

Four Mile -Currant Creek Community Wildfire Protection Plan

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**Four Mile Fire Protection District – Teller County
Southern Park Fire Protection District – Park County
Tallahassee Fire Protection District – Fremont County**

2013

Introduction

The routes to the Pikes Peak Region gold fields shown in the cover map drew people west into Colorado and this area near the Cripple Creek gold fields. Small communities sprouted quickly in this region and expanded to provide services to the miners. Ranching, transportation, supplies, and timber also played a large part in that settlement. Though many of the small towns have faded away, settlement has continued with subdivisions scattered throughout the Four Mile /Currant Creek headwaters region.

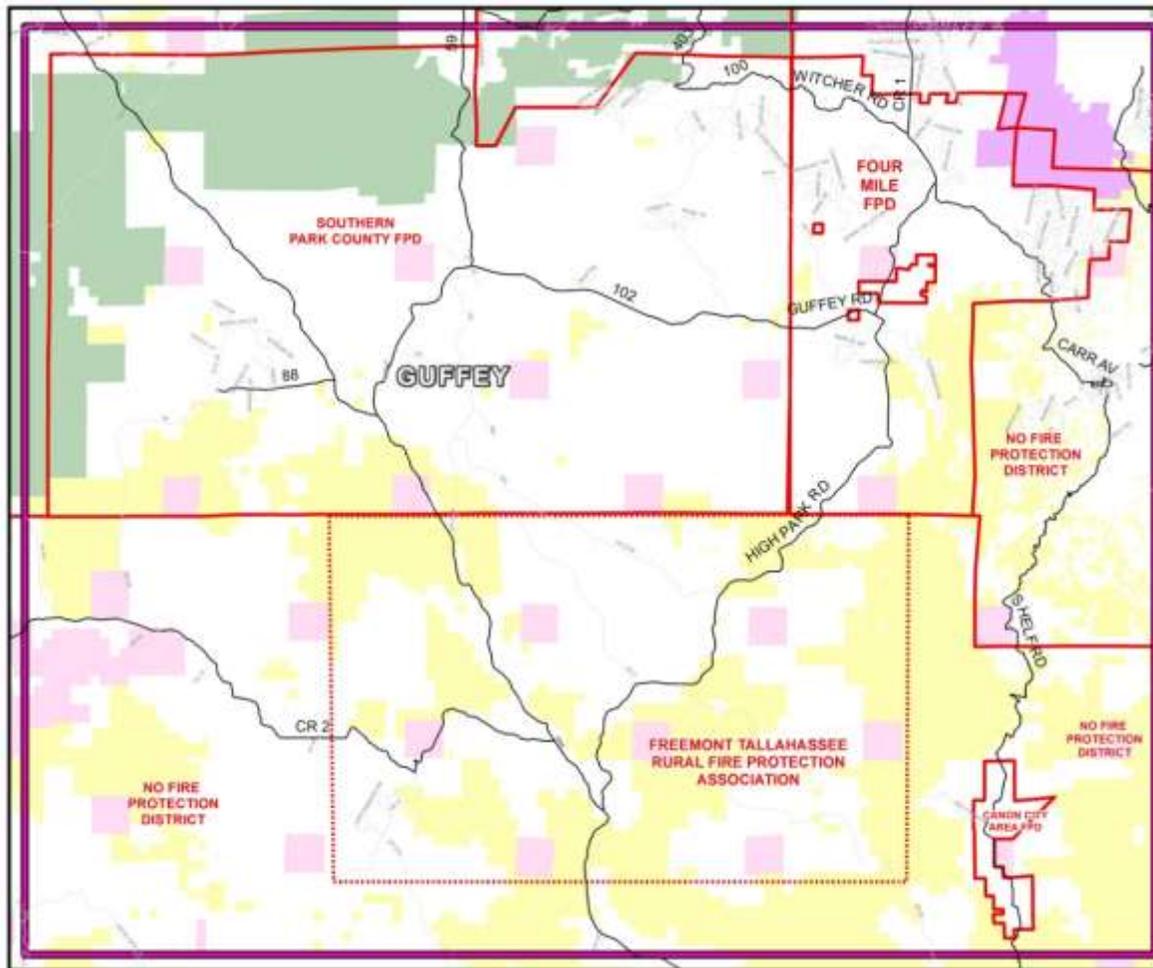
Large areas of the forest were harvested to provide timbers for the mines, ties for the railroads and lumber for businesses and homes. With the decline of the gold production in the early 1900's, timber harvest slowed to a standstill and the forests began to come back. Extensive groves of aspen covered the hill sides and a new "gold rush" of tourism began. At the same time, wildfire threat to the public became a national issue and suppression of all fires of human or natural causes was mandatory. The forest continued to grow and, without the natural thinning of wildfire, has now become over-crowded with trees competing for limited moisture, nutrients and space. Aspen is being overgrown by pines and existing groves are old and stagnant. The forests of pine and aspen we so admire are unhealthy and at high risk to catastrophic wildfire that can eliminate them all.

Overview

Before settlement, fire was a natural part of the Rocky Mountain environment. Frequent low intensity fires thinned the trees, maintained forest diversity, removed dead or down fuels and recycled nutrients necessary for healthy forest growth. These naturally occurring fires also promoted a variety of other vegetation that provided food sources and habitats necessary for wildlife to thrive.

As people moved into the wildland, wildfire was seen as a destructive force to be avoided at all cost. The strict fire suppression activities of the last century were meant to protect human life and communities, but those actions have interfered with the natural wildfire cycle. Forest fuel levels have increased so that fires ignite more easily and burn with greater intensity. Due to prolonged drought and overcrowded forest conditions, many types of trees are more susceptible to insects and disease. The rapid expansion of residential housing and other development in the wildlands has greatly increased the likelihood of wildfires and the difficulty of managing those fires.

In the current drought and forest conditions, wildfires have the potential to reach catastrophic proportions. Fire managers can no longer focus only on perimeter control and containment of fires until they go out. They must also deal with evacuation and safety of residents, protection of homes, higher fire intensities and heavy media interest. These factors require high levels of cooperation and coordination across jurisdictional and agency boundaries.



Wildfire respects no boundaries. The area covered in this CWPP include several communities and subdivisions located in three fire protection districts in three adjacent counties, and multiple parcels of Federal, State and BLM managed lands . Fremont, Park and Teller Counties each have broad scale, county-wide CWPP's that include this area in general assessments and have targeted areas of concern that are the focus of this plan. Working together, the participants have developed this Plan to provide a strategy for improving awareness and preparedness, acting cooperatively and efficiently in fuel mitigation projects, and understanding emergency response.

The area of this CWPP is assessed without boundaries to identify locations with a higher potential for catastrophic wildland fire regardless of ownership. Due to the different jurisdictional responsibilities, specifics regarding each of these county segments will be covered separately in this document.

Background

The fire seasons of 2000 and 2002 led to the 2003 enactment of the Healthy Forests Restoration Act (HFRA or the Act) by the Federal government.¹ In the HFRA, Congress encouraged vulnerable communities to prepare Community Wildfire Protection Plans (CWPPs).

Requirements for Community Wildfire Protection Plans

The HFRA encouraged the use of CWPPs to aid communities in strategic planning to reduce the risk of wildfire. Such plans are to identify critical sites and methods for fuel reduction projects across the landscape and across jurisdictional boundaries. The Act requires the following items of a CWPP:

- a. Collaboration between private landowners, emergency services personnel and federal and state land managers.
- b. Identification and prioritization of fuel reduction strategies and treatments, with recommendations for the future.
- c. Recommendation of measures that homeowners and communities can take to reduce ignitability of structures.

The Colorado State Forest Service (CSFS) issued guidance on the development and management of CWPPs² and revised the guidance in November 2009.

The intent of a Community Wildfire Protection Plan (CWPP) is to take a closer look at the scientific factors that influence fire behavior in a particular area or region. Once the hazardous areas are classified, further assessment can determine locations of high values – subdivisions, critical infrastructure, and natural resources. These are balanced with local community values to design mitigation plans to reduce the threat of catastrophic wildland fire. These critical areas and values can then be prioritized to use available funding to achieve best possible results. Mitigation can be costly on any lands, public or private, but does reduce the intensity and human impact of wildland fire. This plan was funded by a Community Assistance grant sponsored by the Bureau of Land Management.

