the low number of respondents to the survey did not yield statistically significant results.

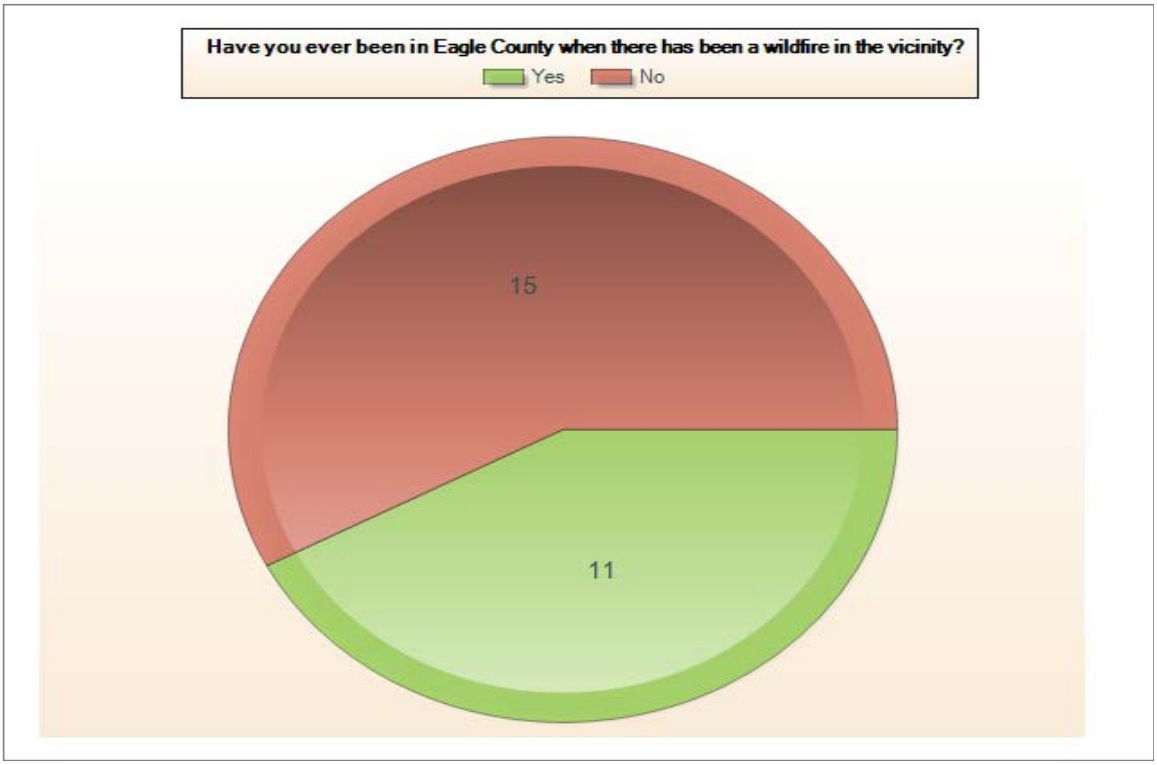


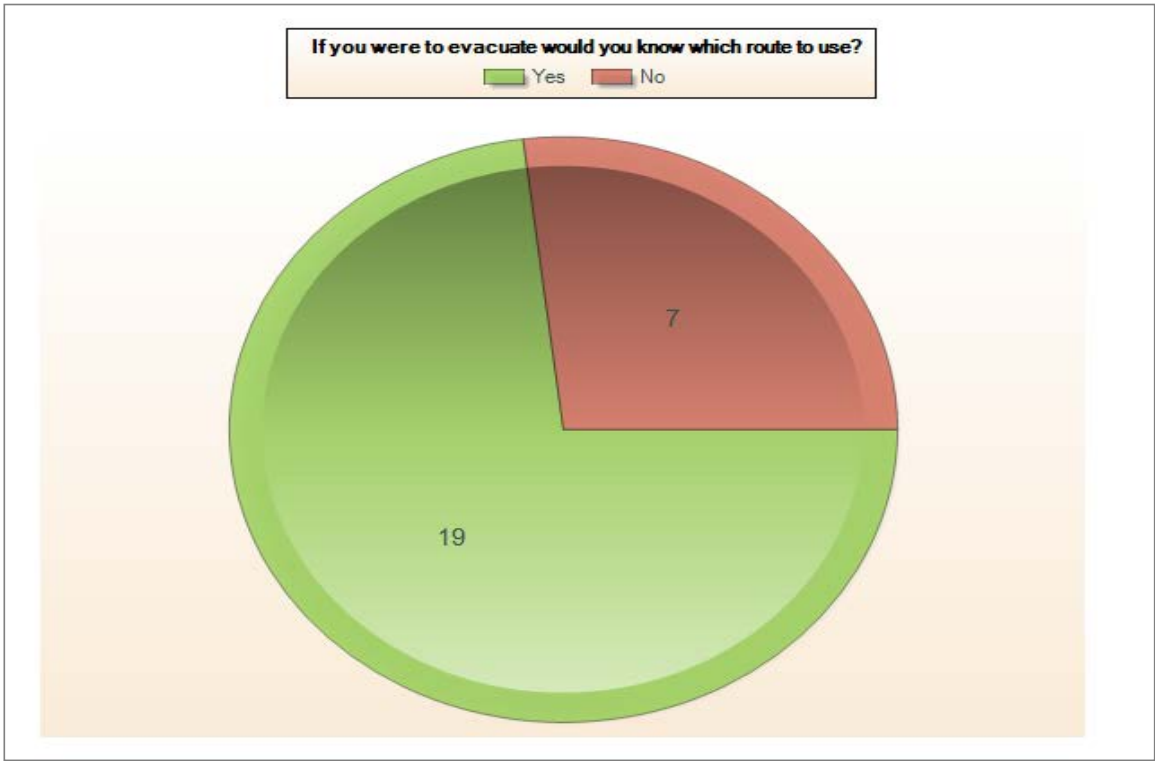

What do you value most about living in Eagle County? Rate each from low value = 1 to high value = 5
1
2
3
4
5
30
25
20
15
10
5
0
18
6
1
9
7
9
1
9
7
6
3
14
9
1
1
11
10
3
15
9
1
7
4
8
6
Recreation Opportunities
Maintaining Property Values
Wildlife
Views / Natural Beauty
Access to Public Lands
Clean Water and Air
Economic Opportunities

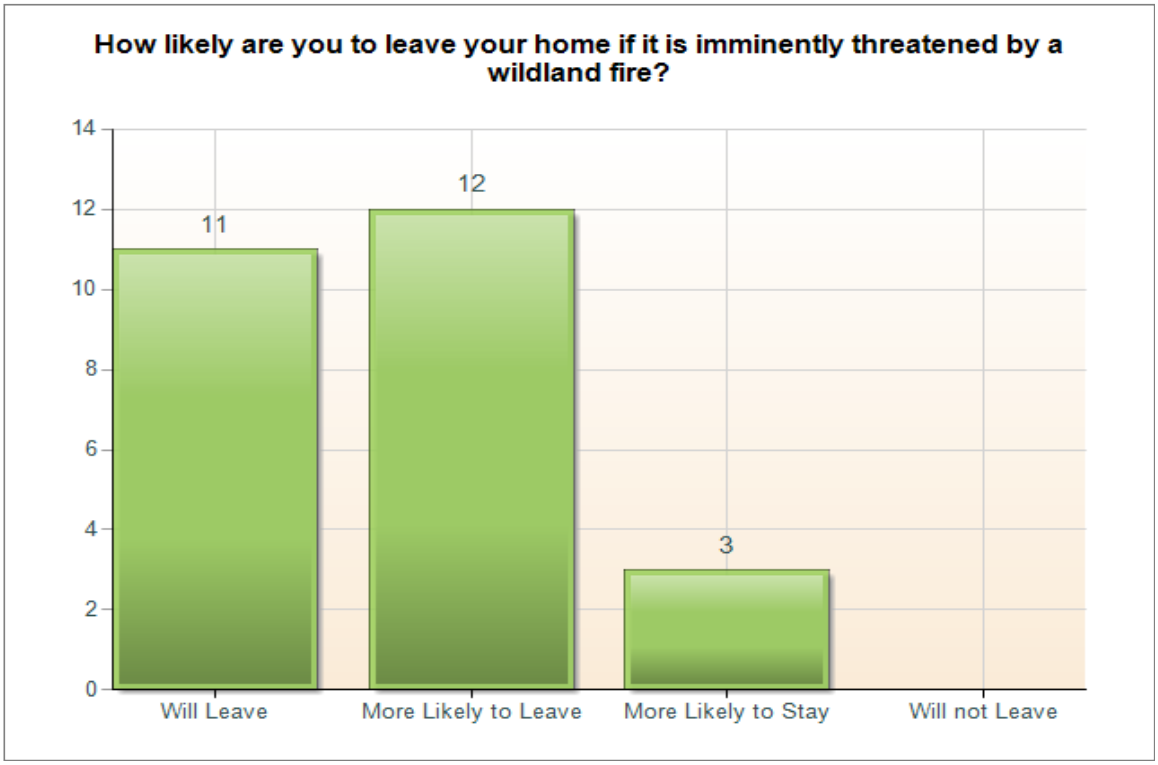

What are your concerns about wildland fire threatening your home? Rate from low = 1 to high = 5.
1
2
3
4
5
30
25
20
15
10
5
0
12
4
5
3
2
12
5
5
3
13
2
1
5
4
9
4
6
5
2
8
5
7
5
1
7
6
8
3
1
10
4
9
1
2
7
4
8
4
3
9
6
7
3
9
5
5
3
3
Damage to Your Home
Personal Safety and the Safety of Family Members
Loss of Life
Economic Disruption
Damage to the Land and Wildlife
Damage to the Watershed or Water Supply
Post-fire Erosion (or Landslides)
Smoke Impacts
Property Value Loss
Loss of Insurability

Project Collaboration

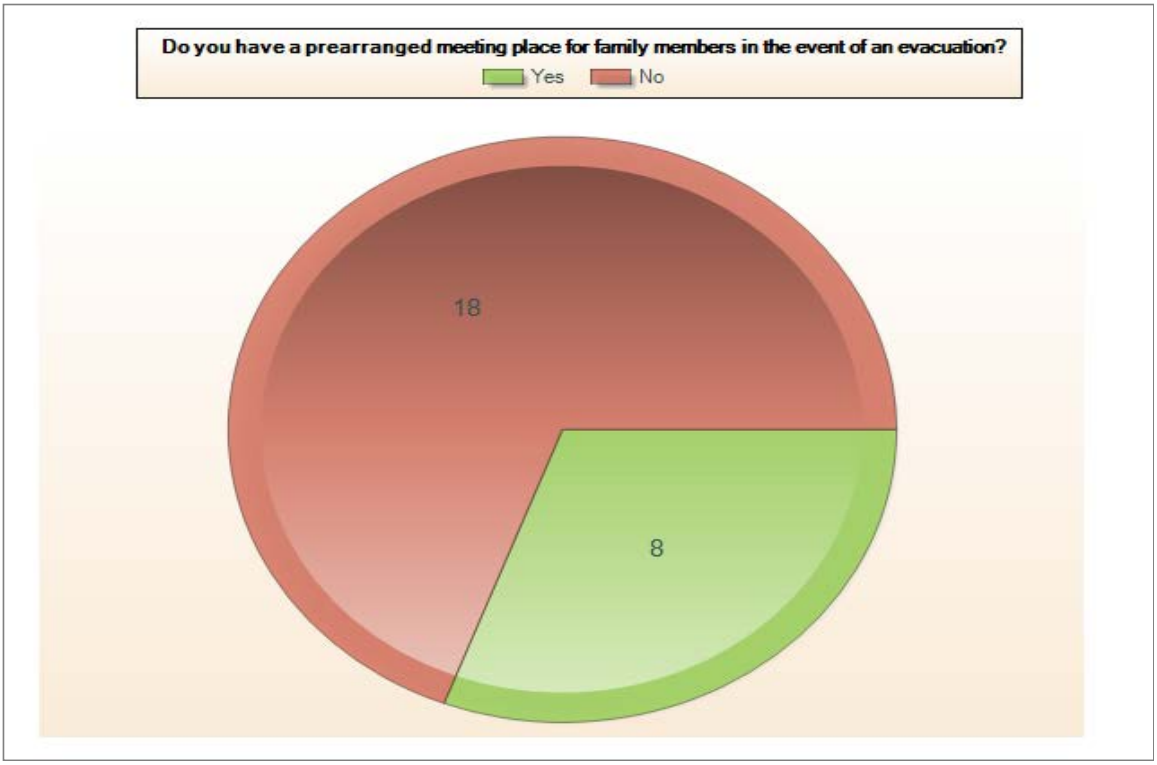


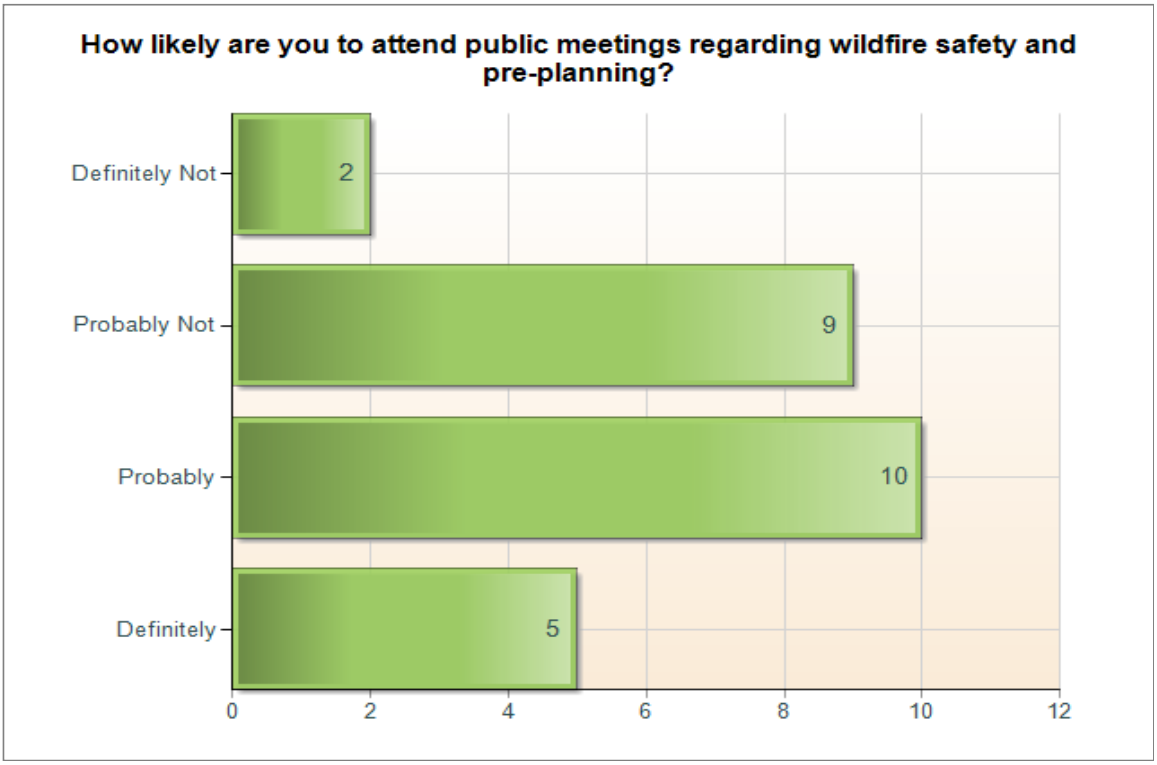



If you were to evacuate would you know which route to use?
Yes
No
7
19

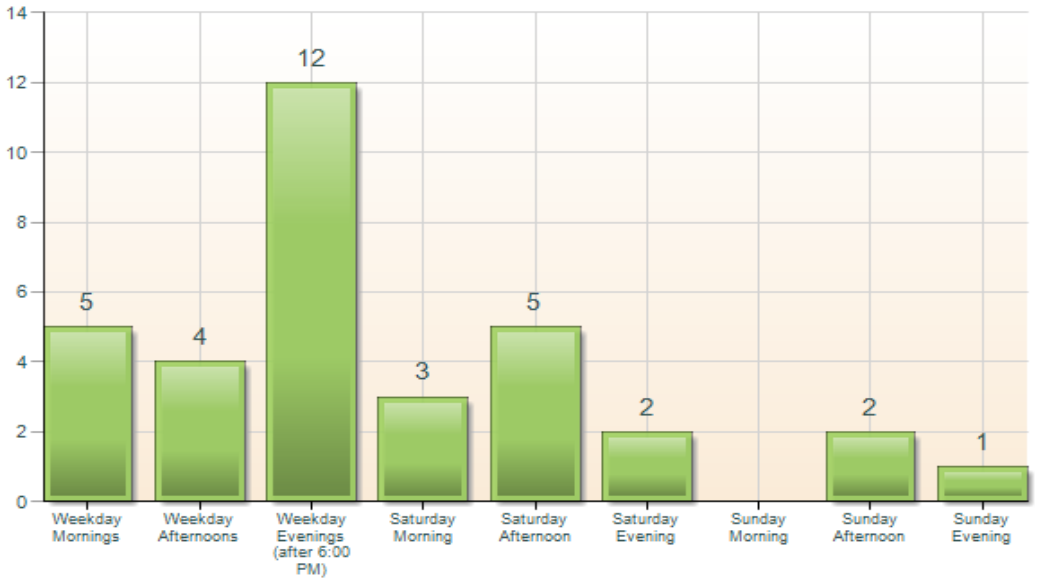

How likely are you to leave your home if it is imminently threatened by a wildland fire?
14
12
10
8
6
4
2
0
11
12
3
Will Leave
More Likely to Leave
More Likely to Stay
Will not Leave

Project Collaboration

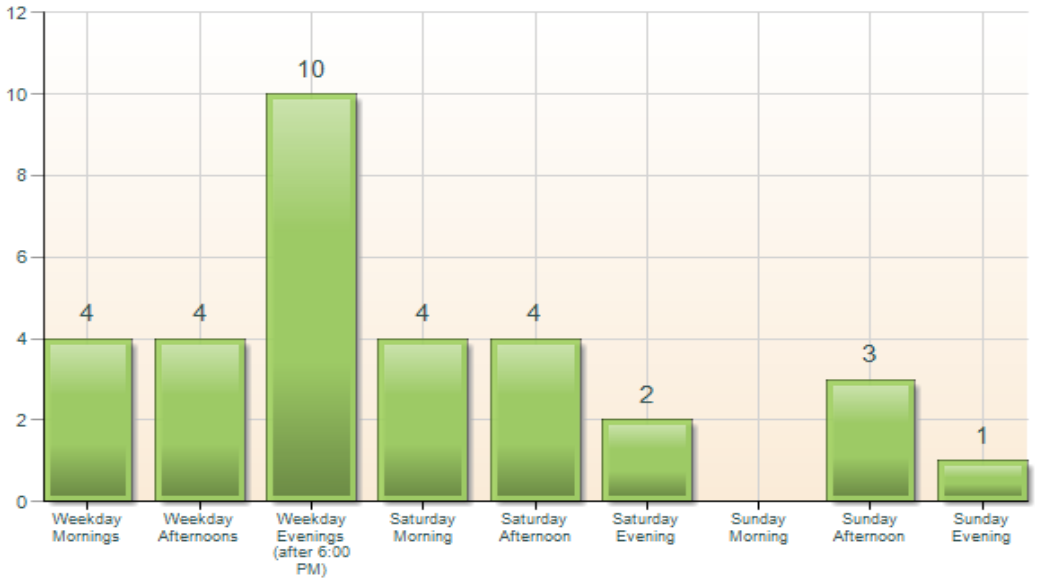




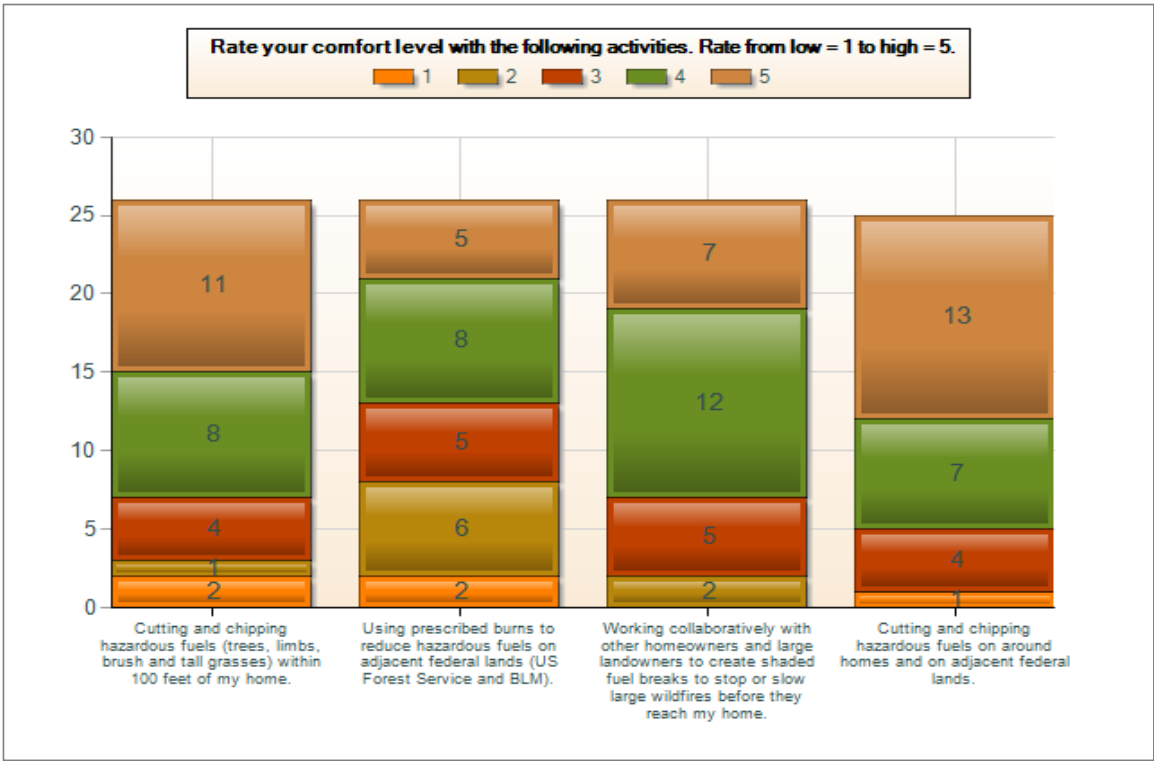
If you are interested in attending public meetings concerning fire mitigation and planning, what meeting times would be convenient? (please check all that apply)