Methods

Much of the scientific evaluation of this area was done using Economic and Social Research Institute (ESRI) Arc View® GIS, Spatial Analyst® and other software to produce maps of Current satellite data that includes geographic terrain features and vegetation. GIS and facilitation of the plan was provided by the Coalition for the Upper South Platte. Evaluation of these maps was provided by local wildland fire professionals of the Bureau of Land Management and Colorado State Forest Service. Additional information was provided by fire districts regarding access, department capability, and water resources. County Assessor's Offices provided data of structure locations and identified property ownership as public or private lands. The Office of

¹ "The Healthy Forests Restoration Act," Society of American Foresters,

² "Community Wildfire Protection Planning," Colorado State Forest Service,
<http://csfs.colostate.edu/pages/community-wf-protection-planning.html>.

Emergency Management in each county included the information regarding critical infrastructure in the area that would be threatened by catastrophic fire.

Community values and comments were assessed by posting this document on county and fire department websites and distribution of hardcopies at various locations throughout the area. Local residents were encouraged to provide input on priority areas to be included in the planning process.

Types of Wildfires

Wildfires can be broadly categorized into two types based on the intensity of the fire and the damage caused to the environment. The most severe type is a crown fire, such as the Hayman Fire of 2002. A crown fire burns in the canopy of the forest, jumping from treetop to treetop, killing most if not all of the trees in its path, and producing extreme heat. The frequent high winds in this area and overcrowded forests increase the risk of crown fires.

One of the most dangerous aspects of a crown fire is that it also produces its own “wind” as it burns. These winds are often strong enough to throw burning brands or embers a mile or more away from the flames. These brands cause new spot fires and are responsible for many home ignitions.



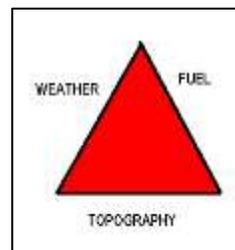
The high heat produced in a crown fire may “bake” and damage the soil. Long after a crown fire is extinguished, precipitation runs off the burned soil causing flash flooding and environmental degradation far from the burn area. In addition, because of the intense heat and soil damage connected with a crown fire, vegetation re-growth is significantly delayed.

A less severe type of fire is the so-called ground fire. This type of fire is typical of open ponderosa pine forests and grasslands. In forests that are not overgrown, wildfires burn more slowly and often stay closer to the ground, clearing away excess fuel such as needles, fallen branches and small seedlings. Such a fire revitalizes the forest with minimal damage to the healthy trees. The heat produced is less intense and does slight damage to the soil. Due to the release of nutrients which occurs during such a fire, new herbaceous plants re-sprout quickly after the fire cools. Prescribed fires mimic this type of fire.



Factors Affecting Fire Behavior

In order to understand the wildfire hazard in in this area, it is necessary to understand the factors that influence how wildfires burn. The fire behavior triangle shows the three primary factors that influence how a wildfire will burn and spread. They are weather, topography and fuel. When specific characteristics of each of these factors are known, the behavior of a fire - where is will move and how intense it will be - can generally be predicted.

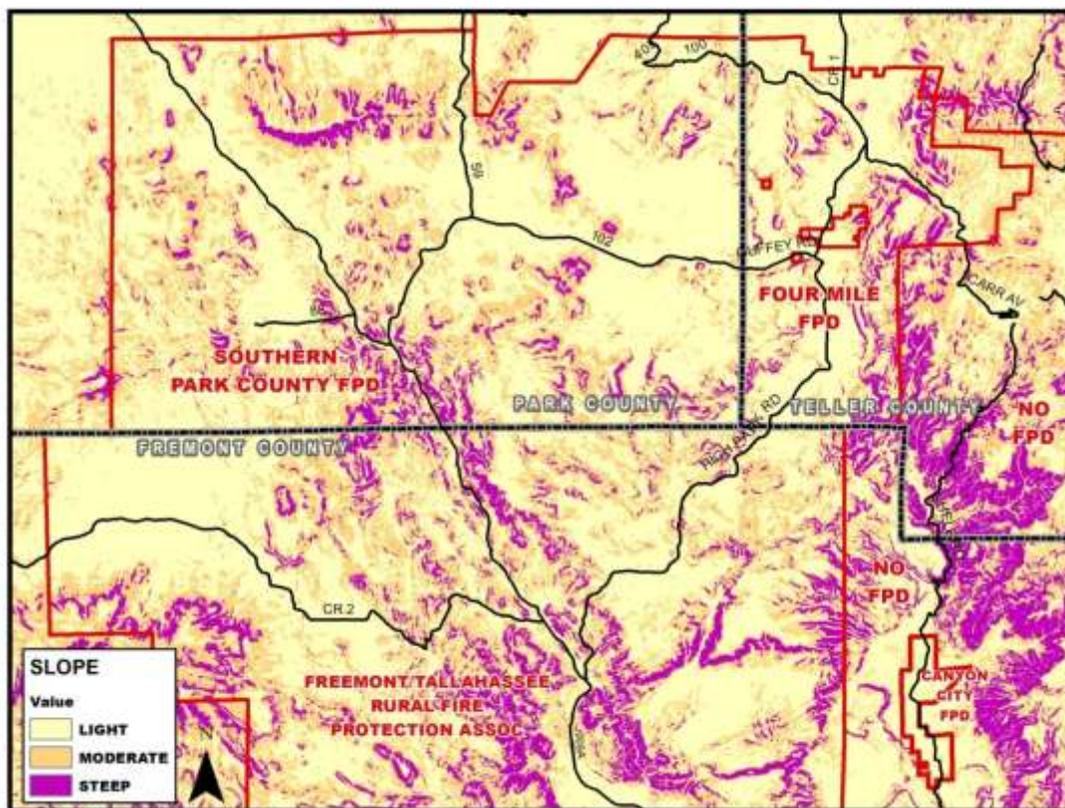


Weather

Weather is the “wild card” of fire behavior and cannot be predicted or controlled. While lightning or human activity may ignite a fire, high temperatures, low humidity and strong winds increase its intensity and movement. Dry conditions any time of year can increase the frequency and intensity of wildfires; however, such fires are usually less severe in cold seasons.