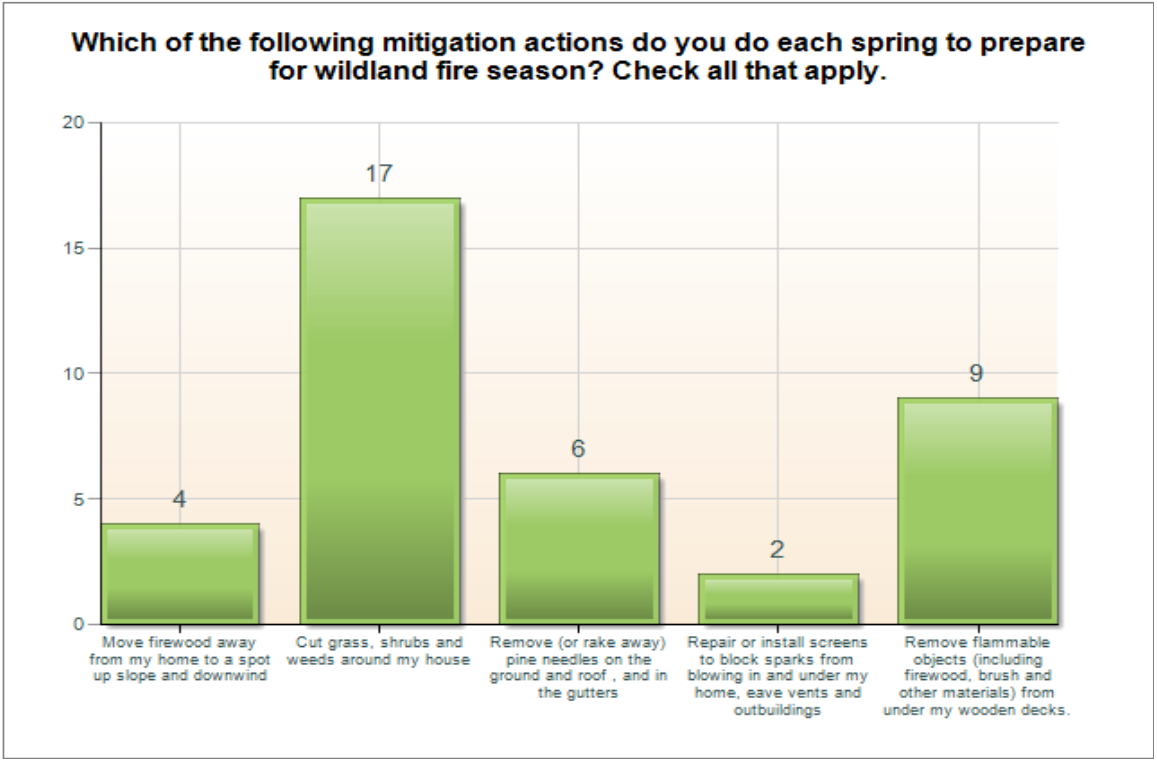


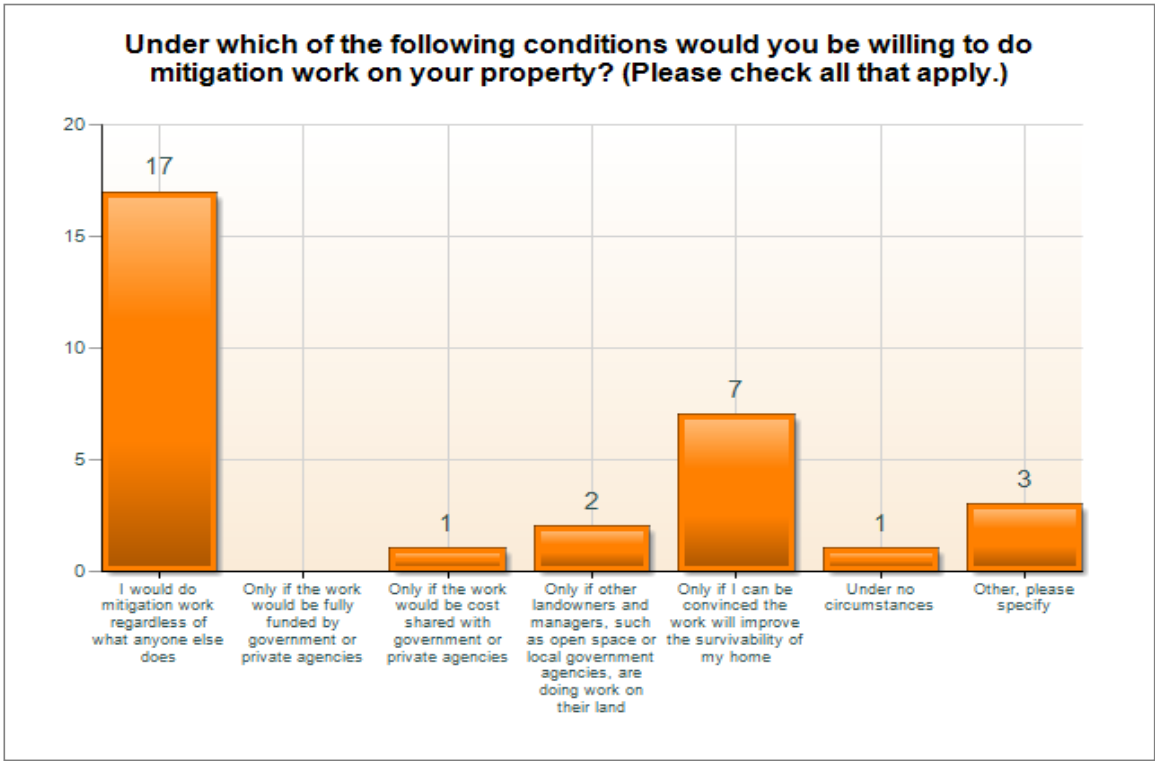
Would you be interested in attending an event where you could see examples of defensible space work and thinning? If you are interested, check all that apply.

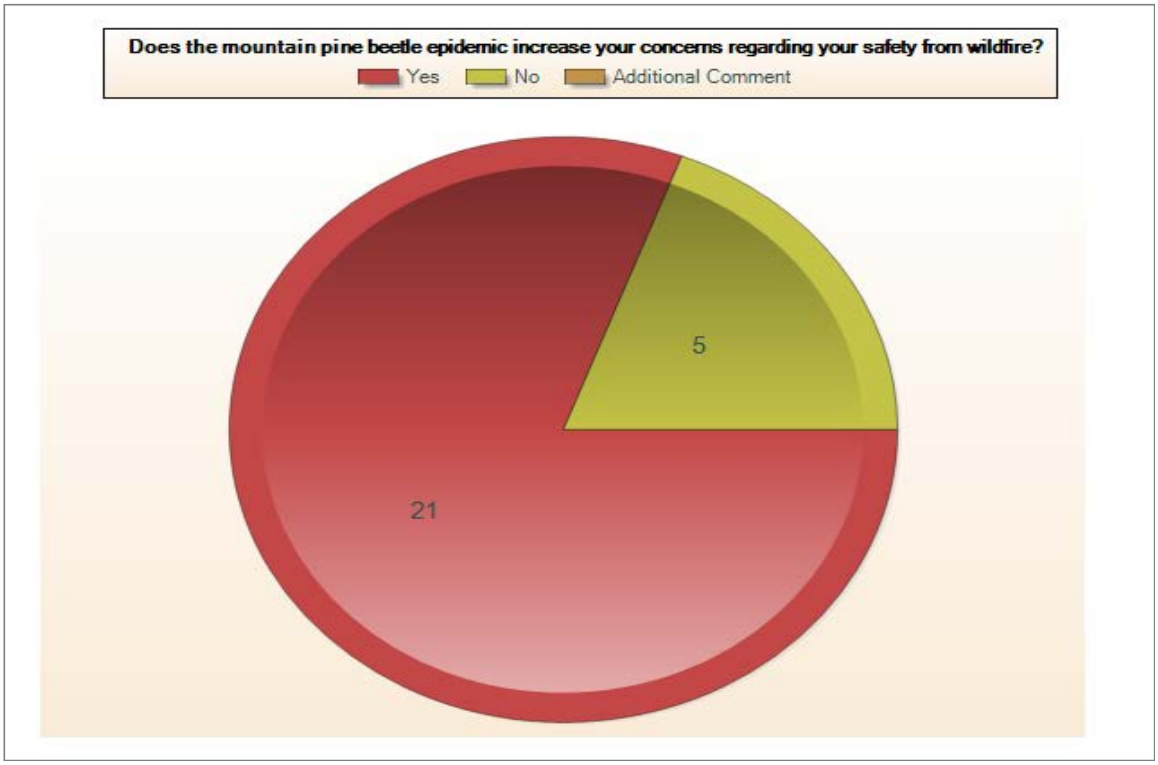


Project Collaboration

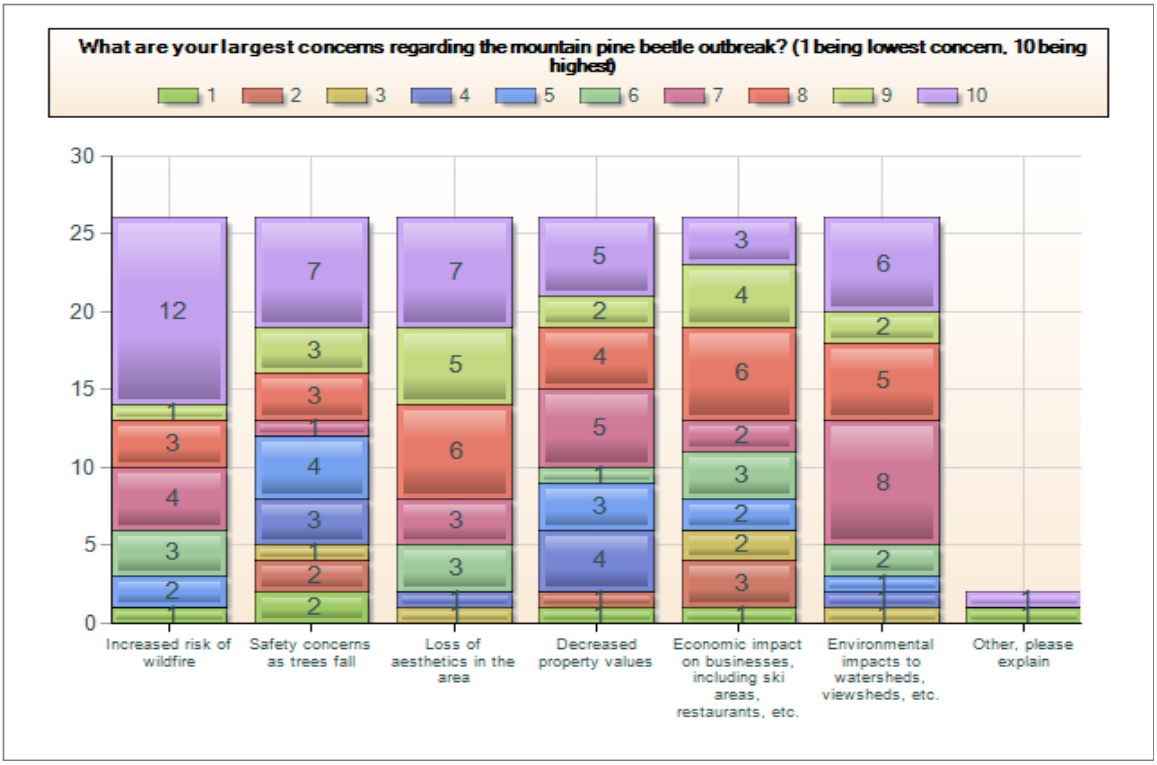


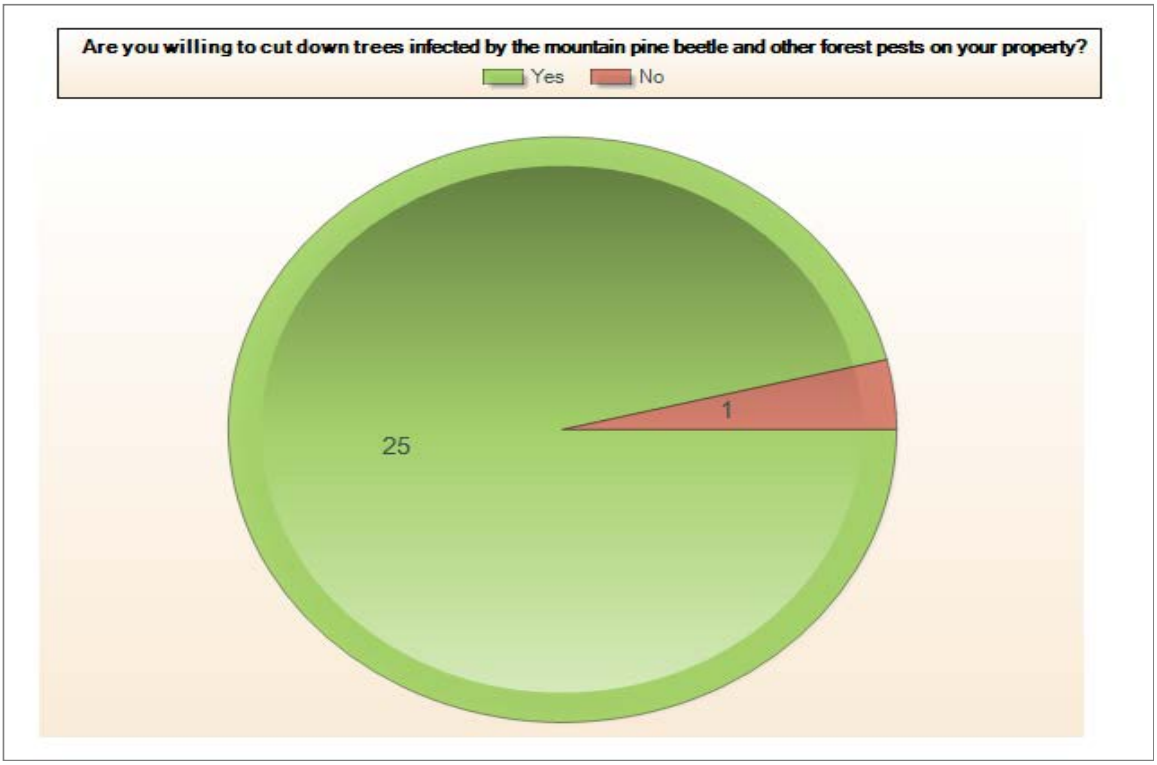


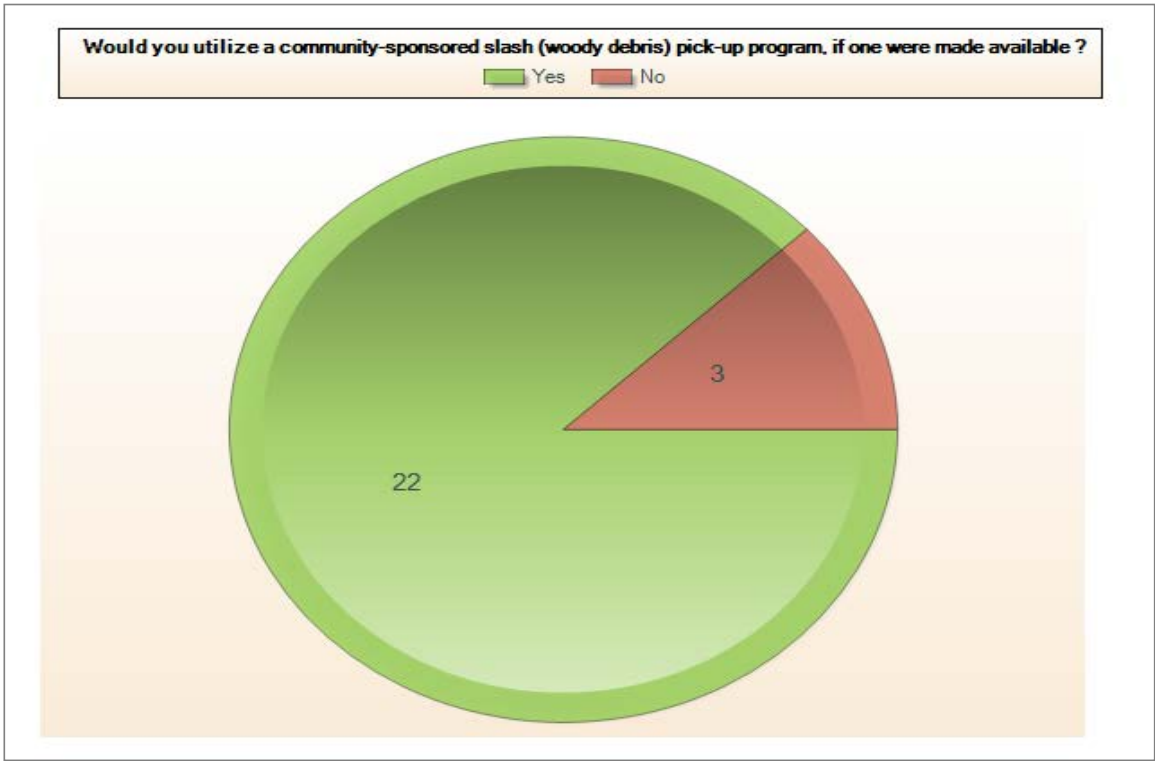

Under which of the following conditions would you be willing to do mitigation work on your property? (Please check all that apply.)
20
15
10
5
0
17
1
2
7
1
3
I would do mitigation work regardless of what anyone else does
Only if the work would be fully funded by government or private agencies
Only if the work would be cost shared with government or private agencies
Only if other landowners and managers, such as open space or local government agencies, are doing work on their land
Only if I can be convinced the work will improve the survivability of my home
Under no circumstances
Other, please specify

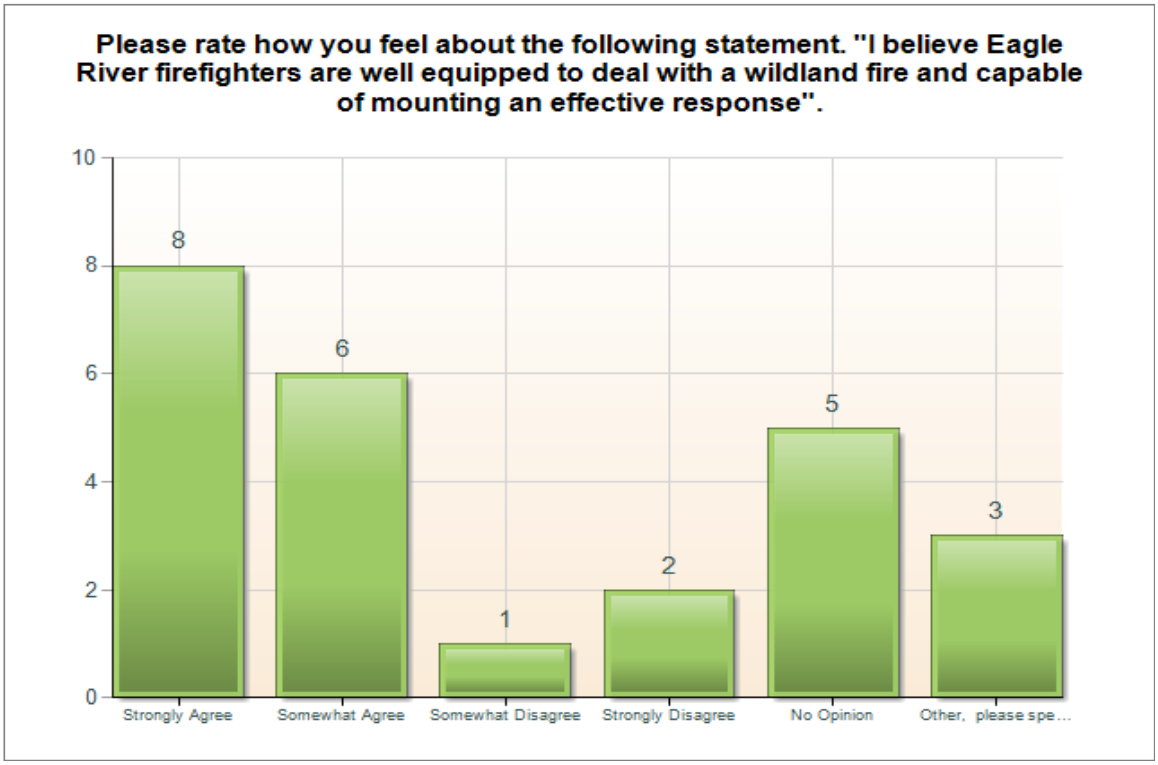

Does the mountain pine beetle epidemic increase your concerns regarding your safety from wildfire?
Yes
No
Additional Comment
5
21

Project Collaboration

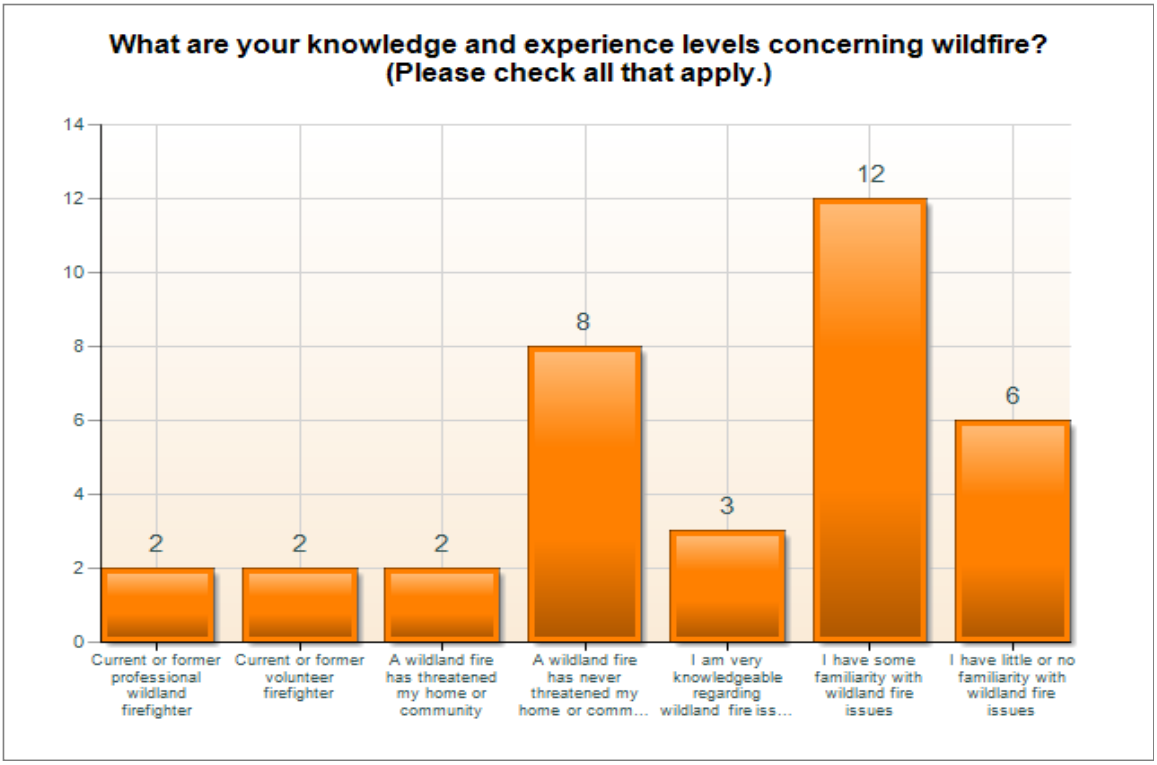


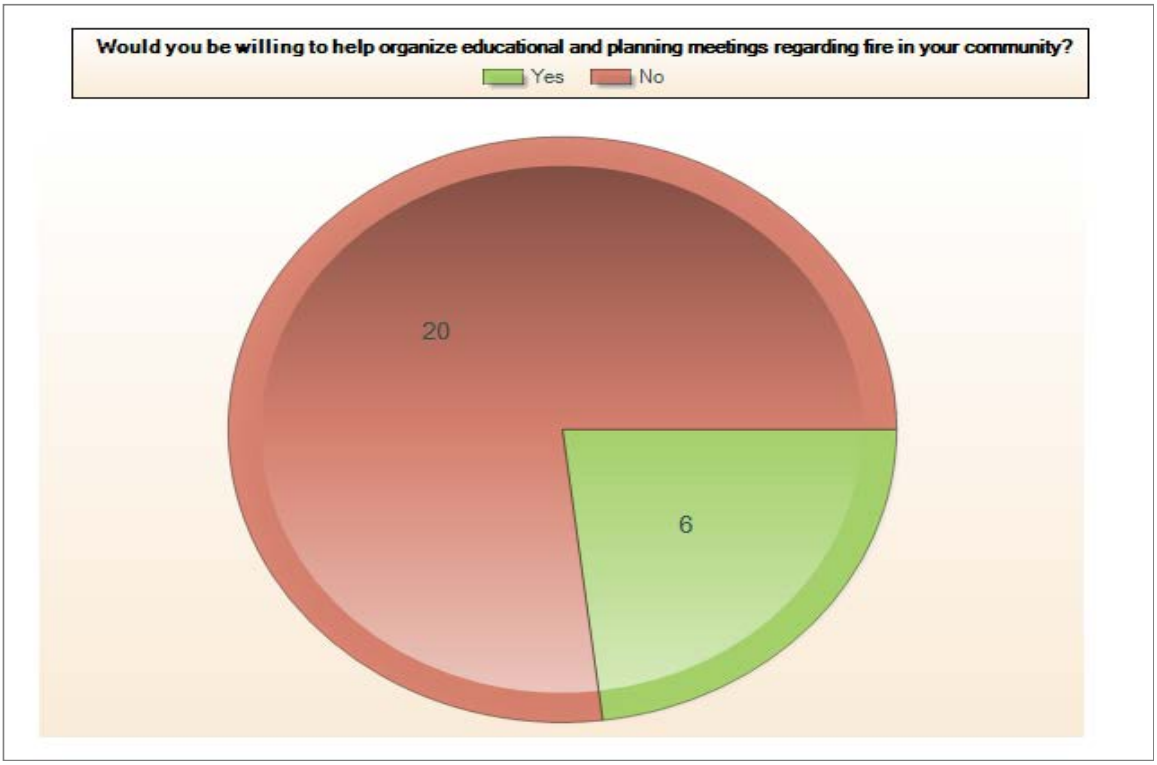


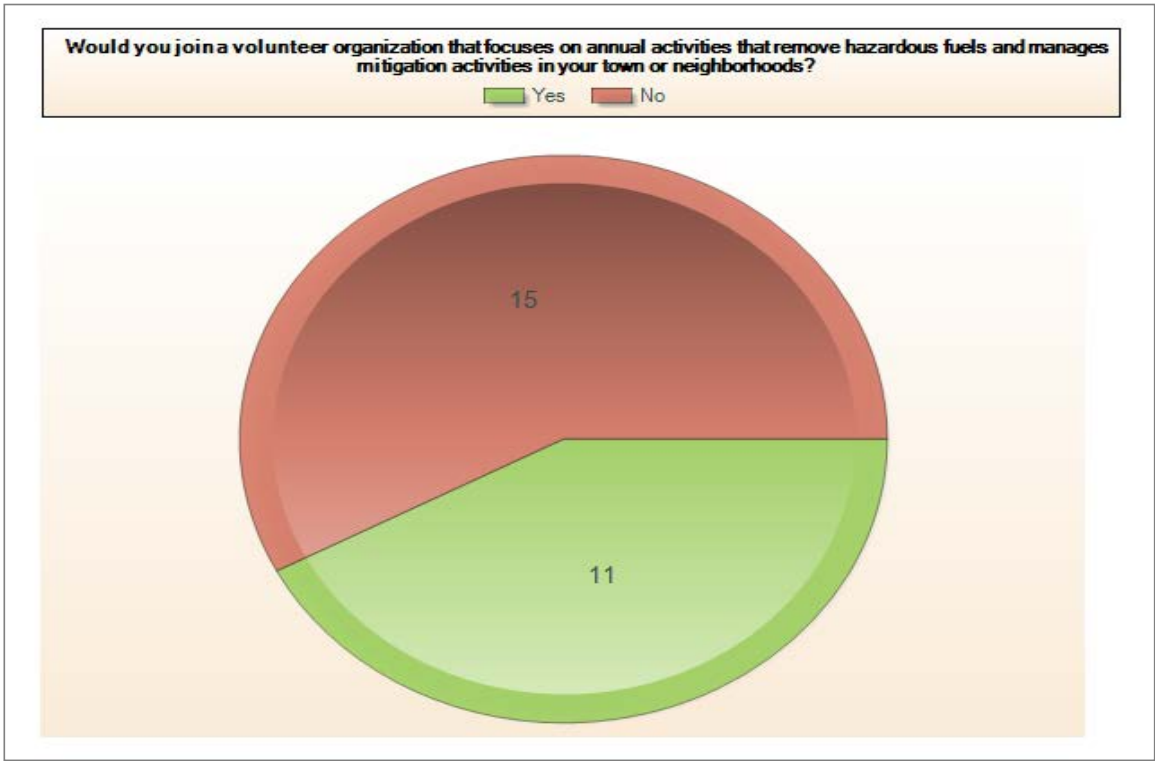

Would you utilize a community-sponsored slash (woody debris) pick-up program, if one were made available ?
Yes
No
3
22


Please rate how you feel about the following statement. "I believe Eagle River firefighters are well equipped to deal with a wildland fire and capable of mounting an effective response".
10
8
6
4
2
0
8
6
1
2
5
3
Strongly Agree
Somewhat Agree
Somewhat Disagree
Strongly Disagree
No Opinion
Other, please spe...

Project Collaboration






Would you join a volunteer organization that focuses on annual activities that remove hazardous fuels and manages mitigation activities in your town or neighborhoods?
Yes
No
15
11

Fire Behavior Technical Reference

FIRE BEHAVIOR POTENTIAL ANALYSIS METHODOLOGY

Purpose

The purpose of this document is to describe the methodology used to evaluate the threat represented by physical hazards such as fuels, weather, and topography to values at risk in the study area by modeling their effects on fire behavior potential. Figure 1 shows a flow chart of the fire behavior modeling process.

The fire behavior potential analysis graphically reports the following for the analysis area based on a set of inputs significant to fire behavior: probable range of spread rate; flame length; and crown fire potential. The model inputs include aspect, slope, elevation, canopy cover, fuel type, canopy bulk density, canopy base height, stand height, and climate data. The model outputs are determined using FlamMap, which combines surface-fire predictions with the potential for crown-fire development.[1]

1 Mark Finney, Stuart Brittain, and Rob Seli. The Joint Fire Sciences Program of the Rocky Mountain Research Station (USDA Forest Service, Missoula, Montana), the Bureau of Land Management and Systems for Environmental Management (Missoula, Montana).

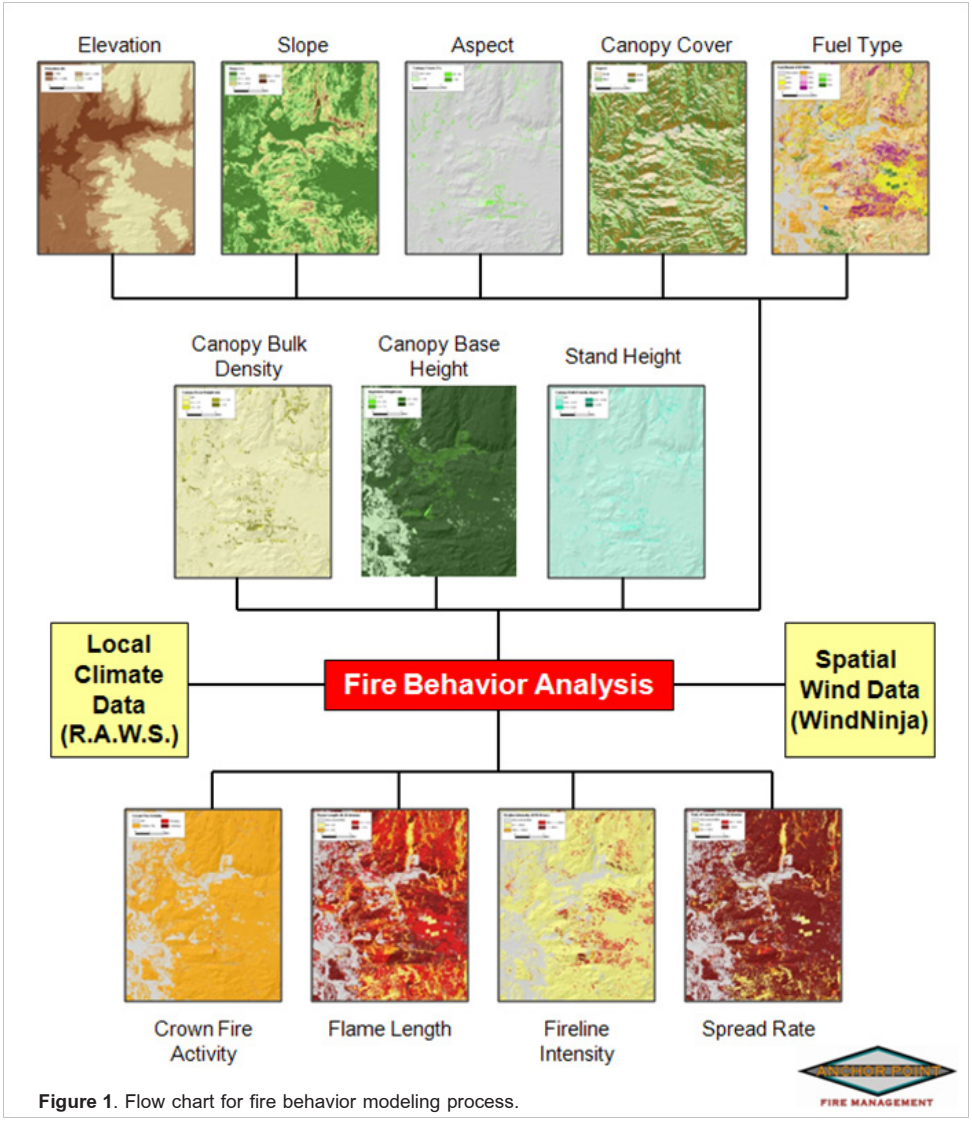


Figure 1. Flow chart for fire behavior modeling process.

Modeling Limitations and Discussion

This evaluation is a prediction of likely fire behavior given a standardized set of conditions and a single point source ignition at every point. It does not consider cumulative impacts of increased fire intensity over time and space. The model does not calculate the probability that a wildfire will occur. It assumes an ignition occurrence for every 30-meter x 30-meter cell. These calculations may be conservative (under-predict) compared to observed fire behavior.

Weather conditions are extremely variable and all possible combinations cannot be accounted for. These outputs are best used for preplanning and not as a stand-alone product for tactical planning. Whenever possible, fire behavior calculations should be done with actual weather observations during the fire. The most current Energy Release Component (ERC) values should also be calculated and distributed during the fire season to be used as a guideline for fire behavior potential.

Anchor Point's fire behavior modeling process for surface fire draws heavily from the BEHAVE fire behavior prediction and fuel modeling system.[2] BEHAVE is a nationally recognized set of calculations used to estimate a surface fire's intensity and rate of spread given certain topographical features, fuels, and weather conditions.

The BEHAVE modeling system has been used for a variety of applications, including predictions of current fires, prescribed fire planning, fuel hazard assessment, initial attack dispatch and fire-prevention planning and training. Predictions of wildland surface fire behavior are made for a single point in time and space, given user-defined fuels, weather, and topography. Requested values depend on the modeling choices made by the user.

Assumptions of BEHAVE:

- Fire is predicted at the flaming front. (Fire behavior is not modeled for the time after the flaming front of the fire has passed.)
- Fire is free burning (uncontrolled by suppression efforts).
- Behavior is heavily weighted toward the fine fuels (grasses and small-diameter wood).
- Fuels are continuous and uniform.
- Fires are considered to be surface fires. (Crown fire activity is modeled separately.)

BEHAVE makes calculations at a single point. In order to make calculations for an entire landscape (important for preplanning the effects of a wildfire at the community, district, or county scale), fire behavior is modeled using FlamMap, which models surface-fire predictions and the potential for crown-fire development.[3]

Assumptions of FlamMap:

- Each calculation in a given area is independent of calculations in any other area. Fire is not modeled dynamically across the landscape but statically as a series of individual calculations.
- Weather inputs such as wind and fuel moistures do not change over time.
- Fire behavior modeling calculations are performed in a series of uniform squares (or "pixels") across the landscape. These pixels determine the level of detail and nothing smaller than a pixel (30 meters x 30 meters in this case) is included in the modeling.

Crown-fire activity, rate of spread, flame length, and fireline intensity are derived from the fire behavior predictions. A limitation of FlamMap is that crown fire is not calculated for shrub models. The best method for determining the probability of crown fire in shrubs is to look at the flame length outputs and assume that if the flame length is greater than half the height of the plant, it will likely torch and/or crown. The following maps graphically display the outputs of FlamMap for both moderate and high weather conditions.

2 Patricia L. Andrews, producer and designer, Collin D. Bevins, programmer and designer, The Joint Fire Sciences Program of the Rocky Mountain Research Station (USDA Forest Service, Missoula, Montana) and Systems for Environmental Management (Missoula, Montana).

3 Van Wagner, C.E. 1977. "Conditions for the start and spread of a crown fire." Canadian Journal of Forest Research. 7: 23-24.

Fire Behavior Technical Reference

The outputs of the fire behavior models can be conceptually overlaid with the Community Wildfire Hazard Ratings (WHR) or other layers, such as recommendations, which are useful for prioritizing mitigation actions. The map below shows the recommendations overlaid on the fireline intensity. This allows for a general evaluation of the effects of the predicted fire behavior in areas of high hazard. However, remember that the minimum mapping unit used for fire behavior modeling is one acre; therefore, fine-scale fire behavior and effects are not considered in the model.

The fire behavior prediction maps are best used for preplanning and not as a stand-alone product for tactical planning. If this information is used for tactical planning, fire behavior calculations should be done with actual weather observations during the fire event. For greatest accuracy, the most current Energy Release Component (ERC) values should be calculated and distributed during the fire season to be used as a guideline for fire behavior potential.

FlamMap

Anchor Point used FlamMap to evaluate the potential fire conditions in the fire behavior study area. The study area, including the WUI boundary encompasses 151,256 acres (5.84 square miles).

The study area is broken down into grid cells 30 meters x 30 meters, for each of which fire behavior is predicted based on input fuel, weather, and topographic information. For the FlamMap run, data from the Land Fire v 1.10 were used for surface fuels, aspect, slope, elevation, canopy closure, canopy base height (CBH), and canopy bulk density (CBD).[4]

The final set of input data for the FlamMap model consist of reference weather and fuel moisture information summarized from a Remote Automated Weather Station (RAWS) site. See the section below for details on RAWS information.

REFERENCE WEATHER USED IN THE FIRE BEHAVIOR POTENTIAL EVALUATION

As stated above, climate and fuel moisture inputs for FlamMap were created by using data collected from a RAWS. The Dowd Junction RAWS was used to capture the climate for the project area because of its location and elevation. Although it is some distance from the study area, it has the longest weather data set of any of the RAWS in the area.

4 www.landfire.gov

Latitude (dd.ddddd)	**39.6333º N**
Longitude (dd.ddddd)	**106.4581º W**
Elevation (feet)	**8998**

Table C1. Dowd Junction RAWS (051901) information.

Weather observations for a 20-year period (1990-2010) were used. The moderate condition class (16th to 89th percentile, sorted by ERC) was calculated for each variable (1-hour, 10-hour, and 100-hour fuel moisture and 20-foot wind speed) using Fire Family Plus. This weather condition class most closely represents an average fire season day.

A second set of weather conditions was calculated to capture a high fire day (in terms of fuel moistures and wind speed). Values in the data set that were in the 90th percentile or greater class (sorted by ERC) were used to calculate the high condition class.

Preconditioning of fuel moistures was calculated for both weather scenarios. The models calculate separate dead fuel moistures for each landscape cell based on the topography and shading from forest canopy and clouds, as well as the recorded weather

(precipitation, high and low temperatures, and high and low relative humidity values) for the previous seven days. The dead fuel moistures that have been calculated by the start date and time of the analysis are used to determine the outputs in fire behavior models.

Moderate Weather Conditions

Variable	Value
20-foot wind speed upslope	20 mph*
Herbaceous fuel moisture**	48%
Woody fuel moisture**	102%
1-hr fuel moisture	6%
10-hr fuel moisture	8%
100-hr fuel moisture	12%

High Weather Conditions

Variable	Value
20-foot wind speed upslope	26 mph*
Herbaceous fuel moisture**	40%
Woody fuel moisture**	87%
1-hr fuel moisture	4%
10-hr fuel moisture	5%
100-hr fuel moisture	9%

Table C2. Input wind and fuel moisture parameters used for fire behavior models.
* Winds blowing uphill.
** Live fuel moistures are not calculated accurately from RAWS, so a standard moderate and high-fuel moisture set was used for live woody fuel moisture and live herbaceous fuel moisture. For standard values, see Scott and Burgen pg. 18 (2005).[1]

1 Scott, J.H. and R. Burgan. 2005. *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model*, United States Department of Agriculture Forest Service, RMRS-GTR-153.