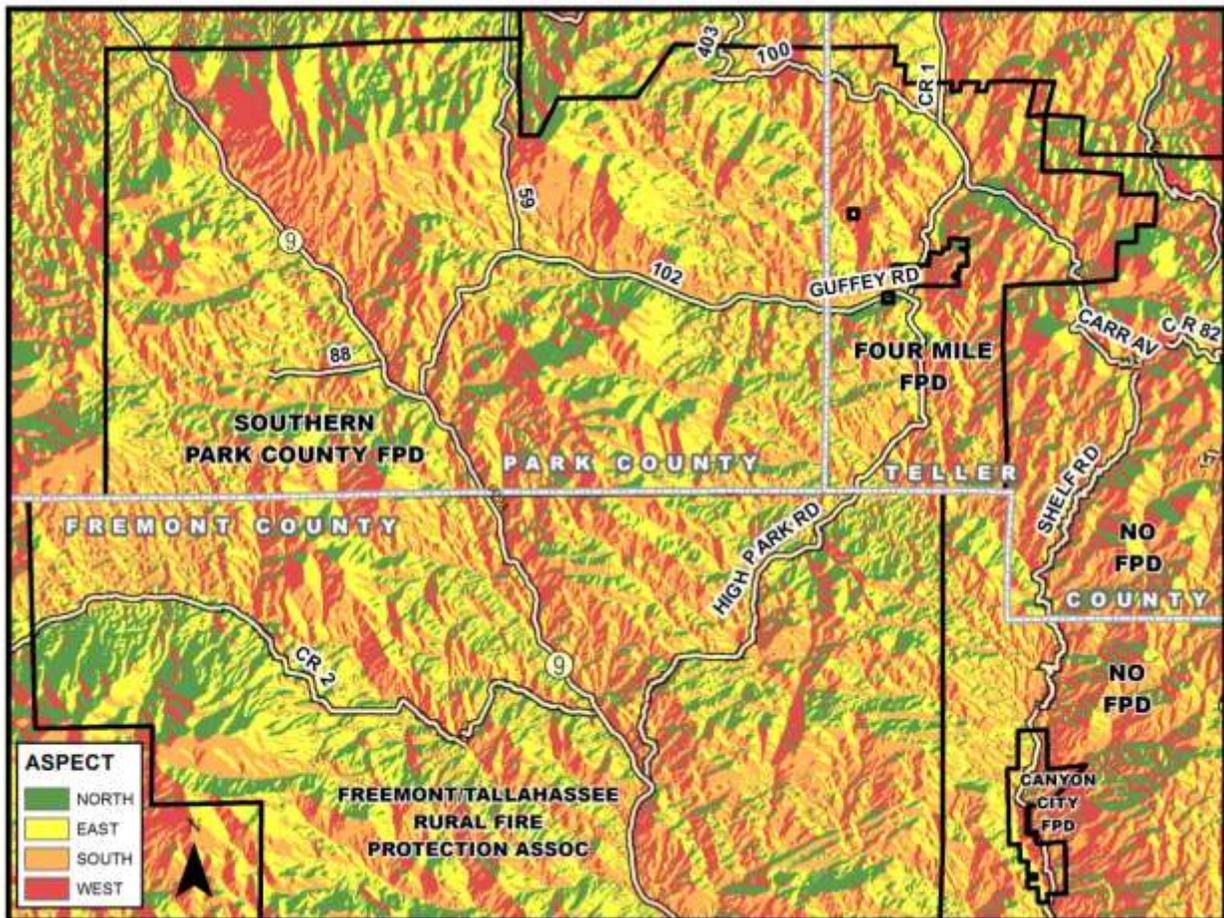
Topography

Topography is a term that describes the lay of the land. The influence of topography on wildfire is simply that heat rises. On a slope, heat rises above a fire, pre-heating and drying the fuel above. The drier upslope fuels ignite more easily and burn more quickly than downslope fuels. The steeper the slope, the more pronounced is this effect. During the day, warming air rises and pushes wildfires upslope. Fires may move four times faster up slopes than on flat ground. The map below shows the variation of slope within FMCC.



Aspect

Solar heating also plays a part in the intensity of wildfire, and solar heating is a function of the aspect, a term that refers to the primary direction that a slope faces. At this high elevation, slopes that face south and west are pre-heated and dried by strong sunlight which makes these areas more vulnerable to rapidly igniting fuels. The following map indicates the aspect of the FMCC terrain.



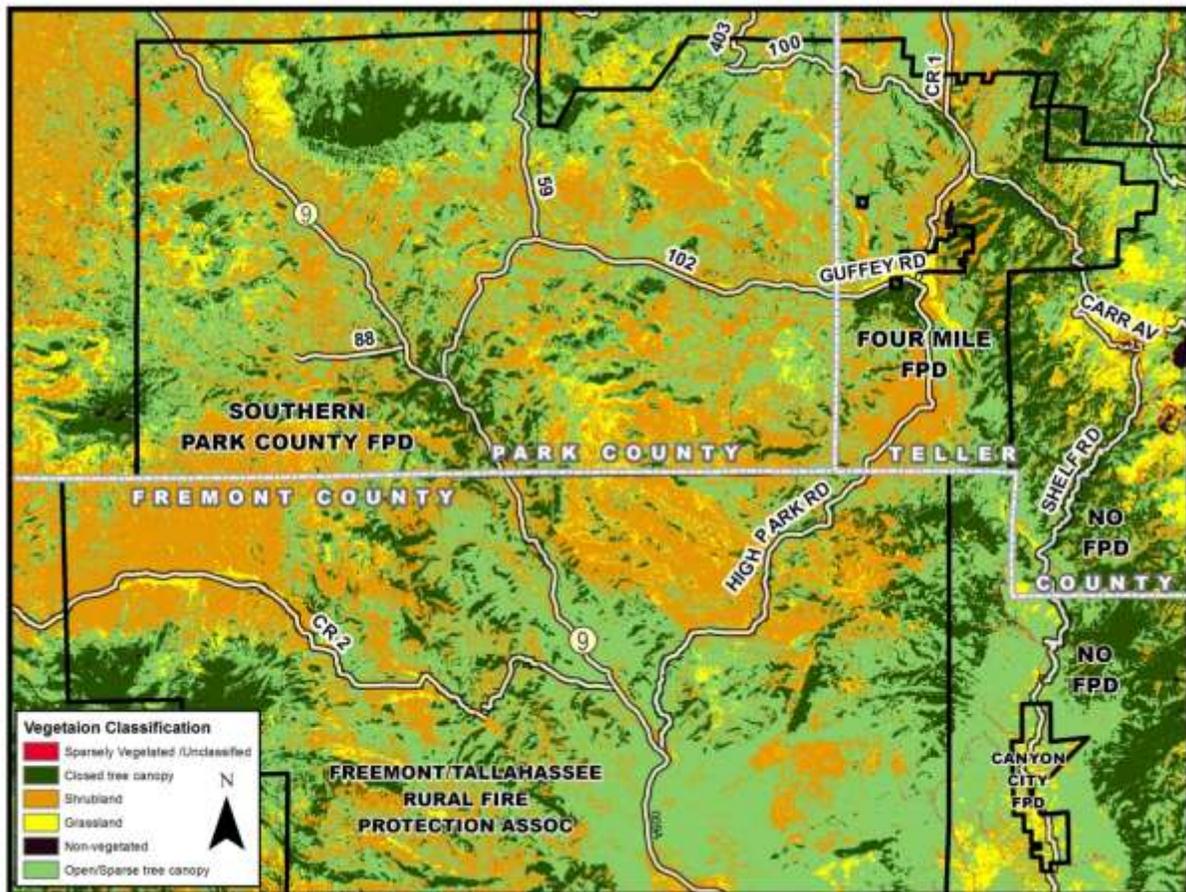
Fuel

The two types of fuel in a wildland-urban interface are vegetative and structural. The fuel available to a fire has a direct effect on how much heat is produced. Vegetative fuels consist of living and dead trees, brush and grasses. While the focus of wildfire management is usually on forested areas, some portions of the FMCC have more grassland and brush than trees. Typically, grass fires ignite more easily and move faster than forest fires. However, the fire intensity decreases quickly after the flame front has passed. Grass fires can be extremely hazardous to life and property as seen in the recent fires in Texas.

The severity of a wildfire is proportional to the amount and size of available natural fuel. Like a campfire, small diameter fuels such as dry grass or small branches ignite more easily than large diameter fuels such as large logs. In a wildfire, the smaller diameter fuels act as kindling, spreading the fire to the larger fuels. Fires burning in organic material on the forest floor usually move slowly and create relatively low heat.

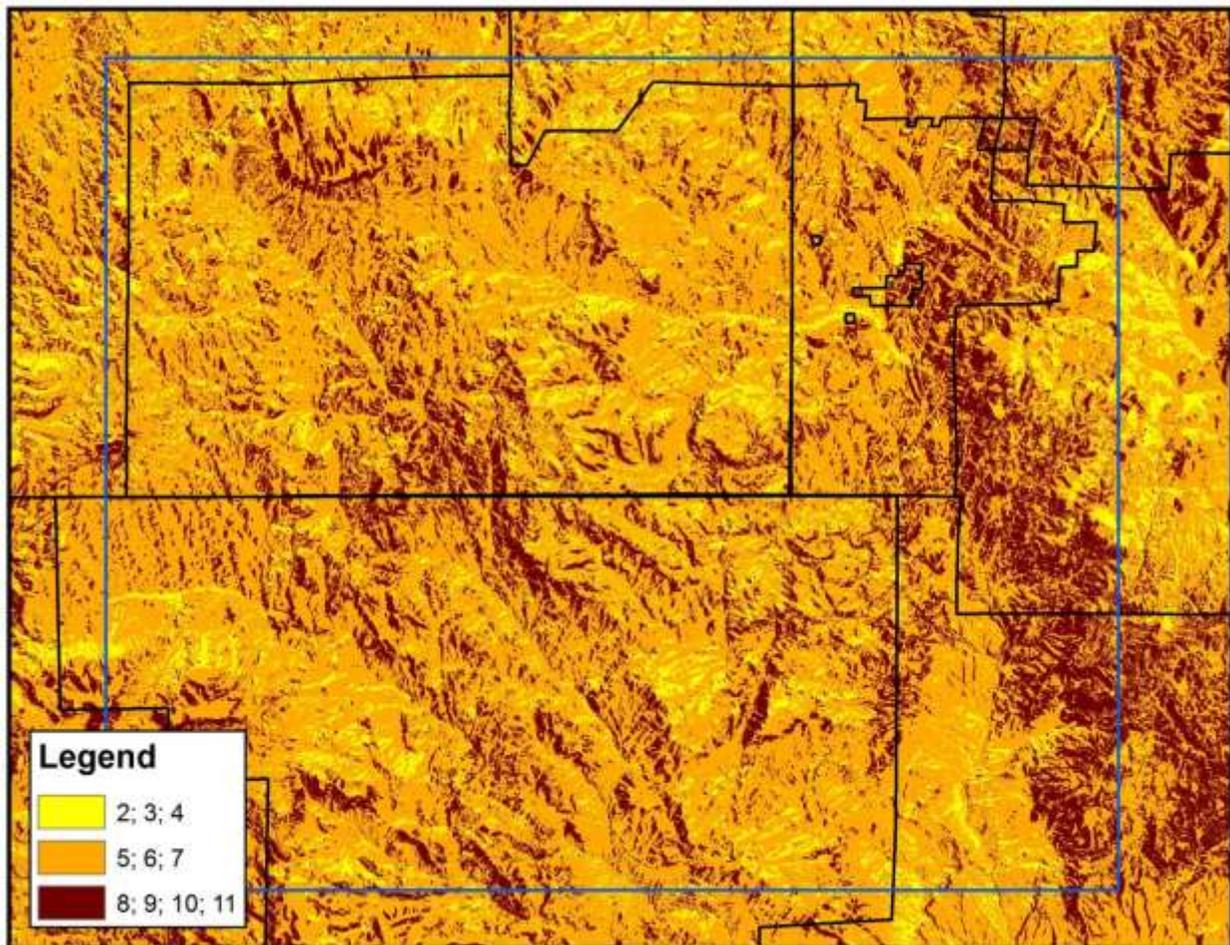
The unnaturally dense forest conditions that increase the potential for catastrophic wildfire also create the potential for cycles of insects and disease outbreaks. Trees weakened by overcrowding and competition for water and sunlight are more susceptible to invasion.

Structural fuels include houses, outdoor equipment, lawn furniture, ancillary buildings, fences and firewood. In the WUI, structures can contribute to the quantity of fuel available to a fire. Not only can a wildfire move into a structure from a forest or grassland, a structure fire can move outward into a grassland or forest and become a wildfire.



Integrated Risk Assessment

Using computer-based Geographic Information Systems (GIS), the factors that relate to fire behavior (fuels and topography) can be combined to calculate the geographic distribution of wildfire risk. Scores of 1 to 4 (1 being the lowest risk) are assigned to each of the fire behavior factors. The total scores, shown by color in the following map, provide a general representation of the areas with the highest risk of destructive fire. This map can be used to prioritize fuel mitigation projects across the entire area covered in this plan. Separate, more focused maps for each jurisdiction which includes subdivisions are included later in this document. (Fremont County, page XX; Park county, page XX; Teller County, page XX)

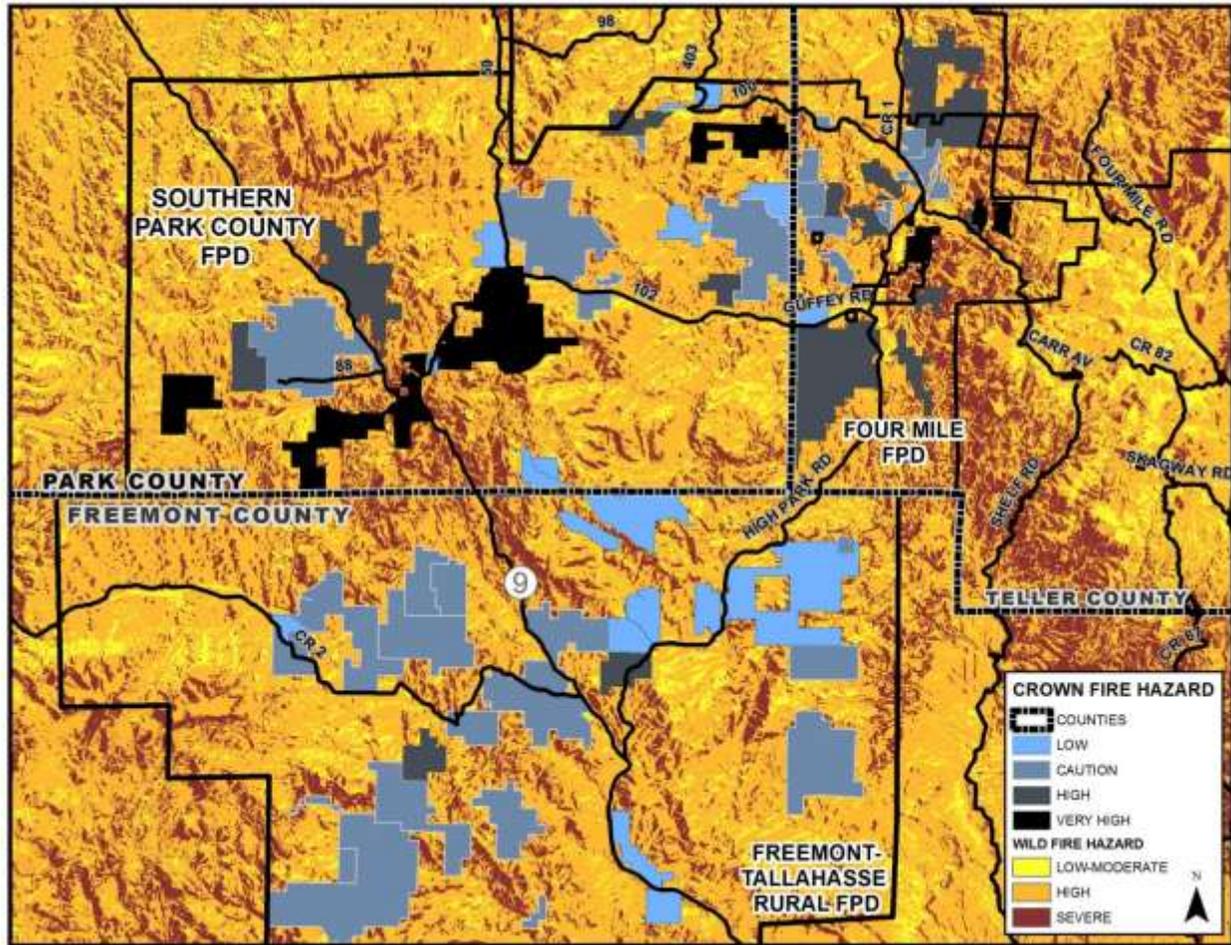


Community Assessment Strategies

Most of the factors and treatments that determine the survivability of a structure lie within one to two hundred yards of the structure, usually on private lands. The largest opportunity to decrease risk of wildfire losses is in the hands of the private property owners acting individually or as a community. (For more detailed information on structure protection activities, see reference pages.) Public land managers *do not have any legal authority or responsibility* for fire mitigation or prevention activities on those private lands.

For this CWPP, fire district personnel assessed the general fire potential of each community or development as a whole, and did not examine individual lots or sites. The results of the crown fire hazard assessments are illustrated in the map below. The form used to assess communities and a summary table can be found in Appendix A. A more detailed summary, including the ratings for each category, can be viewed at your local Fire Protection District.

When the boundaries of subdivisions and communities are added to the overall hazard map, areas of highest priority for public safety can be identified. These communities have been assessed for the risk of crown fires within the entire community, not the hazards to each property or lot. This information is useful for fuel mitigation planning on public lands that are adjacent to the private property boundary. Private lands can also use this information to design and implement fuel reduction strategies such as fuel breaks along the community boundaries. Greater risk reduction is possible when prevention activities are addressed by the community acting together.



This table displays the results in general terms for the Crown Fire Hazard Rating:

Range	Category	Description	Recommendation
3 to 8	Low	Low fuels, moderate terrain	Maintain
9 to 11	Caution	Moderate fuel accumulation, steeper slopes	Opportunity for improvement
12 to 14	High	Heavy fuel accumulation and steep slopes	Clear need for improvement
15 to 20	Very High	Extreme fuel hazards and steep slopes	High priority, mitigation essential for safety

The score for Crown Fire Hazards was based on the following factors: Vegetation – Fuels and density, Topography – steepness of terrain, Lot size – density of structures.

Of these factors, only the type and quantity of vegetation can be changed by property owners.

Community Property Loss Assessment by Fire District

The previous section is focused on the potential for crown fire to cause significant losses over a broad area based on vegetation and terrain. On the other hand, Property Loss Hazard assessment is focused on the structure materials, design of the community, and the availability of suppression response. Three volunteer fire departments assessed communities within their district boundaries for this CWPP. However, there are large areas, particularly in Fremont County, that currently have no coverage for structural fire suppression. The property owner in these areas has an even greater responsibility for mitigating the wildfire hazards to protect life and property.