Upslope Winds
Upslope winds were used instead of directional winds because aligning slope and wind will give the worst case results. Directional winds would favor one aspect over another and would show lower fire behavior on the leeward aspects. This is only the case under the given wind direction and would not account for other possible wind directions.

Dead Fuel Moisture
Dead fuel moisture responds solely to ambient environmental conditions and is critical in determining fire potential. Dead fuel moistures are classed by timelag. A fuel's timelag is proportional to its diameter and is loosely defined as the time it takes a fuel particle to reach two-thirds of its way to equilibrium with its local environment. Dead fuels in the National Fire Danger Rating System (NFDRS) fall into four classes: 1-hour, 10-hour, 100-hour, and 1,000-hour.[5]

Live Fuel Moisture
Live fuel moisture is the amount of water in a fuel, expressed as a percent of the oven-dry weight of that fuel. Fuel moisture between 300 percent and 30 percent is considered live. Anything below 30 percent is considered dead fuel. Fuel moistures can exceed 100 percent because the living cells can expand beyond their normal size to hold more water when available.

5 U.S. National Fire Danger Rating System Overview: INT-GTR-367 - FIRES: Fire Information Retrieval and Evaluation System - a Program for Fire Danger Rating Analysis.

Fire Behavior Technical Reference

FUEL MODELS AND FIRE BEHAVIOR

In the context of fire behavior modeling, "fuel models" are a set of numbers that describe fuels in terms that the fire behavior modeling equations can use directly. There are seven characteristics used to categorize fuel models:

- Fuel loading
- Size and shape
- Compactness
- Horizontal continuity
- Vertical arrangement
- Moisture content
- Chemical content

Each of the major fuel types present in the study area is described below. Unless otherwise noted, fuel model descriptions are taken from Scott and Burgan's *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model*, a national standard guide to fuel modeling.[6] **For specific information about the fuel models' effects on the fire behavior, see the main report.**

In *Standard Fire Behavior Fuel Models*, Scott and Burgan describe 40 fuel models in the following six groups: non-burnable (NB), grass (GR), grass/shrub (GS), shrub (SH), timber understory (TU) and timber litter (TL). The study area is represented primarily by the following fuel models (FM):

6 Scott, J.H. and R. Burgan. 2005. Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model, United States Department of Agriculture Forest Service, RMRS-GTR-153.

Grass Fuel Models	Shrub Fuel Models	Timber Fuel Models	Non-Burnable
FM101 (GR1)	FM141 (SH1)*	FM161 (TU1)	NB1 (91) Urban/Developed*
FM102 (GR2)*	FM147 (SH7)*	FM165 (TU5)	NB2 (92) Snow/Ice
FM121 (GS1)*		FM183 (TL3)	NB3 (93) Agricultural*
FM122 (GS2)			NB8 (98) Open Water*
			NB9 (99) Bare Ground

Table C3. Fuel models found in the study area.
* Some fuel models may exist but not in quantities (less than 5 percent on the landscape) sufficient to significantly influence fire behavior across the landscape.

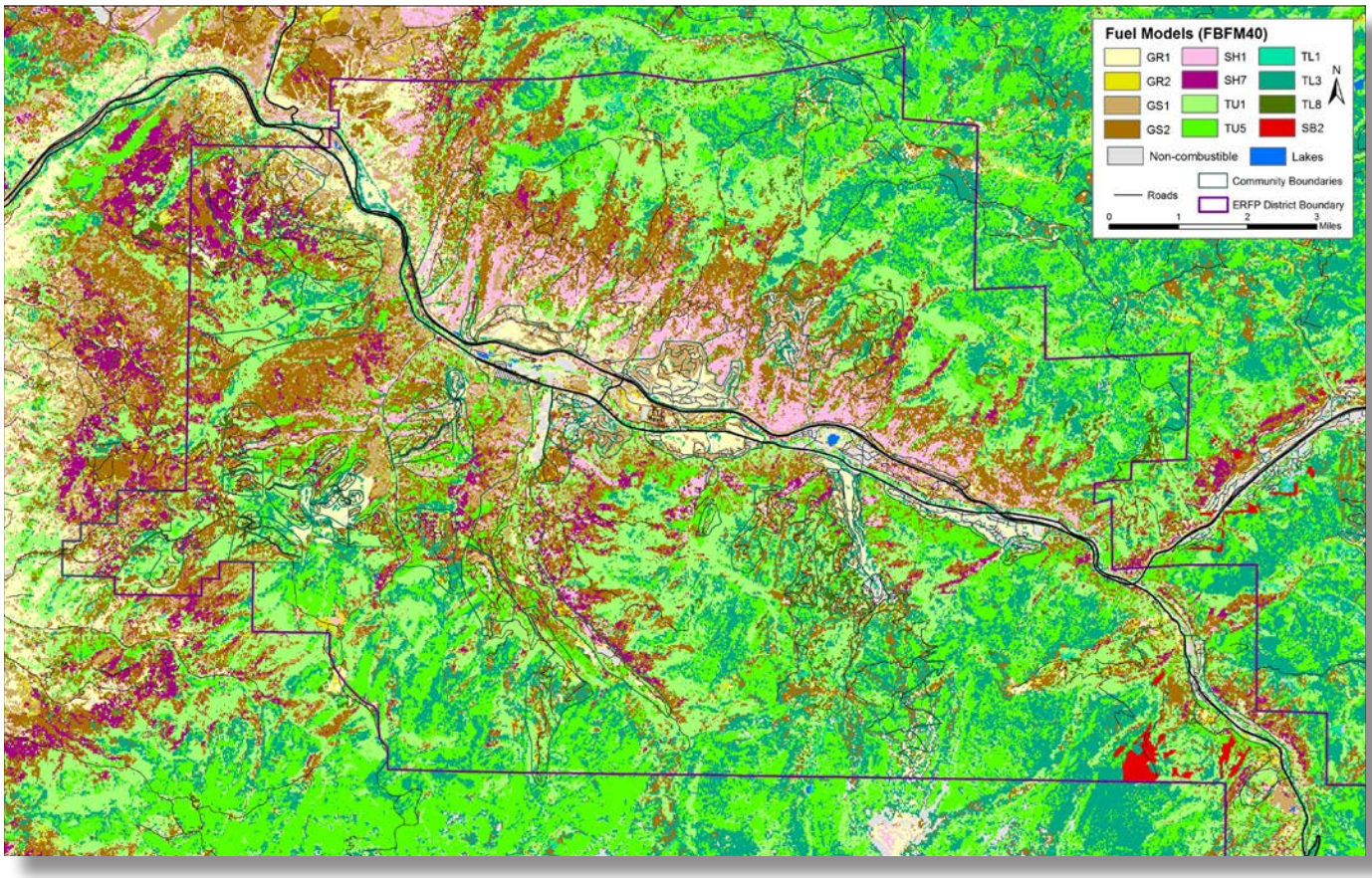


Figure C2. Fuels found in the ERFPD district.

FUEL GROUP DESCRIPTIONS AND COMPARISONS

Grass Fuel (GR) Type Models

The primary carrier of fire in the GR fuel models is grass. Grass fuels can vary from heavily grazed grass stubble or sparse natural grass to dense grass more than six feet tall. Fire behavior varies from moderate spread rate and low flame length in the sparse grass to extreme spread rate and flame length in the tall grass models.

All GR fuel models are dynamic, meaning that their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong.

Grass-Shrub (GS) Fuel Type Models

The primary carrier of fire in the GS fuel models is grass and shrubs combined; both components are important in determining fire behavior.

All GS fuel models are dynamic, meaning that their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong and depends on the relative amount of grass and shrub load in the fuel model.

Fire Behavior Technical Reference

Shrub (SH) Fuel Type Models
The primary carrier of fire in the SH fuel models is live and dead shrub twigs and foliage in combination with dead and down shrub litter. A small amount of herbaceous fuel may be present, especially in SH1 and SH9, which are dynamic models (their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content). The effect of live herbaceous moisture content on spread rate and flame length can be strong in those dynamic SH models.

Timber-Understory (TU) Fuel Type Models
The primary carrier of fire in the TU fuel models is forest litter in combination with herbaceous or shrub fuels. TU1 and TU3 contain live herbaceous load and are dynamic, meaning that their live herbaceous fuel load is allocated between live and dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong and depends on the relative amount of grass and shrub load in the fuel model.

Timber Litter (TL) Fuel Type Models
The primary carrier of fire in the TL fuel models is dead and down woody fuel. Live fuel, if present, has little effect on fire behavior.

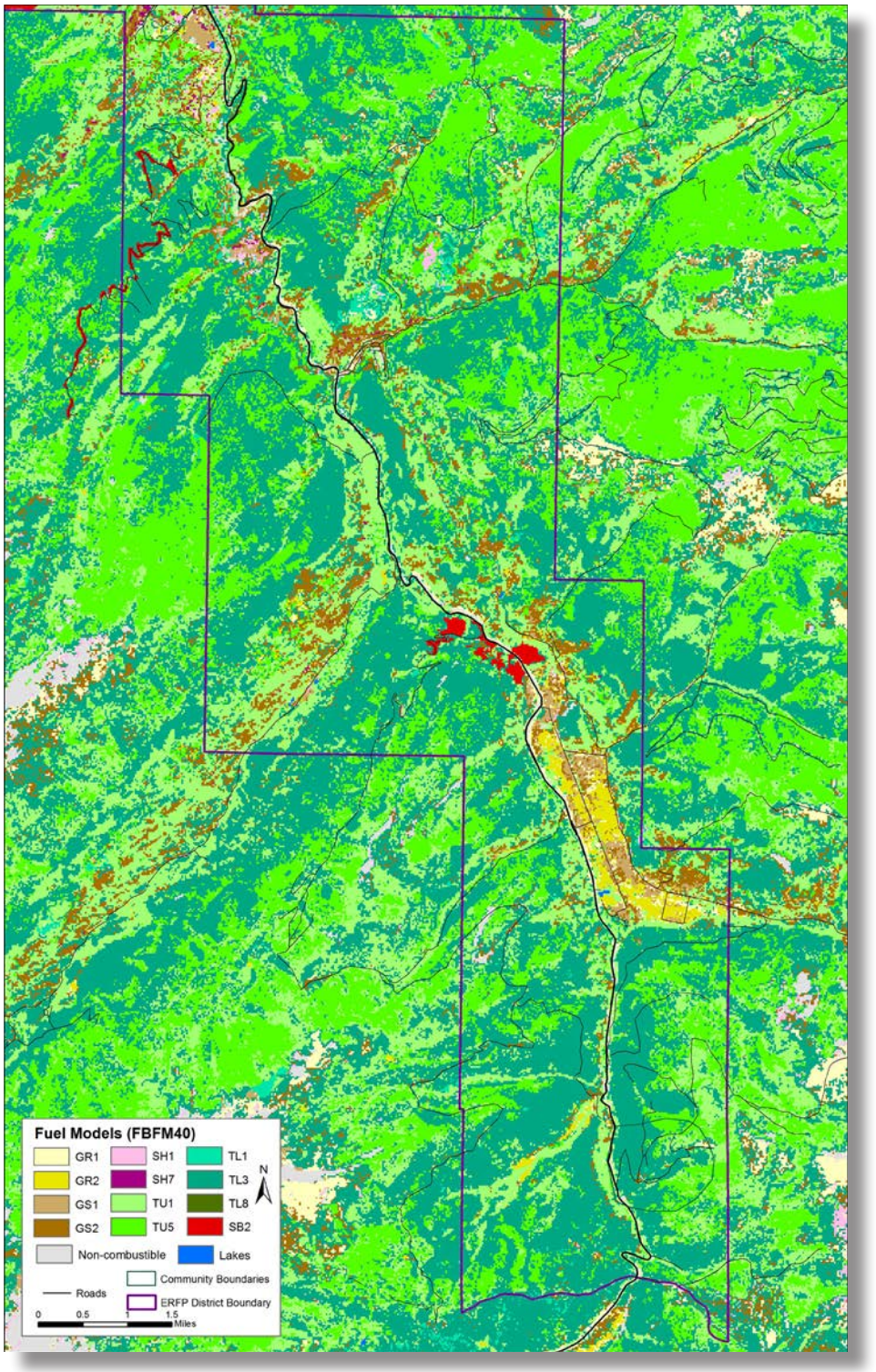
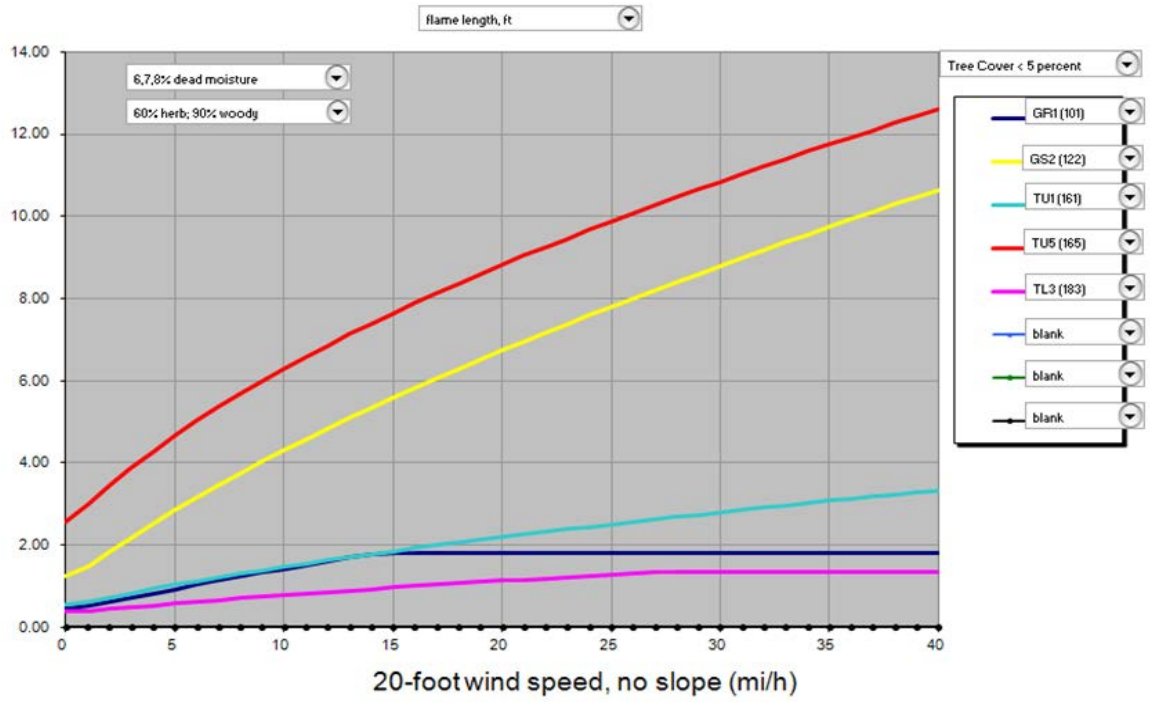


Figure C3. Fuels found in the ERFPD district.

COMPARISON OF FUEL MODELS IN THE STUDY AREA

The following graphs (Figures 4 and 5) show the predicted fire behavior according to fuel type given the same weather and fuel moisture inputs.



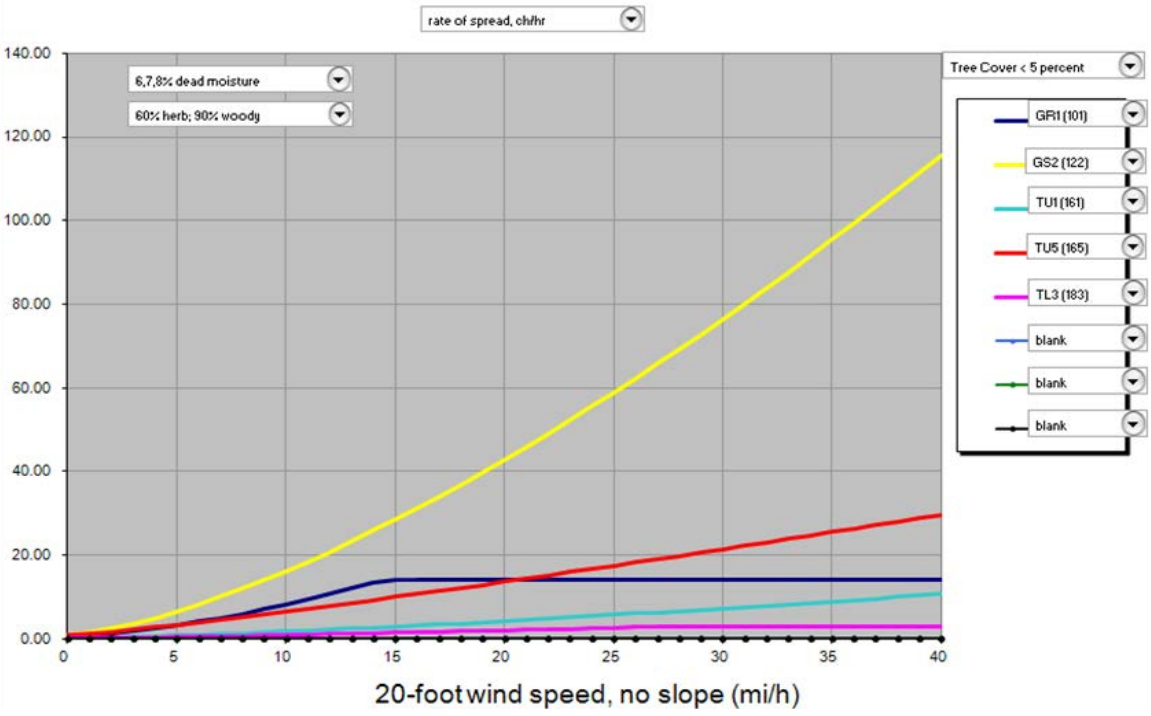


Figure C4 (Top). Flame length outputs for primary fuel models.

Figure C5 (Bottom). Rate of spread outputs for primary fuel models.

Fire Behavior Technical Reference

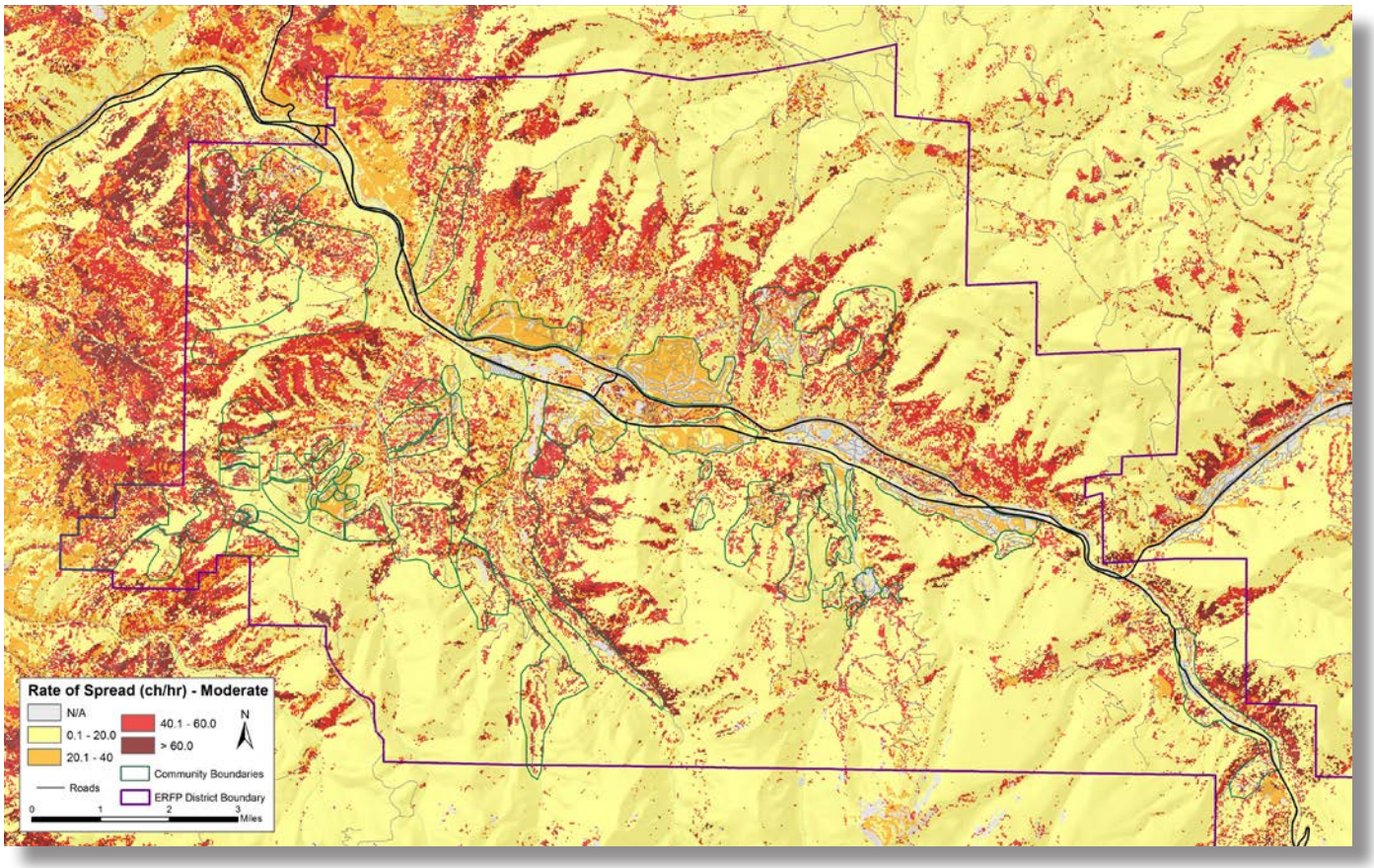


Figure C6. Rate of spread given moderate conditions.