This table displays the scores ranges for Property Loss Risk or Level of Preparedness:

Range	Category	Description
Less than 17	Low	Low to Moderate Hazards
18 to 24	Caution	Problem areas. Significant opportunities to increase safety and potential success of structure defense and fire suppression
Above 25	Very High	Significant controllable hazards and major opportunity to improve safety and potential success of structure defense and fire suppression

The Risk to Property scores are significantly affected by access and water issues which can negatively influence the capability and safety of structure fire suppression efforts. While many of these factors are not easily changed in the short term, there are several that can be significantly improved by the homeowner and the community with long term planning and implementation. Factors used to score the Risk to Property are:

Subdivision Design

- Ingress/ Egress
- Primary road width
- Accessibility
- Dead Ends
- Presence of Street signs

Vegetation

- Defensible Space Development

Structure Design

- Materials

Fire Protection

- Response time
- Hydrants
- Draft (water) sources

Utilities

- Placement above or below ground

Property Loss Assessment: Tallahassee Volunteer Fire Protection, Fremont County

Roughly 1/3 of Fremont County (494 sq. miles) is covered by volunteer fire departments with structure protection responsibility. The remaining 2/3 (1039 square miles) are public land or unincorporated or with no **structural fire protection** – and includes the lands and subdivisions covered by this CWPP.

Please note that not all Fire Suppression Agencies are able to manage structural fires. Some agencies are wildland fire suppression only. Insurance coverage can be affected by the type of Fire Suppression. Contact the appropriate agency for details

Agencies that **do not** provide fire suppression for structures are listed below. Structures include homes and any other type of manmade structure.

- Fremont County Sheriff's Office Wildland Fire Team
- Tallahassee Rural Fire Protection Agency
- BLM, USFS

Figure 1: Fremont County Wildfire Protection Plan, pg. 7

Tallahassee Volunteer Fire Protection (TVFP) covers 43% (384 square miles) of Fremont County, currently providing wildland fire suppression within our service area. TVFP is currently training for structure fire, vehicle accident and all hazard incident responses that will be coming on line in the near future in the area covered by this CWPP. As a result, fire mitigation on public and private lands is seen as a priority for safety of private lands and properties.

Several BLM and State land holdings are scattered through this area. Wildland fire has occurred in the past, and mitigation projects have been undertaken. Much of the remaining private land is subdivided and developed, resulting in a considerable amount of Wildland/Urban Interface.

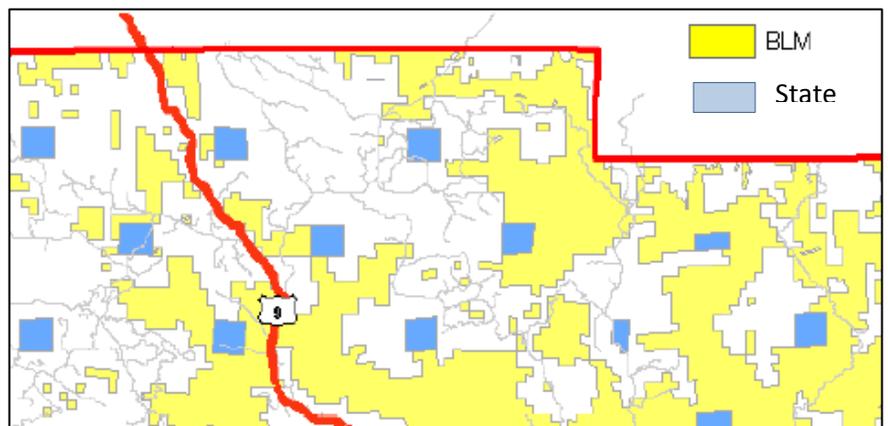
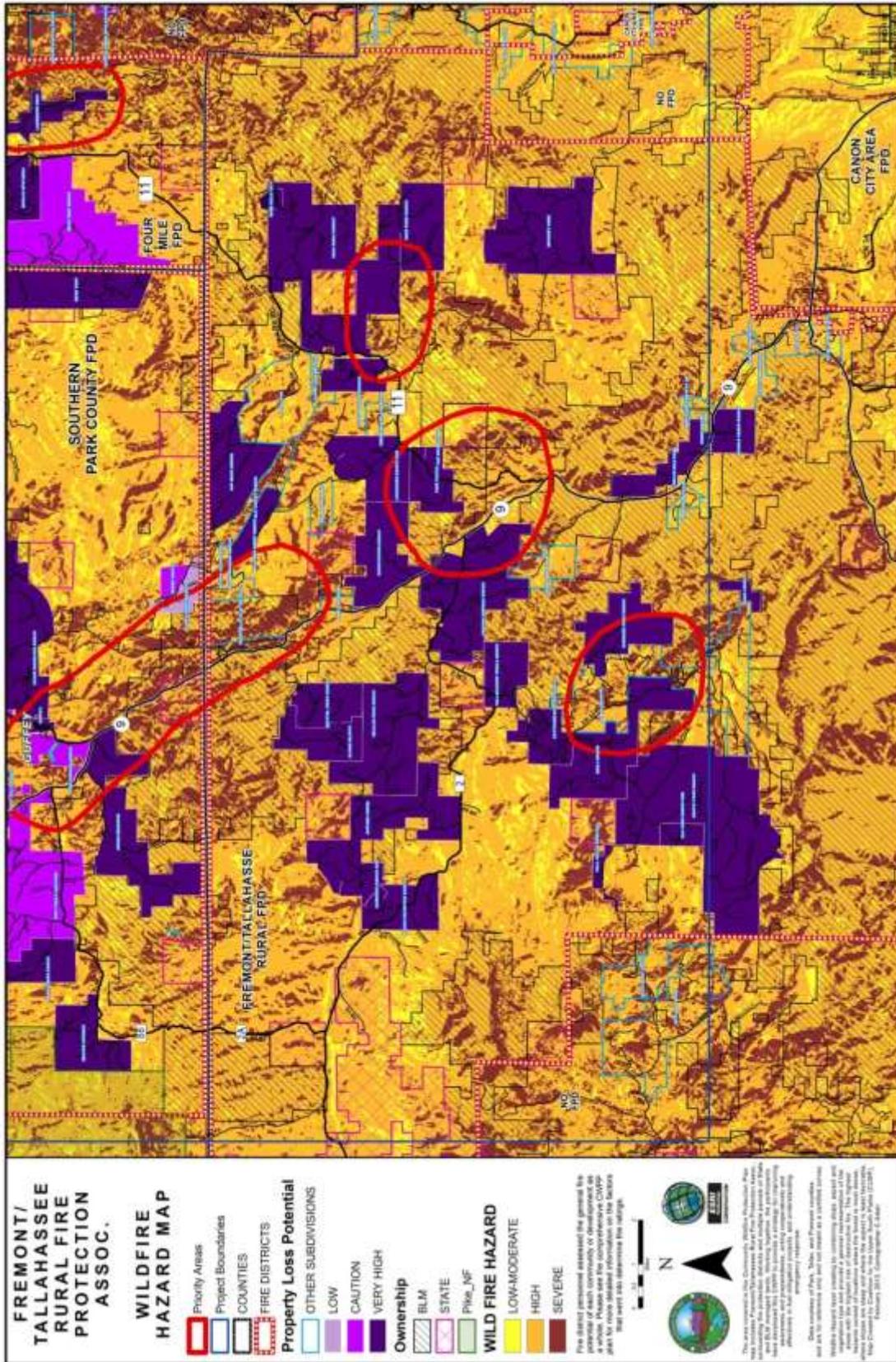


Figure 2 BLM and State ownership, Fremont County

Vegetation in this area is mixed. There are large open areas of grasslands that will burn quickly across the landscape. Throughout are mixed shrub lands, with juniper and pinyon forests at lower elevations. At higher elevations the forest type is composed primarily of Ponderosa/Douglas fir. High Priority Areas of Tallahassee Fire District are shown on map on the next page.



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The volunteers of TVFP have developed a strategic plan to improve the ability to respond to all incidents within the service area. Upgrades to the fleet of response vehicles, fire fighter training, fire fighter protective gear, improved communications, and optimizing station placement throughout the service area are occurring. Currently TVFP has 27 volunteer fire fighters, with a staffing goal of 30 to insure adequate responders at any time they are needed.

Long travel distances and the lack of ample water supplies create challenges to first responders in dealing with wild fires and other incidents. Fire mitigation on public and private lands is a priority for safety of private lands and properties.

The map on the previous page clearly shows that TVFP's service area has significant potential for property loss in the event of a wildfire. Mitigation to all improvements can buy time for the needed responders and equipment to arrive and begin fire suppression activities.

Three areas have been identified as high priority within Tallahassee Fire Protection District in Fremont County. All include subdivisions that are at high risk, have limited access and water supplies, are adjacent to major travel routes, and are located in areas with increased response time.

Recommendations:

1 Each community should take responsibility for reducing the fire hazards on private property. While there are plans to provide service for structure fire protection, it is not yet available. Fuel reduction around structures is the first line of defense and will decrease the hazards for the property owner. Information regarding such activities is included in this document.