FIRE BEHAVIOR OUTPUTS

Rate of Spread

Spread rate values are generated by FlamMap and are classified into four categories based on standard ranges: 0-20 chains per hour (ch/h); 20.1-40 ch/h; 40.1-60 ch/h; and greater than 60 ch/h. A chain is a logging measurement that is equal to 66 feet. One mile equals 80 chains, and one ch/h equals approximately one foot/minute or 80 chains per hour equals one mile per hour.

Rate of spread in chains/hour
(1 chain=66') (80 chains/hr = 1 MPH)

Note: A high rate of spread is not necessarily severe. Fire will move very quickly across grass fields but will not burn very hot and does not cause any major damage to the soil.

RATE OF SPREAD

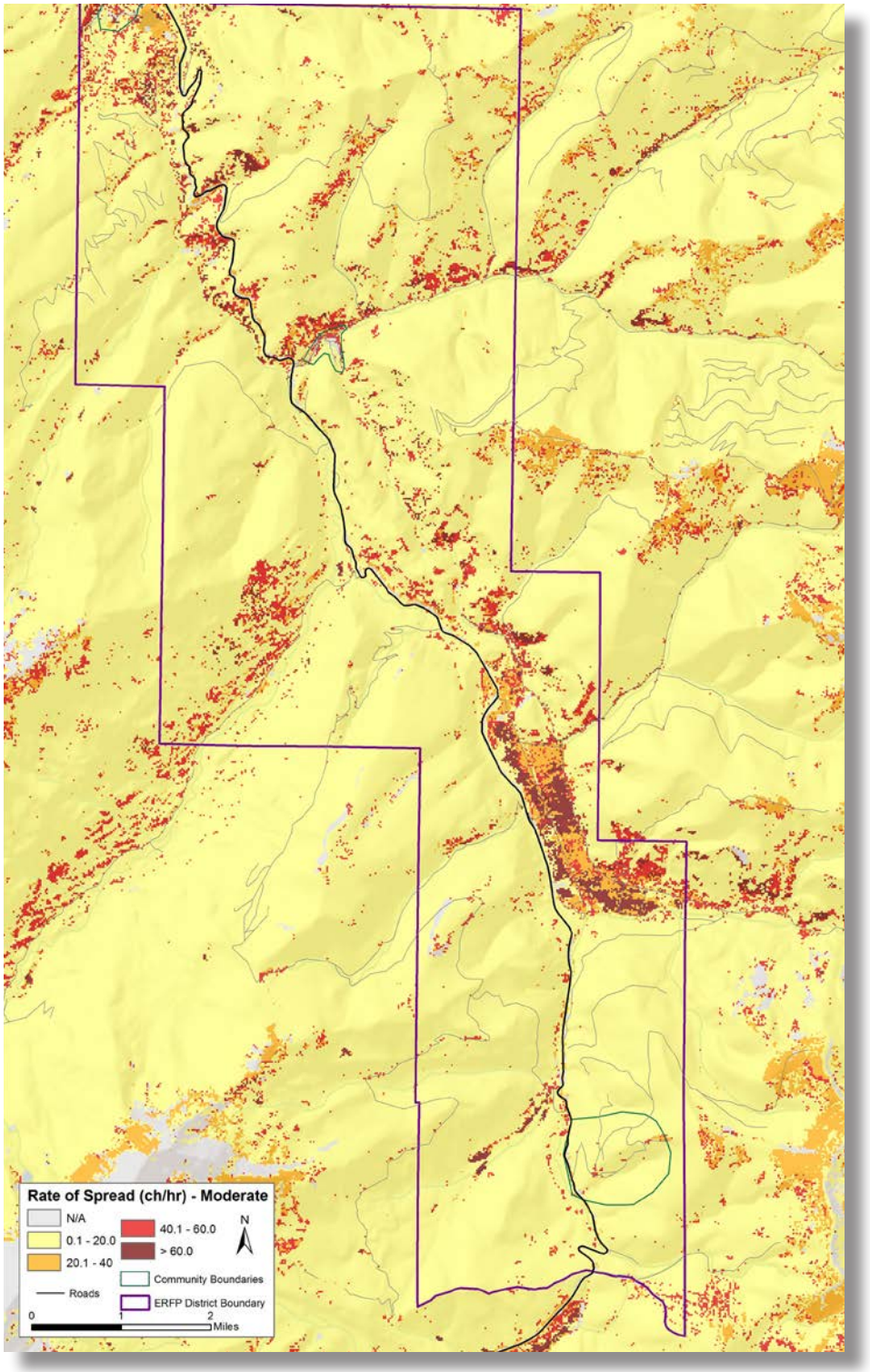


Figure C7. Predicted rate of spread under moderate weather conditions.

Fire Behavior Technical Reference

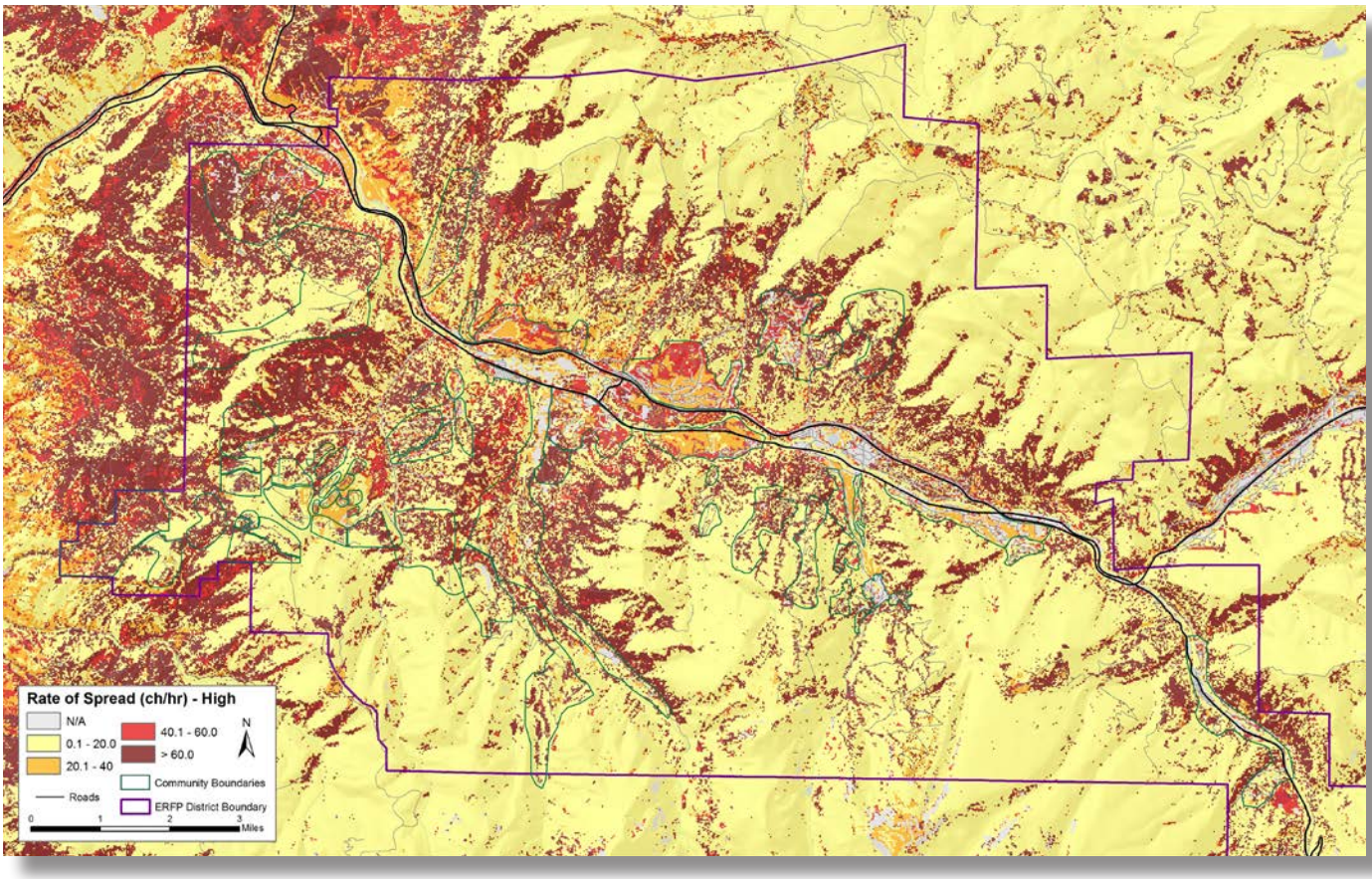


Figure C8. Predicted rate of spread under high weather conditions.

RATE OF SPREAD

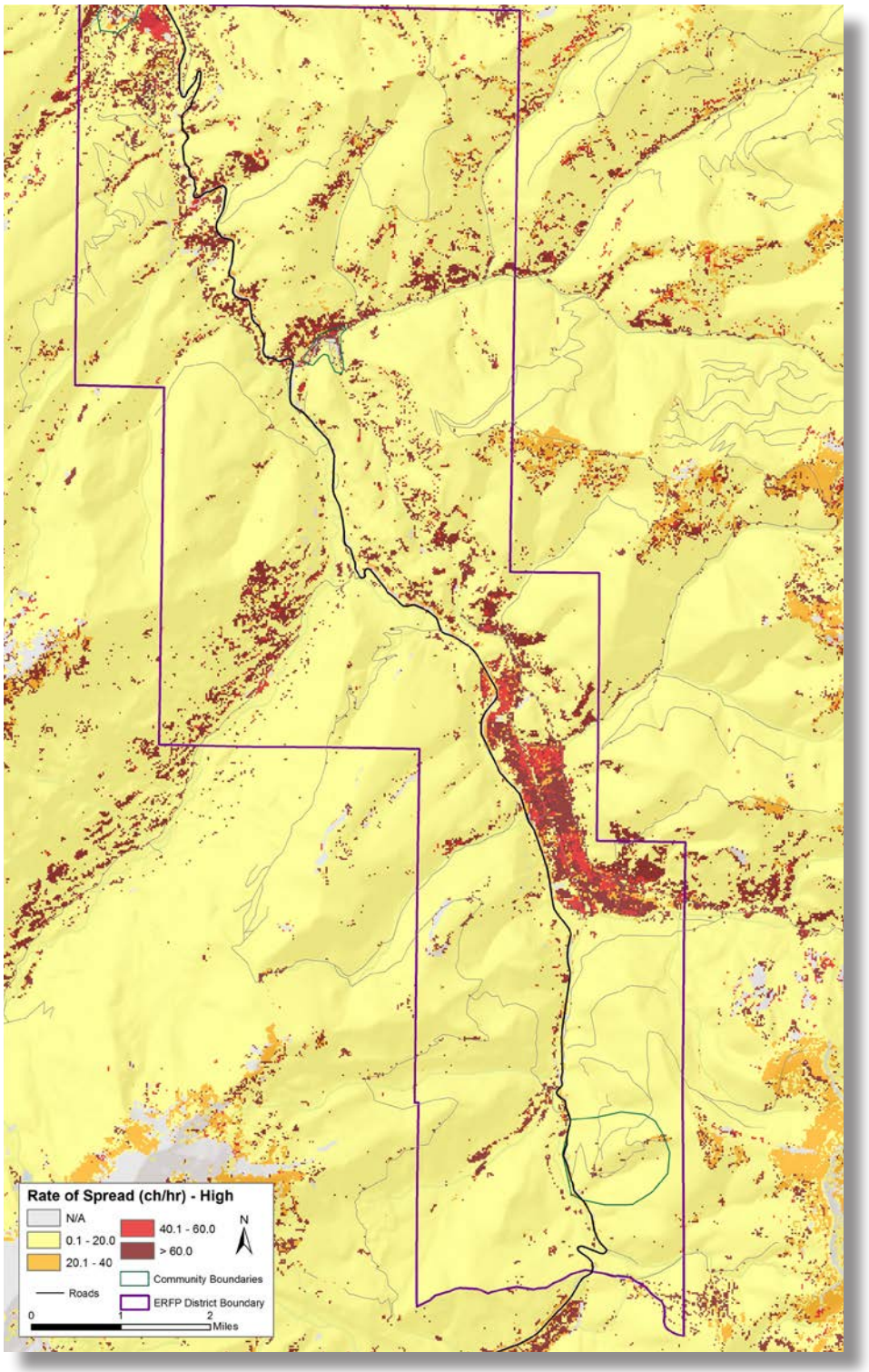


Figure C9. Predicted rate of spread under high weather conditions.

Fire Behavior Technical Reference

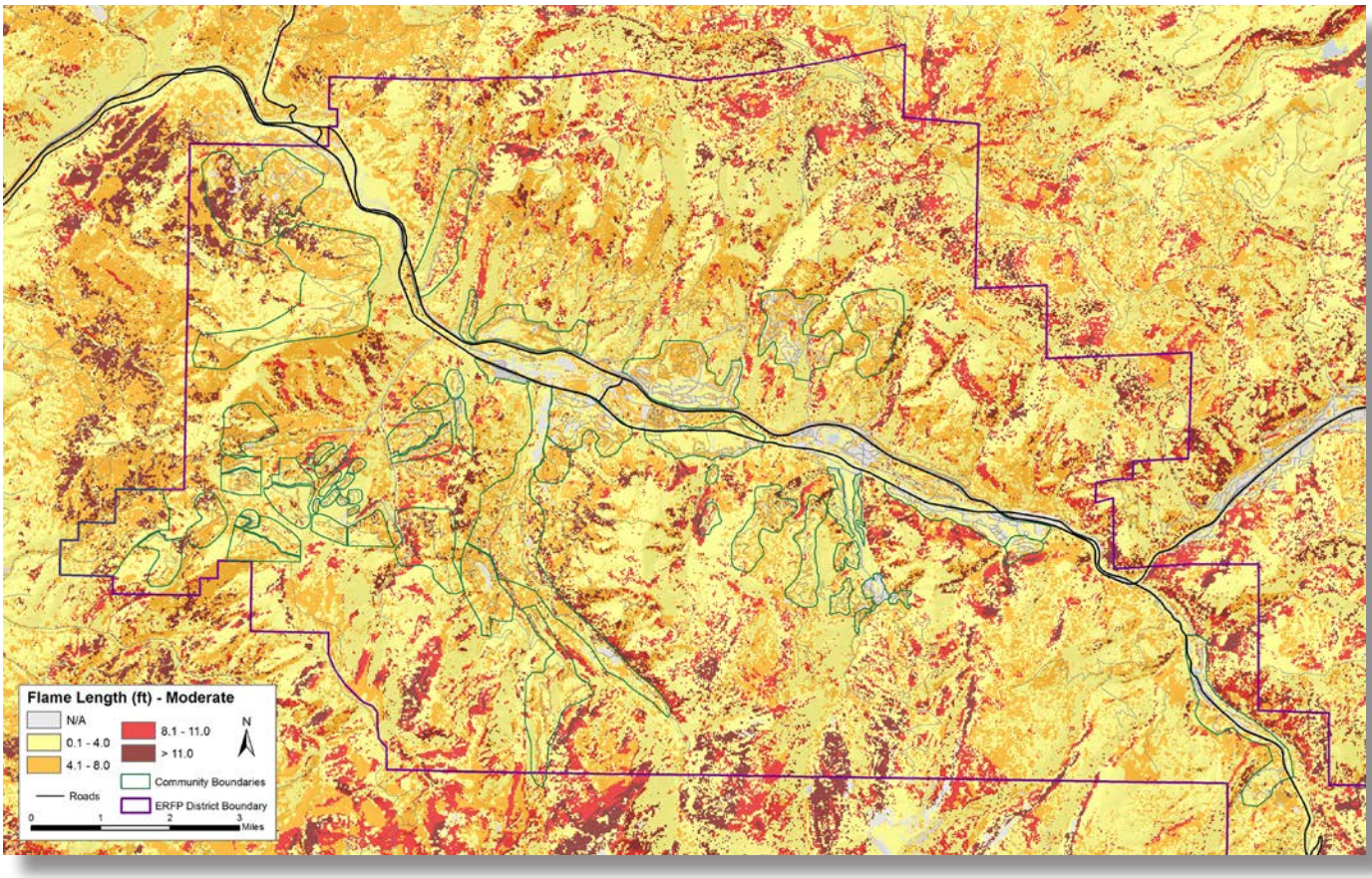


Figure C10. Predicted flame lengths under moderate weather conditions.

FLAME LENGTH

Flame length values are generated by the FlamMap model and classified into four categories based on standard ranges: 0.1-4.0 feet; 4.1-8.0 feet; 8.1-11.0 feet; and greater than 11.0 feet.

The legend boxes display flame length in ranges that are meaningful to firefighters. The flame lengths are a direct measure of how intense the fire is burning. Flame lengths of four feet and less are deemed low enough intensity to be suitable for direct attack by hand crews and therefore represent the best chances of direct extinguishment and control. Flame lengths of less than eight feet are suitable for direct attack by equipment such as bulldozers and tractor plows. Flame lengths of eight to 11 feet are usually attacked by indirect methods and aircraft. In conditions where flame lengths exceed 11 feet, the most effective tactics are fuel consumption ahead of the fire by burnouts or mechanical methods.

FLAME LENGTH

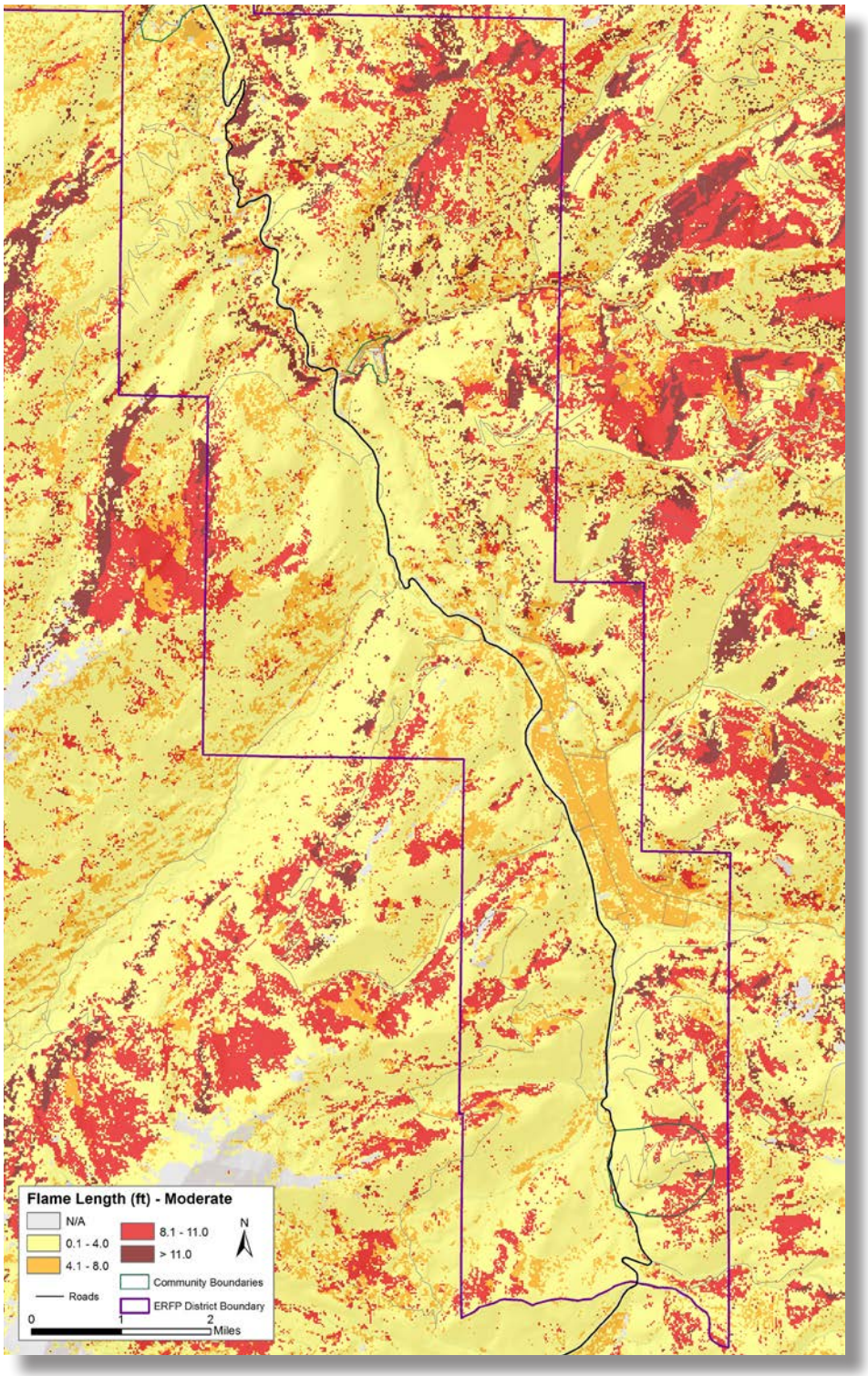


Figure C11. Predicted flame lengths under moderate weather conditions.