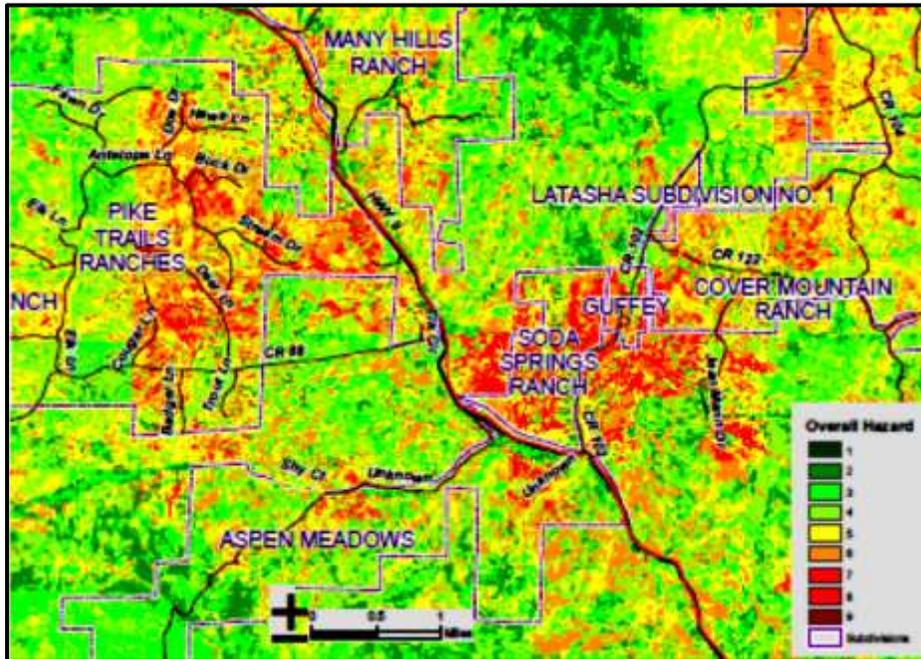
#2 Subdivisions in this area are widely spaced and have few access roads. Emergency evacuation options should be investigated and plans should be created for each community with assistance from the fire department. Alternate routes should be identified wherever possible.

#3 Water for fire suppression is in short supply throughout the district. Communities should investigate and install cisterns at suitable locations to improve the capabilities of fire suppression efforts. More information is available from your fire department.

#4 Many of the communities in the high priority areas are bordered by BLM lands. These boundaries should be given high priority for fuel reduction projects by appropriate methods.

Property Loss Assessment: Southern Park County Fire Protection District, Park County

The Southern Park County Fire Protection District was identified as the third priority area for wildfire hazard mitigation in the Park County 2007 CWPP. At that time, this area was characterized by moderate to high fuel hazards with high fire risk and occurrence. There have been several moderate sized fires in this general area. Population is increasing rapidly, as it is in the adjacent portions of Fremont and Teller Counties. There are areas of National Forest within the priority 3 zone and numerous areas of BLM public lands, though generally smaller and scattered.

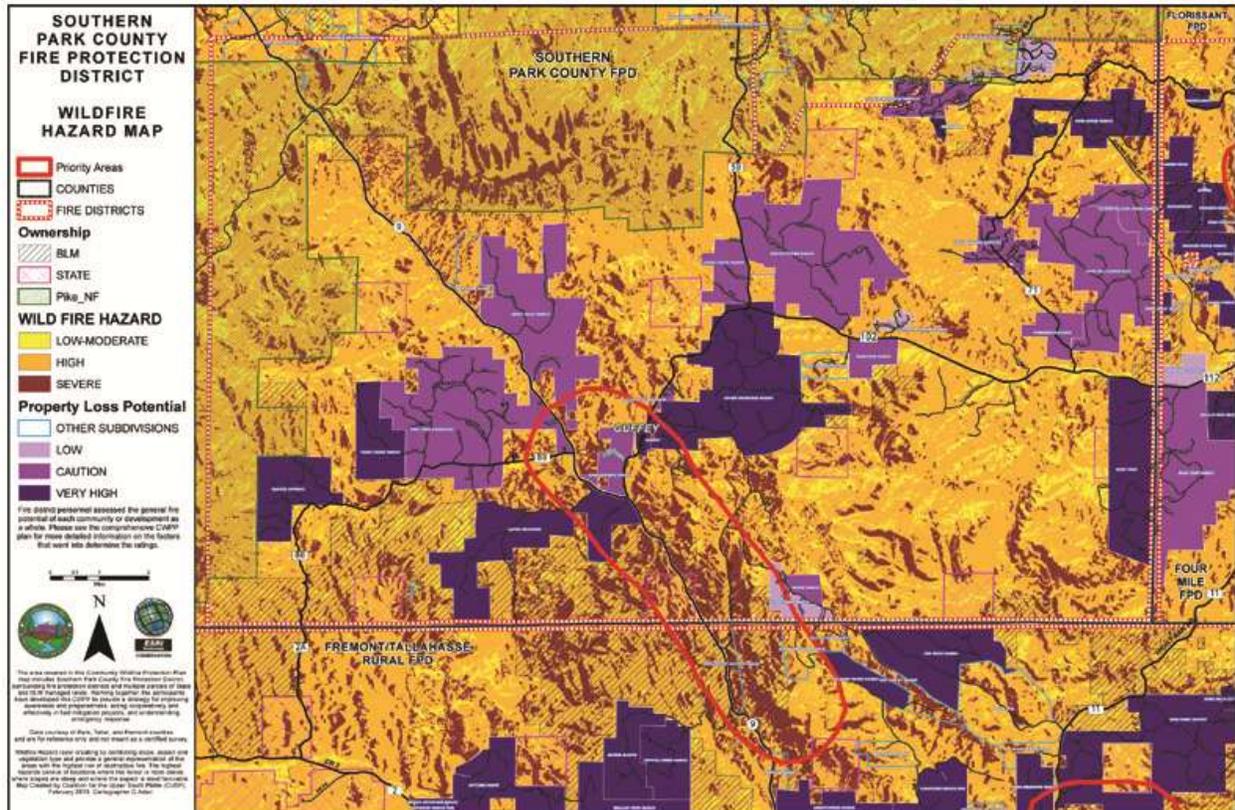


Priority Three – Guffey Area indicating wildfire hazard ratings from low to high (1-9)

Reprinted from the 2007 Park County CWPP

As an all-volunteer fire department, there are limitations in the response time and fire suppression capabilities in this district. Fire District coverage in Park County is optional. Property owners may choose to belong to the fire district and pay the associated taxes. The charges for the SPCFPD response to property not belonging to the District are \$250.00 per hour, per vehicle, one hour minimum.

Public safety will be the highest priority. In the event of a wildland fire, several of the communities have only one way in or out. There are few evacuation routes - narrow, two lane roads that are flanked by forest fuels in many locations. Again, property protection lies in the hands of the property owner. Over 3/4 of the communities are at significant risk for property loss and over 1/4 are at very high risk.



The areas adjacent to Highway 9 including the town of Guffey are considered the highest priority in this fire district. Due to terrain and prevailing winds, the potential for embers to be blown onto the highway and into the town igniting spot fires is high. Closure of this route due to wildfire would seriously impact any evacuation efforts from nearby subdivisions and put many at greater risk. Much of the road frontage is managed by the BLM.

Recommendations:

#1 Resident using this travel corridor and within Guffey should create an effective evacuation plans with the assistance of the fire department.

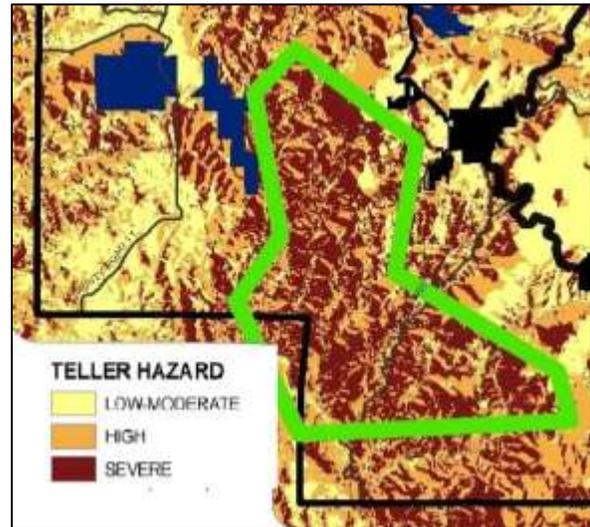
#2 The BLM should identify this highway corridor as essential to public safety and to any fire suppression efforts necessary in this area. Fuel reduction activities using best management practices should focus along this corridor.

#3 Property owners should reduce the fuels within 100 feet of the structure and along access routes. Those not included in the fire district should consider adding that protection as well.

#4 Water supplies are very limited throughout this district and negatively impact fire department response time and capabilities. Communities should investigate and install water cisterns for use in fire suppression. More information is available at your fire department.

Property Loss Assessment: Four Mile Fire Protection District, Teller County

The 2005 Teller County CWPP was updated in 2011 and identifies an area of the Four Mile FP District as a second tier priority. Numerous subdivisions are located in or near to this area and within this targeted CWPP. These subdivisions were evaluated for wildfire hazards in the original plan completed in 2005, and are included in Appendix A. These ratings were reviewed by the Four Mile Fire Department for this CWPP and the ratings are consistent with current evaluations. The current hazard map is on the following page.



High Priority subdivisions include: Highland Meadows, Lakemore West and Cripple Creek Mountain Estates. All of the subdivisions considered to be high priority have dangerous fuel conditions both inside and around subdivision boundaries.

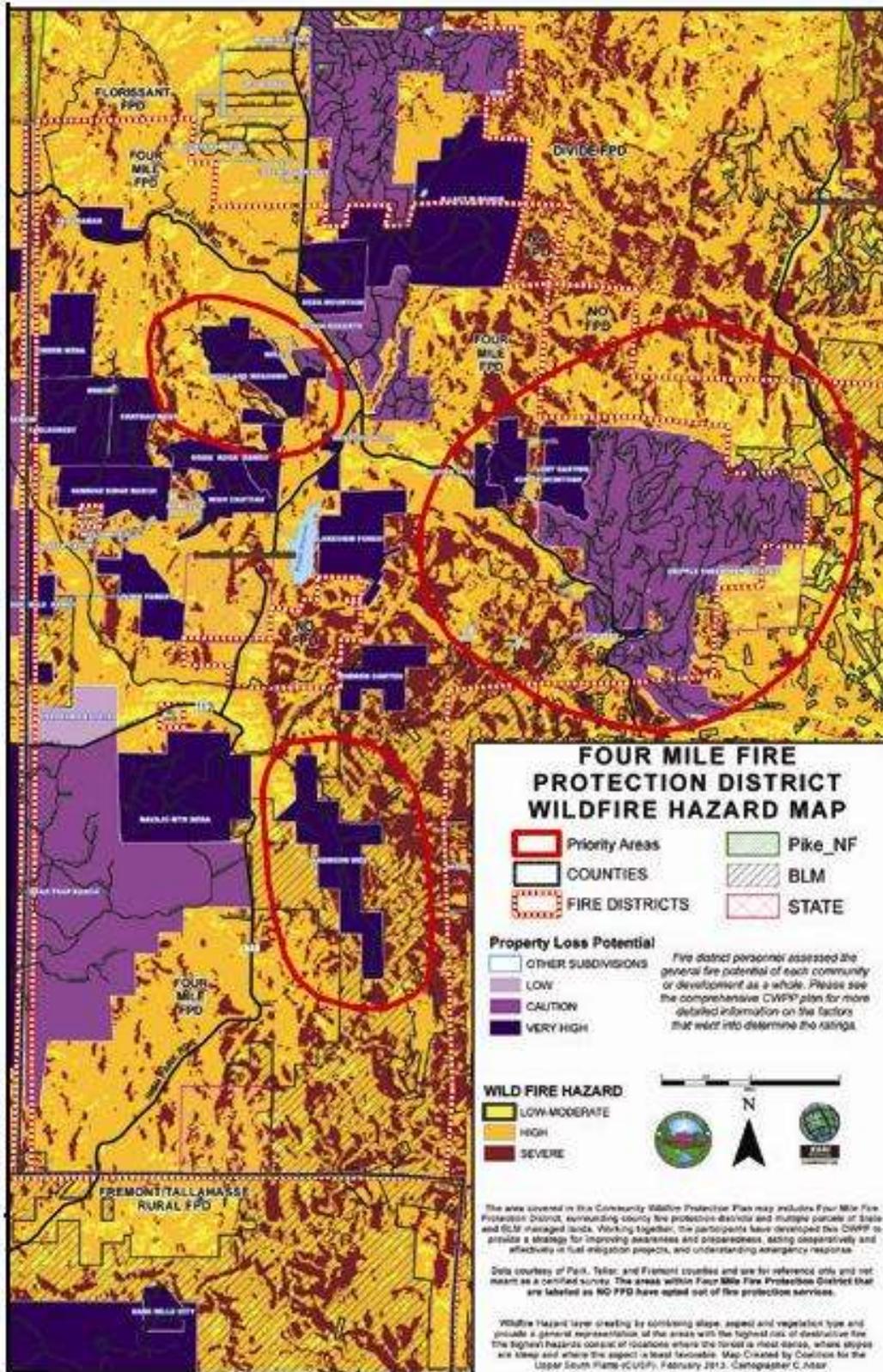
Recommended Actions:

#1 Within the subdivision, defensible space should become a high priority action by all residents. Community actions can greatly reduce the risk. Reduction of fuels that can carry the fire to the structure will also allow safe action by fire department personnel to protect the structure from ignition.

#2 Subdivisions should investigate the installation of water storage cisterns that hold a total of 30,000 gal of water to use for fire suppression activities in locations recommended by the fire department. Many ponds in the area have either gone dry due to drought, or been removed. Available water supply is a critical factor in structure fire suppression.

#3 These high priority subdivisions have only one access road or lengthy routes in and out. These subdivisions should all create an evacuation plan with the assistance of the fire department. They should also investigate acquiring a secondary emergency egress.

#4 Where public land managers have jurisdiction along subdivision boundaries, areas adjacent to these subdivisions should be given priority for fuel reduction treatments by appropriate methods.



Prevention and Mitigation of Catastrophic Wildfires

Wildfire Suppression and Capabilities

Contrary to popular belief, wildfires are not “put out” by fire crews or air attack. The goal of wildland firefighters is to reduce and remove the fuels so the fire cannot proceed and burn out. Creating fire lines and fuel breaks is an effort to contain or restrict the fire’s movement. Aerial slurry or water applications are used to slow the fire’s advance and improve the safety of the men and women fighting the fire on the ground. Consequently, a wildfire is “contained”, and the fire’s progression is stopped. A majority of fuel inside that line will continue to burn and it may be months before the fire is considered “out”.

Though the focus is on a much smaller area, structure protection during a wildland fire is not too different. The goal is to remove or reduce the fuels surrounding the home and keep the fire’s path away from the structure. Often, the materials of the home itself can become fuel for the fire. Embers or fire brands pose a serious threat even when the main fire is some distance away. Because this is private property, the responsibility for prevention is in the hands of the homeowner. A properly prepared home is much easier to protect and defend and is more likely to survive a wildland fire. (See www.Firewise.org for more detailed information.)

Personal Responsibility

In the words of Smokey Bear, “only you can prevent wildfires.” In the context of this CWPP, those words mean that the reduction of the fire risk to structures and vegetation on private property is the owner’s responsibility. That responsibility includes managing wildland fuels within the first 100 to 200 feet surrounding any structure on the owner’s property. It has been demonstrated repeatedly that the greatest fire threat to a structure occurs within that area.³

When a tree ignites, flames can race up the trunk at up to 75 miles an hour. Burning material is literally stripped away and hurled into the air where winds can carry it far downwind. Multiplying this process by dozens or even hundreds of trees can produce a blizzard of firebrands that literally fill the air. These embers can pile up on top or under a deck, in corners or indentations outside a house, even on exterior windowsills, like drifts of snow. They also can settle on roofs, accumulate there and burn through a flammable roof or drop down onto a flammable deck. When enough embers accumulate, the house catches fire.

Whether a house ignites during a wildfire depends on its design, the materials used in its exterior construction, including its roof, and the amount of heat to which it is subjected. The materials of construction and the nearby fuels, such as wooden decks, stored firewood, dry grass and trees, determine whether embers will ignite a house during a wildfire. By the time a fire threatens, it’s too late to do much about these factors. They should be addressed before a fire season begins. Protective measures might include renovations to the house itself, such as replacing a flammable roof with a fire resistant one. The Fire Science Lab summarized the primary lessons learned from the 2010 Fourmile Canyon Fire in boulder, Colorado, as follows:

³ “Reducing the Wildland Fire Threat to Homes: Where and How Much?” Jack D. Cohen, USFS, General Technical Report, PSW-GTR-173, 1999. <http://www.treearch.fs.fed.us/pubs/5603>.