Fire Behavior Technical Reference

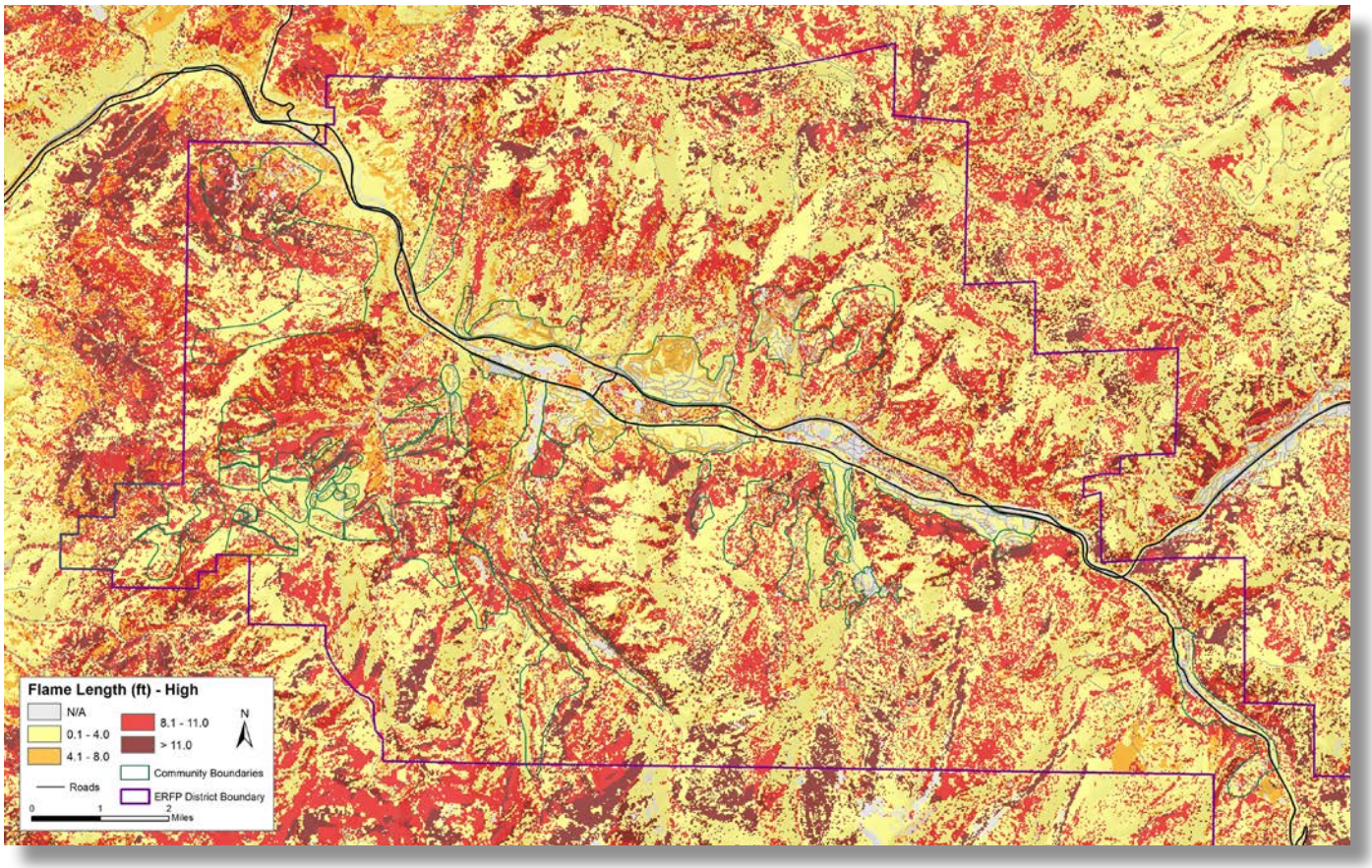


Figure C12. Predicted flame lengths under high weather conditions.

FLAME LENGTH

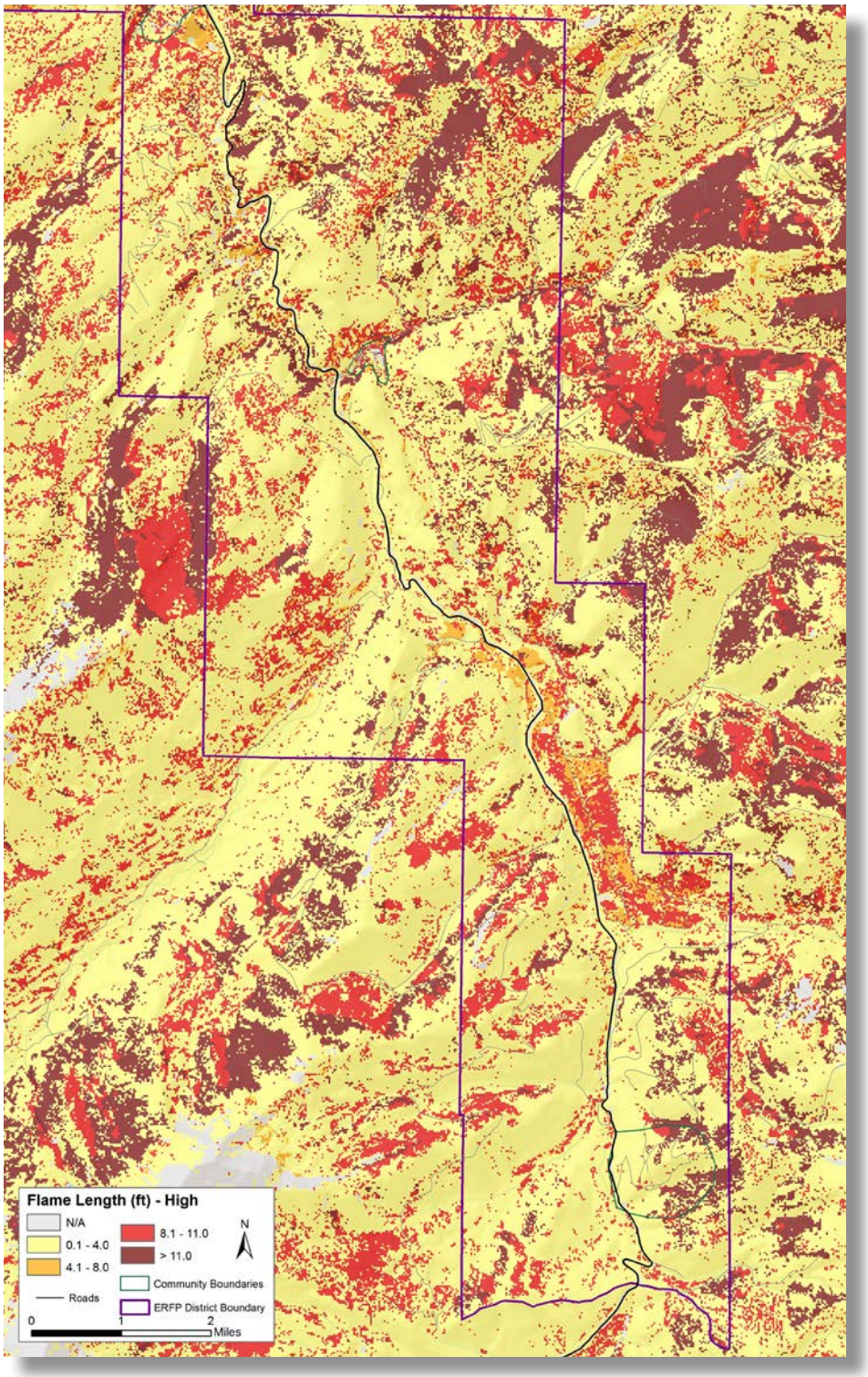


Figure C13. Predicted flame lengths under high weather conditions.

Fire Behavior Technical Reference

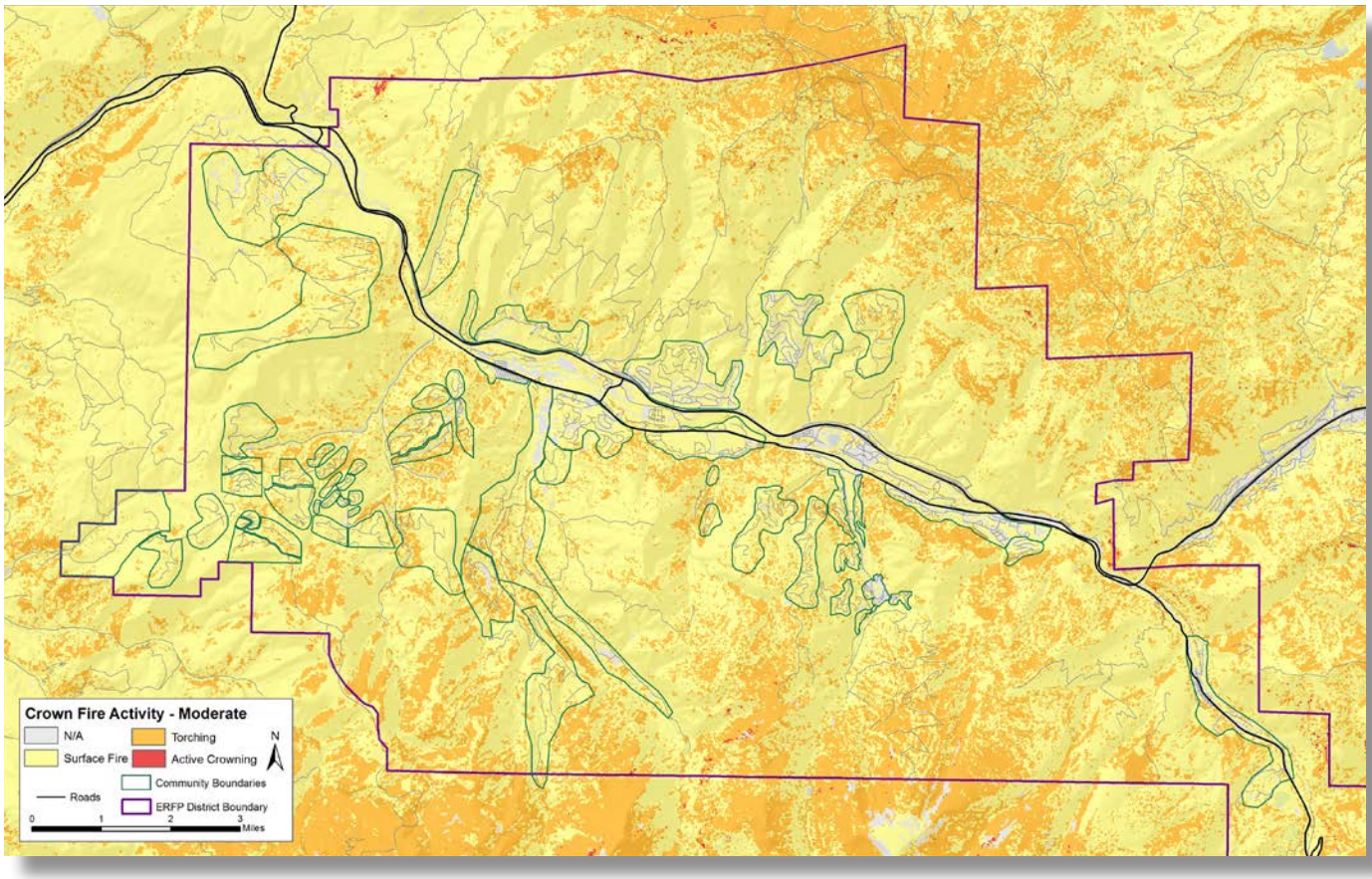


Figure C14. Predicted crown fire activity under moderate weather conditions.

CROWN FIRE

Crown fire activity values are generated by the FlamMap model and classified into four categories based on standard ranges: active; torching; surface; and not applicable. In the surface fire category, little or no tree torching will be expected. During passive crown fire activity, isolated torching of trees or groups of trees will be observed and canopy runs will be limited to short distances. During active crown fire activity, sustained runs through the canopy will be observed that may be independent of surface fire activity.

CROWN FIRE

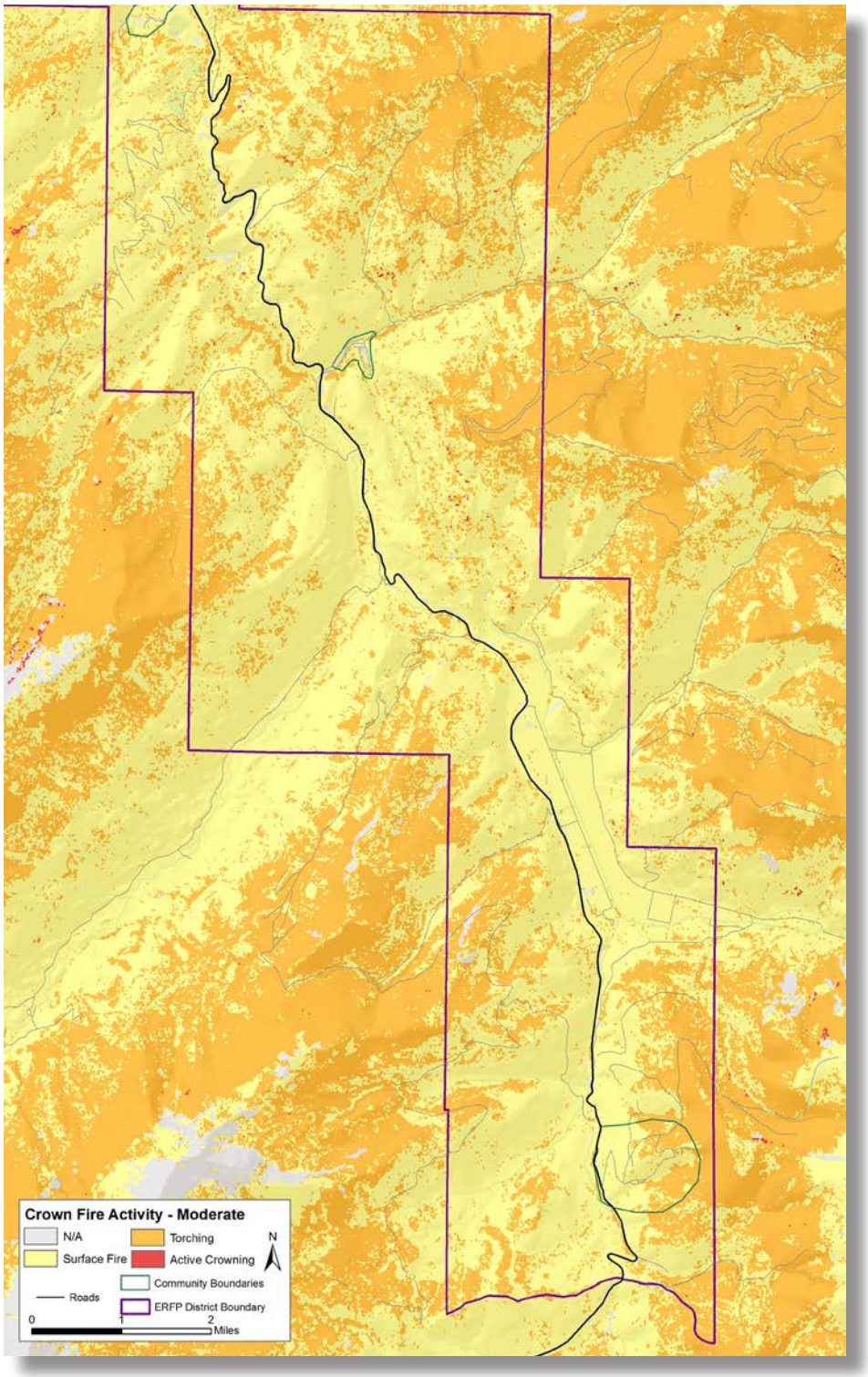


Figure C15. Predicted crown fire activity under moderate weather conditions.

Fire Behavior Technical Reference

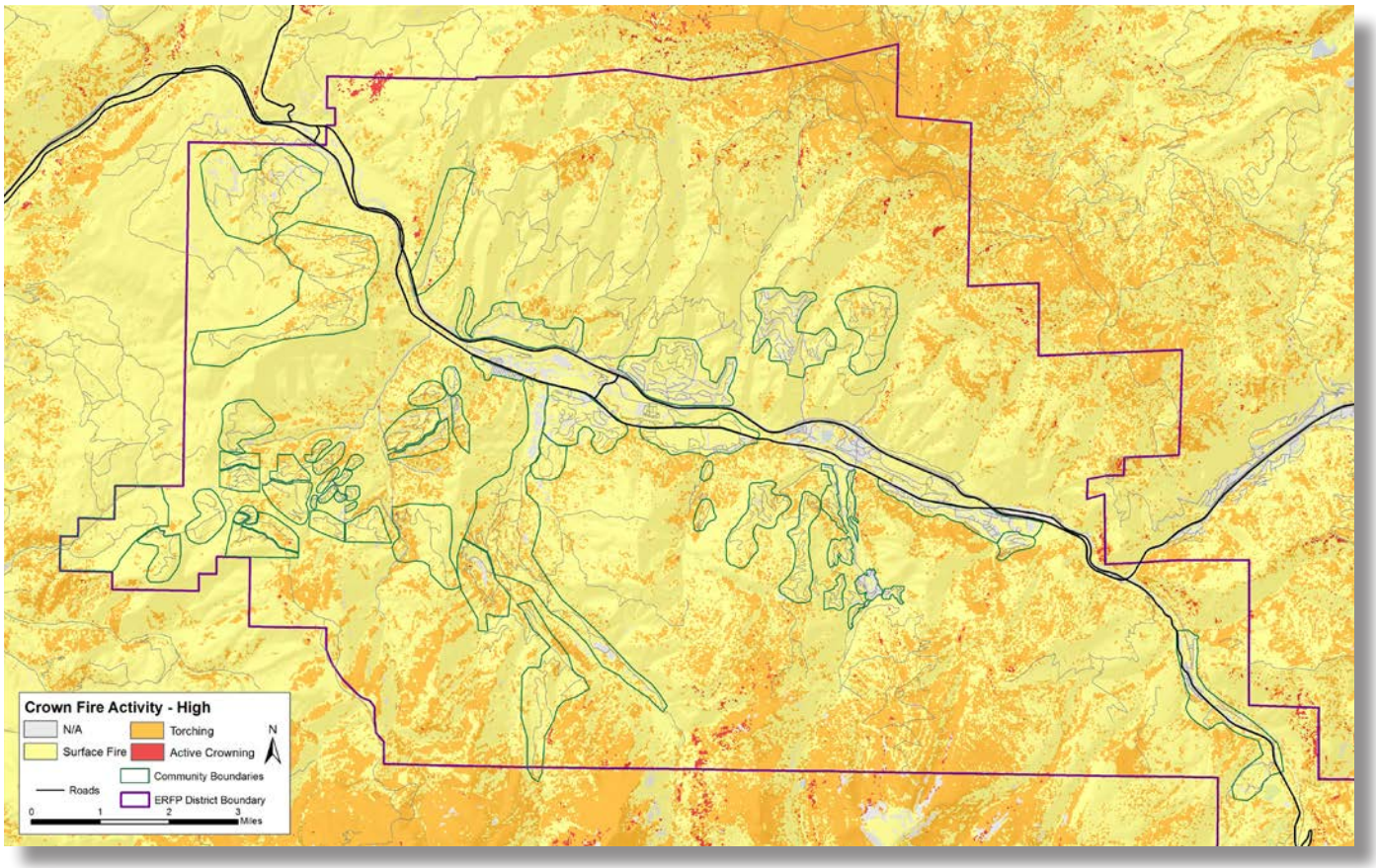


Figure C14. Predicted crown fire activity under high weather conditions.

CROWN FIRE

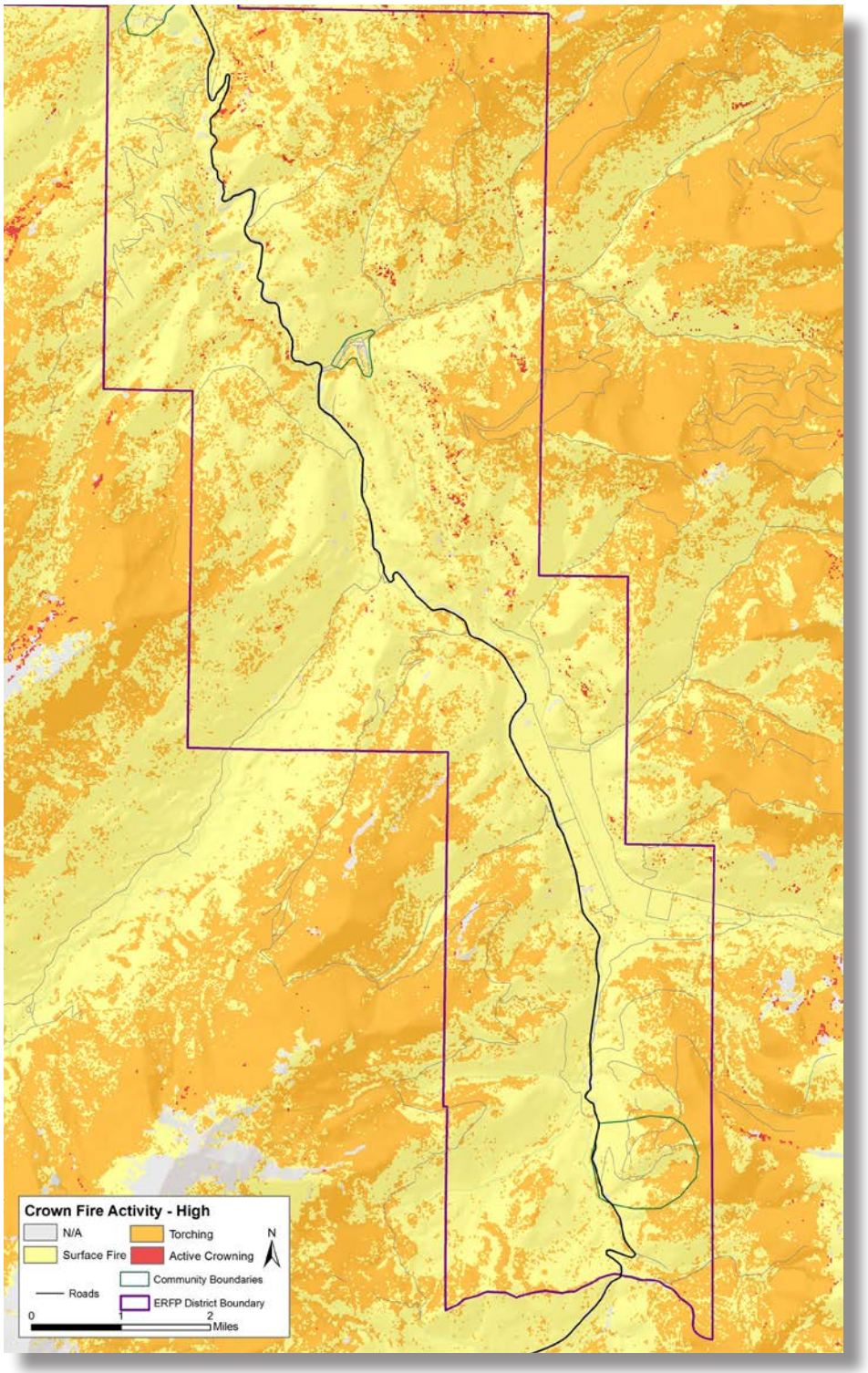


Figure C15. Predicted crown fire activity under high weather conditions.

Guiding Documents

THE NATIONAL FIRE PLAN AND THE HEALTHY FORESTS RESTORATION ACT

In 2000, more than eight million acres burned across the United States, marking one of the most devastating wildfire seasons in American history. One high-profile incident, the Cerro Grande fire at Los Alamos, NM, destroyed more than 235 structures and threatened the Department of Energy's nuclear research facility.

Two reports addressing federal wildland fire management were initiated after the 2000 fire season. The first report, prepared by a federal interagency group, was titled "Review and Update of the 1995 Federal Wildland Fire Management Policy" (2001). This report concluded, among other points, that the condition of America's forests had continued to deteriorate.

The second report, titled "Managing the Impacts of Wildfire on Communities and the Environment: A Report to the President in Response to the Wildfires of 2000," was issued by the Bureau of Land Management (BLM) and the United States Department of Agriculture Forest Service (USFS). It became known as the National Fire Plan (NFP). This report, and the ensuing Congressional appropriations, ultimately required actions to:

- Respond to severe fires
- Reduce the impacts of fire on rural communities and the environment
- Ensure sufficient firefighting resources

Congress increased its specific appropriations to accomplish these goals. In 2002 another severe season occurred: more than 1,200 homes were destroyed and over seven million acres burned. In response to public pressure, Congress and the Bush administration continued to designate funds specifically for actionable items such as preparedness and suppression. That same year, the Bush administration announced the Healthy Forests Initiative, which enhanced measures to restore forest and rangeland health and reduce the risk of catastrophic wildfires. In 2003, the Healthy Forests Restoration Act was signed into law.

Through this piece of legislation, Congress continues to appropriate specific funding to address five main sub-categories through the NFP: preparedness, suppression, reduction of hazardous fuels, burned-area rehabilitation, and state and local assistance to firefighters. The general concepts of the NFP blend well with the established need for community wildfire protection in the study area. The spirit of the HFRA and NFP is reflected in the Kremmling CWPP.

This CWPP strives to meet the requirements of HFRA by:

- Identifying and prioritizing fuels reduction opportunities across the landscape
- Addressing structural ignitability
- Assessing community fire suppression capabilities
- Collaborating with stakeholders

CSFS MINIMUM STANDARDS FOR CWPPS[1]

1. Participants
   - Local government, local fire authority, and a representative of the Colorado State Forest Service must agree on the CWPP.
   - In addition to the above, the core planning team should include relevant federal land management agency representatives and community members.
   - Input from interested non-governmental stakeholders must be sought as community protection priorities are being set and treatment areas and methods are planned.

1 Colorado State Forest Service. "Preparing a Community Wildfire Protection Plan: A Guide for Wildland Urban Interface Communities."

2. Plan Components
   - Community Wildfire Protection Plans must include the following components:
     - A definition of the community's wildland-urban interface (WUI), preferably outlined on a map with an accompanying narrative.
     - A discussion of the community's preparedness to respond to wildland fire.
     - A community risk analysis that considers, at a minimum, fuel hazards, risk of wildfire occurrence and community values to be protected – both in the immediate vicinity and the surrounding zone where potential fire spread poses a realistic threat.
     - Identification of fuels treatment priorities, including locations on the grounds and preferred methods of treatment.
     - Recommendations regarding ways to reduce structural ignitability.
     - An implementation plan.

3. Level of Specificity
   - A CWPP may be developed for any level of "community," (e.g., homeowner's association, mountain town, county, metropolitan city, or fire protection district).
   - Risks must be assessed, and treatment priorities implemented, that will protect the community.
   - The plan must be diversely collaborative.
   - County level plans can be used as an umbrella for plans in smaller communities, but should not be considered a substitute. A county plan must identify specific projects and implementation methods and must reflect collaborative input from a variety of stakeholders.

4. Adapting Existing Plans and Combining Related Plans
   - If a community has an existing plan that already meets the majority of the CWPP criteria, it is preferable to work with the community to adapt that plan to meet the remainder of the criteria. However, plan adaptations must be collaborative as described in (1) above and include stakeholder representation. This is particularly important if the adaptation involves establishing fuels treatment priorities. Communities are encouraged to combine CWPPs with related documents such as FEMA All-Hazard Mitigation Plans where appropriate.

Fire Operations Guidance

FIRE OPERATIONS GUIDANCE IN BARK BEETLE STANDS[1]

Due to altered fuel conditions, personnel operating within the bark beetle environment should be aware of the imminent danger presented by dead and dying trees, falling at an increasing rate across a broad forested landscape.

Purpose and Intent

Fire Operations Guidance is mindful of Foundational Fire Suppression Doctrine in the Forest Service. The first principle is: No resource or facility is worth the loss of human life, however the wildland fire suppression environment is complex and possesses inherent hazards that can---even with reasonable mitigation---result in harm to fire fighters engaged in fire suppression operations. In recognition of this fact, we are committed to the aggressive management of risk.

This guidance provides a collection of potential hazards unique to bark beetle forests, including appropriate practices that have evolved over time within the wildland fire service. It does not provide absolute solutions to the unlimited number of situations that will occur.
This guidance within bark beetle stands was provided with the intention of being used in conjunction with existing fire risk management documents. No further protocols or rules are necessary to make informed risk management decisions for fire operations in bark beetle stands.

Tactical Hazards

- Withdrawal and/or reassessment should be considered if any of the following are present:
  - Thunderstorms in the immediate vicinity.
  - Wind speeds are strong enough that canopy movement is observed (Consider that wind speeds at eye level in sheltered areas may not indicate the much greater winds aloft)
  - Reliable communication cannot be established with the appropriate Dispatch Center and remain in place 24/7 when resources are engaged.
- Due to limited ingress or egress in remote areas or in terrain without vantage points, consider using an aerial platform for risk assessment and size up.

Potential Fire Behavior Hazards

- Due to increased potential of extreme fire behavior, when ERCs approach the 90th percentile, air reconnaissance should be on scene within 1 hour of detection.
- The following situations, though possible on any wildfire, may be accentuated in bark beetle stands:
  - Accelerated transition to crown fire (when needles are present)
  - Increased rate of spread (Surface fire)
  - Resistance to control (Heavy dead and down)
  - Frequent spotting, including long range (>.25 miles)

FIRE RESPONSE SUPPORT FOR UNEXPLODED ORDINANCE HAZARD AREAS

Introduction

Camp Hale is a Defense Environmental Restoration Project - Formerly Used Defense Site (DERP-FUDS) project. The investigation and cleanup of unexploded ordnance (UXO) from past military uses is ongoing and being executed by the Omaha District Corps of Engineers (USACE). The potential for encountering UXO at Camp Hale varies across the site and is currently being quantified by historical research and site investigations. The information from these activities will be utilized for determining future ordnance response activities at the site that will substantially reduce the risk of explosives hazards to the public and USDA Forest Service (USFS) personnel.

Purpose

The purpose of this document is to provide guidance for fire response activities within the Camp Hale site boundaries. Due to the potential for encountering UXO, ordnance safety protocols must be incorporated with fire safety protocols in order to safely address

1 Available at: http://gacc.nifc.gov/rmcc/dispatch_centers/r2ftc/documents/BB_IA_Guidelines_2010.pdf

fires within the potentially UXO contaminated areas of Camp Hale. On a fire-to-fire basis ordnance response support activities (i.e. OE safety training and anomaly avoidance support) will be provided as appropriate.

Site Description
Camp Hale is predominately located in the White River National Forest but portions of the site extend into the San Isabel and Arapahoe National Forests also. The main cantonment area of Camp Hale is located just off Highway 24 between Leadville, Colorado and Minturn, Colorado in Eagle County. The White River National Forest encompasses two and one-quarter million acres and ranks as one of the top five Forests nationwide for recreational use. Camp Hale was placed on the National Register of Historic Places in 1992.

Site History
Camp Hale was established in 1942 on 116,188 acres, which was acquired by purchase from private owners and by use permits from the U.S. Department of Agriculture. The size of Camp Hale varied between 5,000 acres and 247,243 acres during the time it was active. The site was used between 1942 to 1949 for various training exercises by the 99th Infantry Battalion, 10th Mountain Division, 38th Regimental Combat Team and various active and reserve units from Camp Carson (Ft. Carson). From 1959 to 1962 and 1963 to 1965 the CIA used portions of the site for training Tibetan guerillas. The post was deactivated in 1965 and the land was turned over to the U.S. Forest Service in 1966.

Unexploded Ordinance (UXO) Fire Hazard Areas
The Camp Hale site has been segregated into four UXO fire hazard areas (see next page). These areas are based on all historical and site information obtained to date. These areas have been color coded in order to be able to immediately assess the level of UXO hazard and appropriate fire response activities over the entire Camp Hale site. The attached Camp Hale quad maps delineate the different UXO fire hazard levels.

UXO Fire Hazard Area - RED
A red UXO fire hazard designation indicates an area with a high potential for UXO to be encountered. Historical records indicate military use consistent with UXO contamination. In addition, field investigations have confirmed UXO contamination either by recovery of live munitions or observations of UXO debris. Response actions in these areas will normally be limited to small spot fires and structure defense. On a fire-by-fire basis, the Incident Commander (IC), in consultation with the Ordnance and Explosives Safety Specialist (OESS), may direct alternate action. Upon discovery of the fire, USACE will be contacted and will provide appropriate UXO support to the IC.

UXO Fire Hazard Area - ORANGE
An orange UXO fire hazard designation indicates an area with high potential for UXO to be encountered. Historical records indicate military use consistent with UXO contamination. UXO contamination has not been confirmed by field investigations but is still considered likely to be present. Response actions in these areas will normally be limited to small spot fires and structure defense. On a fire-by-fire basis, the Incident Commander (IC), in consultation with the Ordnance and Explosives Safety Specialist (OESS), may direct alternate action. Upon discovery of the fire, USACE will be contacted and will provide appropriate UXO support to the IC.

UXO Fire Hazard Area - YELLOW
A yellow UXO fire hazard designation indicates an area that UXO is unlikely to be encountered. Historical records and/or field investigations indicate military training use of the area not typically associated with UXO contamination. For yellow hazard level areas, there are no response restrictions. USACE will be contacted for alert purposes and UXO support as appropriate.

UXO Fire Hazard Area - GREEN
A green UXO hazard designation indicates an area where there is no evidence of past military use or UXO contamination. There are no response restrictions for these areas. USACE will be contacted for alert purposes and UXO support as appropriate.

Fire Response Operations
The table below provides fire operations guidance for the four designated UXO hazard areas.

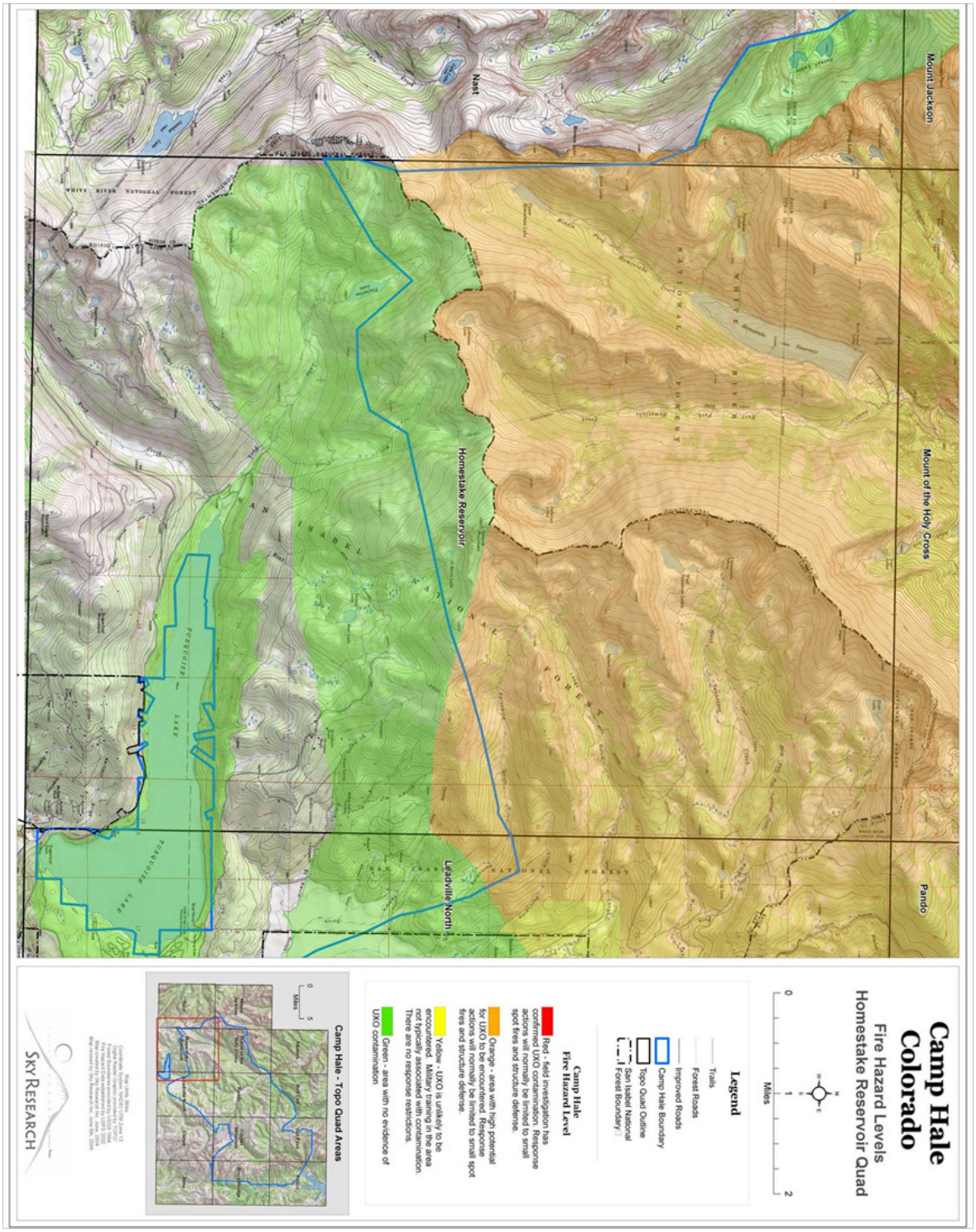
Fire Operations Guidance

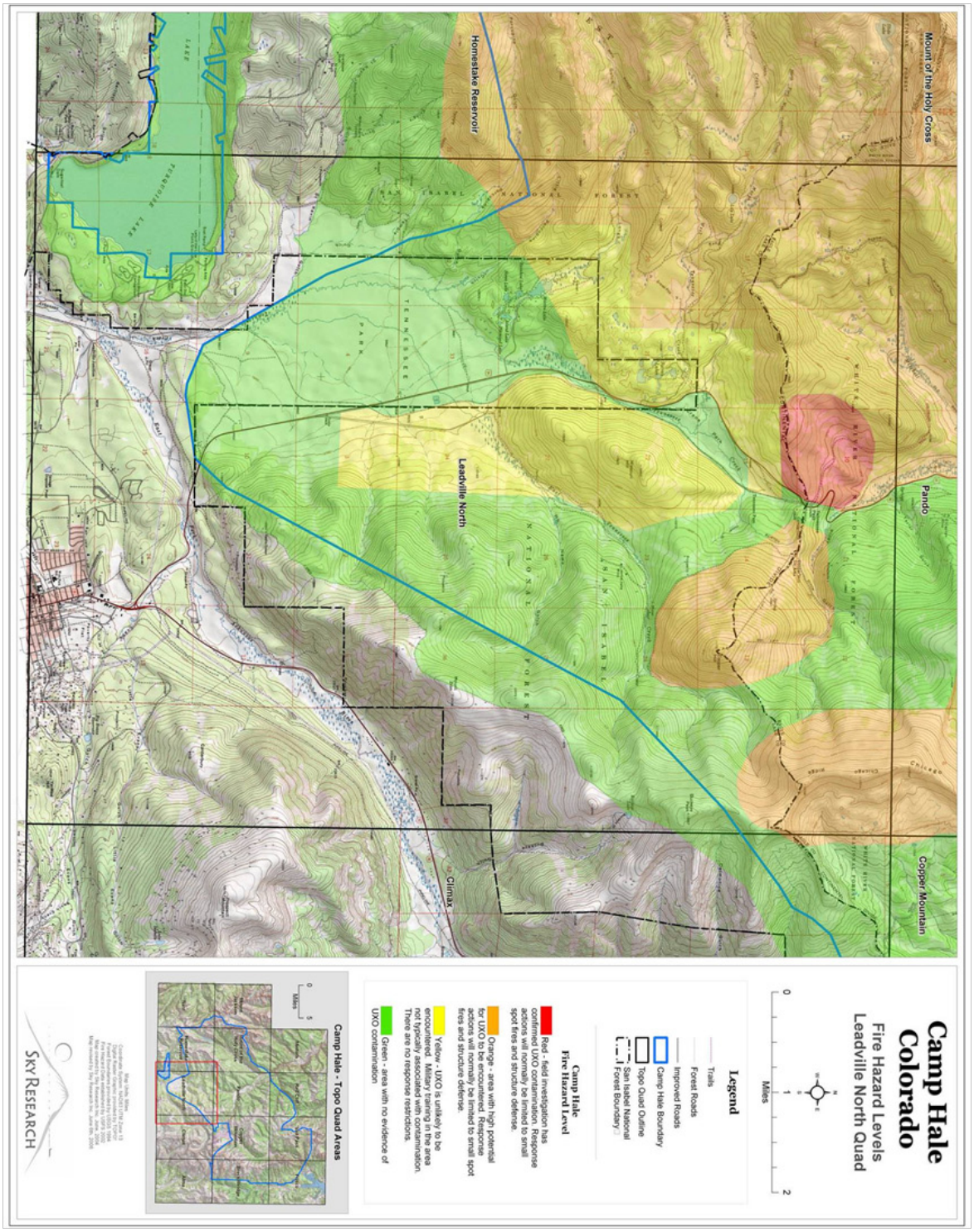
	RED	ORANGE	YELLOW	GREEN
UXO Hazard Level	**High - Confirmed** High potential for UXO to be encountered in the area.	**High - Unconfirmed** High potential for UXO to be encountered.	**Low** UXO unlikely to be encountered in the area.	**Remote** UXO unlikely to be encountered in the area.
Description of UXO Hazard Level Color Code	UXO contamination confirmed by recovery of live munitions or field observation of UXO debris.	Historical records indicate military use consistent with high potential for UXO contamination. UXO contamination has not been confirmed but is likely to be present.	Historical records indicate military training use of the area not typically associated with UXO contamination.	No evidence of past military use of the area or UXO contamination.
Initial Fire Response Actions and Notifications	Fire response (land and air) will be limited by potential for UXO hazards. Monitor fire activity from safe distance at least 2,000 feet from fire. Do not respond into fire area without UXO safety support. Consult USACE for site specific hazards and safety recommendations.		No restrictions on fire response actions. Notify IC of UXO hazard level, and safety protocols should potential UXO be encountered. Notify USACE.	No restrictions on fire response actions. Notify IC that fire is within Camp Hale boundary and of the safety protocols should potential UXO items be encountered. Notify USACE of fire response.
Fire Response Restrictions	Response normally limited to small spot fires and structure defense. On a fire by fire basis, in consultation with the OESS, the IC may direct alternate actions.	Response limited to small spot fires and structure defense. On a fire by fire basis, in consultation with the OESS, the IC may direct alternate actions.	No restrictions.	No restrictions.
UXO Support Actions	UXO team(s) will respond to the fire and provide appropriate UXO support to the IC.	UXO team(s) will respond to the fire and provide appropriate UXO support to the IC.	Contact USACE for alert purposes and UXO support as necessary.	Contact USACE for alert purposes and UXO support as necessary.
UXO Encountered during Fire Response	Evacuate area immediately to predetermined stand-off distance (2000' unless otherwise directed by the OESS or IC). When appropriate USFS and OESS will contact the 764th Ordnance Company from Ft. Carson, Colorado to address the item.			

Roles and Responsibilities

- The primary team members and their responsibilities in executing the ordnance response activities at Camp Hale are provided below:
- United States Army Corps of Engineers (USACE, Omaha District). The Omaha District has overall management, contractual, and funding responsibility
- United States Army Corps of Engineers (USACE, St. Louis) District). The St. Louis District has the responsibility for performing the site investigations and preparing the archive search report.
- United States Army Corps of Engineers (USACE, Huntsville Engineering and Support Center). The Huntsville Ordnance/ Explosives Mandatory Center of Expertise (OE-MCX) and OE Design Center provide technical support to the Omaha District
- United States Forest Service (USFS). USFS owns and manages most of the land in which Camp Hale is located.
- Colorado Department of Public Health and Environment (CDPHE). CDPHE is the responsible regulatory agency.

Fire Operations Guidance




Camp Hale
Colorado
Fire Hazard Levels
Leadville North Quad
Legend
Trails
Forest Roads
Improved Roads
Camp Hale Boundary
Topo Quad Outline
San Isabel National Forest Boundary
Camp Hale
Fire Hazard Level
Red - field investigation has confirmed UXO contamination. Response actions will normally be limited to small spot fires and structure defense.
Orange - area with high potential for UXO to be encountered. Response actions will normally be limited to small spot fires and structure defense.
Yellow - UXO is unlikely to be encountered. Military training in the area not typically associated with contamination. There are no response restrictions.
Green - area with no evidence of UXO contamination
Camp Hale - Topo Quad Areas
Miles
Mount of the Holy Cross
Pando
Copper Mountain
Homestake Reservoir
Leadville North
Climax
SKY RESEARCH

Fire Operations Guidance

Wildland Fire List by Alarm Date/Time

Alarm Date Between {11/09/1991} And {11/09/2011}

Incident	Alm Date	Alm Time	Location	Acres Burned	Suppr Cost
98-0000668	05/02/19	16:19:00	314 Miele LA	0	$0
98-0000860	06/13/19	19:45:00	The Territories at Cordillera/Avon, CO	0	$0
98-0000886	06/18/19	18:32:00	32137 US Highway 6	0	$0
98-0000962	07/01/19	18:50:00	Township 4 S., Range 83 W., Section 14	3	$0
98-0000992	07/05/19	15:19:00	Range: 82 West	5	$0
98-0001053	07/18/19	20:42:00	881 W Beaver Creek BLVD /Avon, CO 81620	0	$0
98-0001237	08/17/19	18:22:00	Legends DR	1	$25
98-0001292	08/25/19	21:06:00	105 Edwards Village BLVD	0	$0
98-0001363	09/07/19	16:27:00	397 Lake Creek RD	0	$0
98-0001364	09/07/19	16:50:00	1156 Deer BLVD /Avon, CO 81620	0	$0
98-0001450	09/20/19	11:40:00	Jeep road S.E. of the summit of	0	$0
98-0001466	09/22/19	15:32:00	T4S, R82W, SW 1/4, SW 1/4, Section 31	2	$0
98-0001841	11/27/19	15:06:00	385 Country RD	1	$0
98-0001974	12/18/19	16:02:00	82 E Beaver Creek BLVD /Avon, CO 81620	0	$0
99-0000532	03/24/19	12:23:00	6325 Bruch Creek RD /Avon, CO 81620	5	$0
99-0000533	03/24/19	16:07:00	Hwy 6 horse pasture /Avon, CO 81620	5	$0
99-0000607	04/07/19	16:54:00	56 Elk PL	2	$0
99-0000699	04/28/19	10:39:00	159 US Highway 6 /Wolcott, CO 81655	0	$0
99-0000760	05/13/19	13:48:00	SE qrtr of SE qrtr. Section 8, Rng 81 W,	3	$0
99-0000922	06/18/19	15:11:00	NE qtr of SE qtr, section 3, T-5S,	0	$0
99-0001019	07/02/19	20:20:00	881 W Beaver Creek BLVD /Avon, CO 81620	0	$0
99-0001024	07/04/19	15:15:00	Nottingham Ranch RD /Near the Concrete	0	$100
99-0001041	07/05/19	21:35:00	39169 US Highway 6 /Eagle-Vail, CO 81620	0	$10
99-0001044	07/06/19	16:21:00	US Highway 6 /Eagle County, CO 00000	0	$660
99-0001298	08/13/19	15:56:00	164 W Interstate 70 /Eagle County, CO	0	$0
99-0001384	08/25/19	11:10:00	166.5 E Interstate 70 & E Interstate 70	2	$0
99-0001621	10/13/19	10:30:00	Hillside behind Safeway in Vail/Vail, CO	28	$0
00-0000642	04/08/20	12:14:00	Salt Creek Ranch	30	$0
00-0000643	04/08/20	12:36:00	Eby Creek and Salt Creek/Eagle, CO 81631	30	$0
00-0000651	04/09/20	13:49:00	SE 1/4, SE 1/4, Section 2, T5S, R86W	10	$0
00-0000677	04/14/20	13:47:00	Next to the Eagle Co. Airport/Gypsum, CO	0	$0
00-0000681	04/14/20	19:22:00	Manpower Page to Gypsum for Wildland	0	$0
00-0000800	05/03/20	14:37:00	NE 1/4, of SW 1/4, Section 1, T2S,	30	$0
00-0000863	05/16/20	13:55:00	161 Interstate 70 /Red Canyon Rd @	3	$0
00-0000994	06/08/20	15:36:00	W US Highway 6 & W US Highway 6 /Avon,	3	$0
00-0000995	06/08/20	16:34:00	16 US Highway 6 /State Bridge/Wolcott,	0	$0
00-0001180	07/04/20	23:02:00	61 Pinto DR /Berry Creek, CO 81632	0	$0
00-0001208	07/08/20	16:07:00	R 82W/ T 4S/ Sec. 6/ NW quad	0	$0
00-0001288	07/19/20	08:16:00	830 Nottingham RD /Avon, CO 81620	0	$0
00-0001292	07/19/20	16:17:00	Colorado River RD /Gypsum, CO 81637	1	$0
00-0001328	07/24/20	20:12:00	Singletree RD /Avon, CO 81620	0	$0
00-0001363	07/28/20	13:43:00	Eby Creek	0	$0
00-0001372	07/29/20	05:30:00	Eby Creek	100	$0
00-0001429	08/05/20	13:15:00	161 W Beaver Creek BLVD /Avon, CO 81620	0	$0
00-0001475	08/10/20	17:47:00	Sweetwater/Gypsum, CO 81637	5	$0

11/09/2011 16:28 Page 1

Wildland Fire List by Alarm Date/Time

Alarm Date Between {11/09/1991} And {11/09/2011}

Incident	Alm Date	Alm Time	Location	Acres Burned	Suppr Cost
00-0001486	08/11/20	18:10:00	Derby Creek/Gypsum, CO 81637	0	$0
00-0001525	08/16/20	13:10:00	Horse Mountain Ranch	2	$0
00-0001520	08/16/20	13:34:00	.5 miles south east of Buckhorn	0	$0
00-0001521	08/16/20	14:32:00	unknown /Avon, CO 81620	0	$0
00-0001552	08/20/20	10:22:00	MM 3.2 off of Bellyache Ridge	0	$0
00-0001594	08/26/20	14:03:00	217 US Highway 6 /Eldon Wilson	1	$0
00-0001799	09/29/20	18:28:00	32700 US Highway 6	0	$0
00-0001815	10/02/20	18:17:00	1842 Lake Creek RD	0	$0
00-0001827	10/04/20	15:56:00	170 W Interstate 70 /South side of	0	$0
01-0000317	02/18/20	12:20:55	MM18 Highway 131 /Wolcott, CO 81655	0	$0
01-0000668	04/17/20	14:02:30	16 Hwy 131 McCoy Area/McCoy, CO 80463	1	$0
01-0000683	04/19/20	15:50:46	Berry Creek Hill	0	$0
01-0000784	05/10/20	09:51:56	T3S, R83W, Section 23 or 24/Wolcott, CO	0	$0
01-0000871	05/26/20	16:50:09	SW 1/4, NW 1/4, S 9, T4S, R82W	0	$0
01-0000877	05/29/20	00:52:04	West of Bellyache Ridge/Wolcott, CO	0	$0
01-0000882	05/30/20	12:18:56	MM 4 Trough Road - NW 1/4, NW 1/4, S-18,	0	$0
01-0000974	06/15/20	09:07:09	13793 Colorado River RD /Gypsum, CO	2	$0
01-0001033	06/23/20	21:23:38	360/80 Benchmark RD /Avon, CO 81620	0	$100
01-0001069	06/29/20	14:23:00	Red Canyon Road/Avon, CO 81620	0	$0
01-0001103	07/03/20	15:43:21	T5S, R83W, Section 10, NW/SE, Traer	0	$0
01-0001135	07/06/20	17:38:00	Bellyache Ridge Road. 1 mile past water	0	$0
01-0001260	07/25/20	17:09:28	215 Eldon Wilson/Eagle County, CO 00000	0	$0
01-0001299	07/31/20	19:35:00	Deer BLVD & Lark CT /Eagle-Vail, CO	0	$0
01-0001420	08/21/20	15:25:01	Hwy 131 MM 16/Eagle County, CO 00000	1	$0
01-0001432	08/24/20	19:32:55	166 W Interstate 70 /Eagle County, CO	0	$0
02-0000628	04/06/20	14:13:23	Eagle Ranch/Eagle, CO 81631	2	$1,000
02-0000684	04/18/20	14:36:21	332 Beard Creek RD	0	$0
02-0000722	05/02/20	13:00:00	Bailey, CO/Avon, CO 81620	2,400	$0
02-0000914	06/03/20	17:04:09	Township 4 South, Range 83 West, Sect 8,	0	$0
02-0000941	06/08/20	00:00:06	Mountain Star Road/Avon, CO 81620	6	$0
02-0000966	06/11/20	11:41:09	T6S R83W Sec15NE/Avon, CO 81620	4	$0
02-0001032	06/20/20	19:39:38	Prater RD & Village RD /Beaver Creek, CO	1	$0
02-0001054	06/23/20	19:31:49	167 W Interstate 70 /Eagle County, CO	0	$0
02-0001111	07/01/20	08:56:44	W Vail /Vail, CO 81658	2	$0
02-0001157	07/07/20	18:18:03	168 US Highway 6 /Arrowhead, CO 81632	0	$0
02-0001159	07/08/20	09:39:29	Camp Hale/Eagle County, CO 00000	1	$0
02-0001171	07/09/20	14:03:54	Township 6 South	0	$0
02-0001221	07/15/20	15:23:44	Gypsum Wildland/Gypsum, CO 81637	0	$0
02-0001235	07/18/20	16:57:00	Berry Creek Drainage: Tn-4, R-80,	0	$0
02-0001292	07/26/20	16:09:40	Red Sand Stone Park/Vail, CO 81658	1	$0
02-0001313	07/30/20	20:11:50	Railroad 1.5m South of Redcliff	0	$0
02-0001314	07/31/20	03:29:48	169 Interstate 70 /Eagle County, CO	1	$0
02-0001316	07/31/20	14:15:00	El Jebel Colorado/Eagle, CO 81631	1,580	$0
02-0001327	08/02/20	02:21:16	411 Metcalf RD /Avon, CO 81620	4	$0
02-0001394	08/11/20	12:16:12	Vail Mountain Sundance Bowl/Vail, CO	0	$0

11/09/2011 16:28 Page 2

Fire Operations Guidance

Wildland Fire List by Alarm Date/Time

Alarm Date Between {11/09/1991} And {11/09/2011}

Incident	Alm Date	Alm Time	Location	Acres Burned	Suppr Cost
02-0001421	08/16/20	09:49:08	Gitalong Road	0	$0
02-0001735	10/13/20	18:16:08	2001 Colorow Road/Cordillera, CO 81632	0	$0
03-0000837	06/07/20	10:47:36	456 Jouflas Ranch RD /Bellyache Ridge,	0	$0
03-0000928	06/24/20	16:36:08	39169 US Highway 6 /Eagle-Vail, CO 81620	1	$0
03-0001023	07/06/20	07:27:00	1273 Lake Creek RD	0	$0
03-0001149	07/24/20	16:10:00	Hardscrabble Mtn - Pothole Fire/Gypsum,	5	$0
03-0001171	07/27/20	07:44:58	Apx. 1 mile East of Mountain Star Rd,	0	$0
03-0001311	08/16/20	15:08:00	Approximately .5 miles north from the	0	$0
03-0001704	10/20/20	11:30:06	Casteel Creek RD	1	$0
04-0000547	03/14/20	12:27:24	1130 Singletree RD	0	$0
04-0000612	03/26/20	11:41:26	492 Edwards Village BLVD	1	$0
04-0000813	05/09/20	17:09:51	4923 Lake Creek Village DR /Bldg 4	0	$0
04-0000898	05/25/20	10:10:46	MM164 W Interstate 70 /Eagle County, CO	1	$0
04-0000989	06/08/20	19:19:57	Lake Creek RD	1	$0
04-0001256	07/13/20	19:37:09	1200 Block Beard Creek Road	0	$0
04-0001290	07/18/20	14:02:38	1100 Block Singletree Rd.	1	$0
04-0001427	08/08/20	13:01:25	Tigiwan RD /Minturn, CO 81645	1	$0
04-0001481	08/17/20	10:34:22	W Lake Creek RD	0	$0
04-0001570	08/30/20	21:42:49	600 Nottingham Road - Between Interstate	0	$0
05-0000735	05/05/20	22:08:07	0076 Lariat CT	0	$0
05-0001029	06/26/20	19:02:21	US Highway 131 /Eagle County, CO 00000	0	$0
05-0001054	06/30/20	15:50:43	1351 Peak View /Bachelor Gulch, CO 81620	0	$0
05-0001100	07/06/20	19:49:12	Lake Creek Village Blvd., apx. 100' west	0	$0
05-0001170	07/16/20	17:36:31	Colorado River Road/Eagle County, CO	0	$0
05-0001179	07/18/20	01:04:58	South side of bike path near Leftview	0	$0
05-0001176	07/18/20	08:45:56	Tigawon Rd and Hwy 24/Minturn, CO 81645	0	$0
05-0001194	07/20/20	17:16:55	Across from the Nottingham Park parking	1	$0
05-0001299	08/02/20	10:02:13	US Highway 131 /McCoy, CO 80463	0	$0
05-0001496	08/29/20	17:19:14	T2S, R83W, Sect. 17 south central	0	$0
05-0001603	09/15/20	07:23:09	T2S, R82W, Section 16/Bond, CO 80423	0	$0
05-0001680	09/26/20	15:41:37	MM1 Nottingham RD /Avon, CO 81620	0	$0
05-0001771	10/13/20	15:52:08	520 Nottingham RD /Avon, CO 81620	0	$0
06-0001065	05/30/20	17:54:44	Berry Creek Drainage	2	$0
06-0001148	06/10/20	12:16:56	621 Winslow RD	0	$0
06-0001226	06/19/20	18:59:06	225 Main (Edwards) ST	0	$0
06-0001240	06/21/20	14:04:22	mm157 E Interstate 70 /Eagle County, CO	0	$0
06-0001283	06/27/20	08:38:22	998 W Beaver Creek BLVD /Avon, CO 81620	0	$0
06-0001553	07/30/20	12:53:45	162 E Interstate 70 /Eagle County, CO	0	$0
06-0001663	08/11/20	13:42:30	Bike Path Between Brett Ranch and Lake	0	$0
06-0002041	10/12/20	13:22:47	Cemetery RD /Minturn, CO 81645	1	$0
06-0002099	10/19/20	17:14:22	150 Miller Ranch RD	0	$0
06-0002207	11/08/20	17:34:34	MM 164 E Interstate 70 /Eagle County, CO	0	$0
07-0001108	06/11/20	13:56:47	mm161.5 W Interstate 70 /Eagle County,	0	$0
07-0001139	06/14/20	17:34:58	901 W Beaver Creek BLVD /PO Box	1	$0
07-0001164	06/18/20	12:35:41	MM 167 W Interstate 70 /Eagle County, CO	0	$0

11/09/2011 16:28 Page 3

Wildland Fire List by Alarm Date/Time

Alarm Date Between {11/09/1991} And {11/09/2011}

Incident	Alm Date	Alm Time	Location	Acres Burned	Suppr Cost
07-0001277	07/03/20	17:51:11	T4S, R82W, S33 - Berry Creek Area	10	$0
07-0001291	07/05/20	01:36:53	161 W Beaver Creek BLVD /P.O. Box 5510,	0	$0
07-0001475	07/29/20	16:03:31	Stone Creek drainage./Eagle-Vail, CO	0	$0
07-0001480	07/30/20	10:08:04	MM 165 Interstate 70 /Eagle County, CO	0	$0
07-0001600	08/13/20	12:34:13	Wyoming and Montana/Avon, CO 81620	1	$0
07-0001709	08/28/20	17:17:12	167.5 W Interstate 70 /Eagle County, CO	0	$0
07-0001833	09/16/20	13:30:46	R82W, T4S, Section 32	0	$0
07-0002077	11/01/20	13:14:11	Twnshp 6 South/ Range 81 West/ Section 2	0	$0
08-0001063	05/07/20	13:46:47	32270 US Highway 6	0	$0
08-0001339	06/20/20	17:15:45	T5S - R81W - Sec. 17/Eagle County, CO	0	$0
08-0001357	06/22/20	17:29:30	T4S R83W Section 26 Quadrant SE/Wolcott,	0	$0
08-0001358	06/22/20	17:48:19	R83W, T4S, SEC 36 NW QUAD./Eagle County,	0	$0
08-0001369	06/23/20	17:09:31	Cottonwood RD /Avon, CO 81620	0	$0
08-0001384	06/25/20	14:29:53	288 Edwards Access/Spur RD	0	$0
08-0001415	06/28/20	19:26:38	39169 US Highway 6 /PO Box 6422,	0	$0
08-0001471	07/04/20	16:56:00	Enterance to The Reserve, North End of	0	$0
08-0001479	07/04/20	20:53:31	189 Old County LA	0	$0
08-0001498	07/06/20	16:34:06	Off bike path between Brookside	0	$50
08-0001541	07/10/20	16:16:30	Northern California/Redding, CA 90461	1	$0
08-0001554	07/12/20	18:14:02	351 Benchmark RD /Avon, CO 81620	0	$0
08-0001735	08/02/20	21:05:21	R 80 W, TS 7 S, Section 16/Minturn, CO	0	$0
08-0001820	08/14/20	11:57:32	407 Meadow RD	0	$0
08-0001884	08/21/20	12:42:41	Red Canyon Creek RD	0	$0
08-0001889	08/21/20	22:22:59	Red Canyon Creek RD	0	$0
08-0002141	09/29/20	18:35:48	166 E Interstate 70 /Eagle County, CO	0	$0
08-0002210	10/10/20	03:01:31	33520 US Highway 6 /P.O. Box 250	0	$0
09-0001260	07/13/20	20:12:01	Above the Eagle Springs Golf	1	$0
09-0001324	07/22/20	09:35:03	101 Legends DR	0	$0
10-0000602	04/11/20	16:51:52	32700 W US Highway 6	0	$0
10-0000628	04/20/20	15:47:10	164 W Interstate 70 /Eagle County, CO	0	$0
10-0000844	06/05/20	07:15:58	480 Nottingham RD /Avon, CO 81620	0	$0
10-0000918	06/16/20	14:31:58	24745 US Highway 24 /Minturn, CO 81645	0	$0
10-0001032	07/06/20	11:56:49	T - 6S, R - 80W, Section 19/30./Eagle	0	$0
10-0001321	08/21/20	13:18:14	86 Blue Flax /Avon, CO 81620	0	$0
10-0001326	08/22/20	15:16:42	211 Rawhide RD	0	$0
10-0001488	09/20/20	17:19:02	Beard Creek Road	0	$0
10-0001520	09/25/20	19:04:03	34295 US Highway 6 /PO Box 2264/Edwards	0	$0
11-0000955	06/07/20	17:29:51	Wallow Fire, Eagar, Arizona/Avon, CO	540,000	$0
11-0001003	06/17/20	18:29:05	T6S, R81W, Sect 35 SW corner/Eagle	0	$0
11-0001109	07/04/20	14:49:38	Between RR Tracks and Bike Path to the	0	$0
11-0001129	07/07/20	16:46:56	200 Benchmark RD /Avon, CO 81620	0	$0
11-0001159	07/13/20	19:13:07	164 E Interstate 70 /Eagle County, CO	0	$0
11-0001350	08/09/20	13:35:25	Hillcrest DR	0	$0
11-0001519	09/05/20	09:58:23	Berry Creek draininage at the top of the	0	$0
11-0001558	09/11/20	15:16:51	Stone Creek Drainage - Eagle-Vail/Eagle	0	$0

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ANCHOR POINT

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