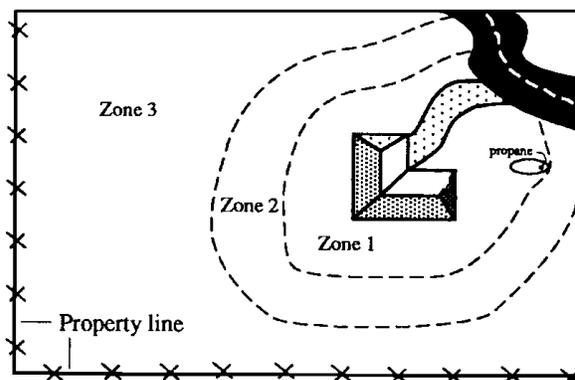
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- Eliminate all flammable materials (potential fuels) within 10 feet of the house.
- Consider any wood roof to be flammable; wet the whole roof frequently when flying embers are threatened.
- Remove flammable materials from decks or boardwalks – if it's connected to the house, consider it part of the house.
- Remove dead leaves and pine needles from gutters and the roof.
- Staple metal window screening over any openings or gaps including low decks, walkways and crawl spaces.
- If possible, place sprinklers to wet the area around the house, especially within 60 feet of the house.
- Reduce or eliminate surface fuels, including cutting the grasses, starting at the house to within 100 feet of the house, and prune lower limbs of trees to at least 8 feet above the ground.

Survivable Space and Structure Vulnerability

Creation of Survivable Space

The first defense of a home or other structure against wildfire is to create and maintain a survivable space (also called defensible space) within 100 to 200 feet of the structure and along the driveway. This does not mean the survivable landscape must be barren. Survivable space is an area around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire toward or away from the structure. Survivable space also provides room for firefighters to safely do their jobs. A house is more likely to survive a wildfire if nearby grasses, brush, trees and other forest fuels are managed to reduce a fire's intensity long before there is a fire. The survivable space should also be clear of man-made hazards such as stacks of firewood. The Colorado State Forest Service has described the key steps to creating a survivable space.⁴



Slash Disposal

A problem encountered by property owners in creating survivable space or otherwise thinning their forests is disposal of the slash, i.e., the debris created by the felling or the trimming of trees and brush. The term also includes dead and down trees. Chipping, lop and scatter, and mastication (shredding) are common methods of treating slash that return the nutrients of the wood to the forest floor. Pile burning is another method of slash disposal, although it is not recommended. Done incorrectly, these fires run the risk of starting a wildfire within the community and may cause long-term damage to the soil. Owners must have a burn permit and check for all fire bans before using this option.

⁴ "Defensible Space," CSFS Website <http://csfs.colostate.edu/pages/defensible-space.html>.

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Reduction of Structure Vulnerability

Fire research has demonstrated that a crown fire exposes a structure to intense heat of for 90 seconds or less. This is sufficient time for the heat of such a fire to ignite the structure. Anecdotal evidence, confirmed by post-fire damage assessment studies conducted by the National Institute of Science and Technology (NIST), suggests that wind-driven firebrand attack is another source of structure ignition. There are many ways to reduce the vulnerability of structures to wind driven embers and these are outlined in CSFS documents.⁵ The measures include the use of fire resistant roofing materials, storing firewood away from structures, use of fire resistant decking, installation of screens to prevent buildup of embers under porches or decks, and use of vent screening and chimney caps.

Fuels Treatment

Forest Restoration

Restoration is a form of fuels treatment wherein the forest is returned to its historic (pre-settlement) condition. Knowing how a site once looked is an important tool in setting management goals and strategies for forest restoration. Restoration treatments seek to lower fire danger while increasing the overall biological diversity and long-term health of treatment areas. Restoration treatments might involve mechanical thinning to remove excess trees and removal of ladder fuels to reduce the likelihood that a surface fire will become a crown fire. Such treatments also include increase in the distance between tree crowns, which makes it more difficult for a crown fire to spread through the canopy.

The purpose of restoration treatments is to not only alter forest structure for the short term, but also to bring about long term change to the forest function in the ecosystem. For that reason, they have the potential to provide a long-term solution to wildfire threats, which are really only a symptom of a larger problem, i.e., an unhealthy ecosystem. The CSFS has provided guidance on restoration treatments.⁶

Forest Thinning

Thinning the dense stands of trees that exist throughout Colorado would reduce the risk of catastrophic wildfires and improve forest health. Numerous thinning prescriptions have been implemented, primarily on public lands, but thinning within subdivisions also is beneficial. Many mitigation treatments on private property focus solely on removal of ladder fuels and reducing crown connectivity.

In the simplest situation, chainsaws are used to remove lower branches or entire trees and to clear dead and down trees. In larger and more complex projects, mechanized equipment might be used. The cut wood is harvested for use as logs, posts or fuel; chipped or shredded for forest

⁵ "Firewise Construction: Design and Materials," CSFS Website, http://csfs.colostate.edu/pdfs/construction_booklet.pdf.

⁶ "Forest Restoration," CSFS Website, <http://csfs.colostate.edu/pages/forests-restoration.html>.

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mulch; or burned at a controlled site. The Internet has information on tools used for thinning.⁷

Firebreaks and Fuel Breaks

Firebreaks and fuel breaks are two different management techniques used to improve the ability to suppress wildfires, though the terms are often confused. A firebreak is a complete gap in vegetation or other combustible material that is at least 30 feet wide and acts as a barrier to slow or stop the progress of a wildfire. A firebreak may occur naturally where there is a lack of vegetation or fuel, such as a waterway, lake or rock outcrop or be man-made including roadways and logging trails.

The width of the roads in the subdivision plus 10 feet of clear space on either side would provide firebreaks throughout the community. Alternatively, this approach could be used in the near term to improve firebreaks in areas of the subdivision with high and extreme risk of wildfire, as depicted in Section 4.5.3, above. This alternative is one of the high priority actions identified in Chapter 7, below.

A fuel break is a natural or manmade change in fuel characteristics, which affects fire behavior so that fires burning into them can be more readily controlled. A man-made fuel break typically is 200-300 feet wide (or more on steeper terrain) and involves thinning to separate tree crowns, reduction of understory fuels, and removal of tree branches to a specified height, usually 8-10 feet above the ground, to keep fire from climbing into the tree tops. Fuel breaks commonly cross multiple property lines to provide a measure of protection to areas larger than a single property.

Prescribed Burns

The decision to use fire as a tool in forest management is a complicated process undertaken by fire management professionals. Among forest managers, carefully planned “prescribed” use of fire is considered a “Best Management Practice” for certain large acreage forest treatments. These fires help maintain and restore fire dependent ecosystems by imitating the vegetative disturbance of periodic natural fires. In addition to considering the basic elements of fire behavior (fuels, terrain and weather) in designing a prescribed burn, forest and fire managers take into account the wildlife habitats, soils, historical or cultural impacts, air and water quality, and safety. Planning is a long-term process and unless all conditions of the prescription are met, no planned ignition will occur.

⁷ “Safe Chainsaw Operation,” A. Scott Reed, Jack True, University of Minnesota Extension, <http://www.extension.umn.edu/distribution/naturalresources/dd2487.html>; “Chipper Shredder,” Manufacturers Website, <http://www.chippershredders.net/>.



The benefits of prescribed burns can be seen in this photo. The Polhemus Fire near Deckers, Colorado was a prescribed burn in October 2001 conducted by the USFS. Treatment included forest thinning followed by a prescribed “broadcast burn” of ground fuels. Eight months later, the Hayman fire burned uncontrolled through tree crowns to the boundary of the Polhemus burn where it dropped to a ground fire and burned out. The USFS has published guidelines and procedures for prescribed burns.⁸

⁸ “Interagency Prescribed Fire Planning and Implementation Procedures Guide,” USFS Website, <http://www.fs.fed.us/fire/fireuse/rxfire/rxfireguide.pdf>.

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Summary

Scientific examination of the wildfire risk factors in the Four Mile-Currant Creek Headwaters demonstrates several wildfire fire hazard areas in need of mitigation. The priority areas are focused on concentrations of structures and high priority routes essential to daily commerce and public safety.

The highest priority of this committee is to spotlight the necessity of residents in this area to take the personal responsibility to reduce the hazards on their property. Actions taken to reduce the vegetative fuels and to keep wildfire at least 50 feet away from structures greatly increases the personal safety and fire suppression success of fire fighters. Additionally, every resident and community should prepare an emergency action and evacuation plan.

In this dry climate, not only does the potential for catastrophic fire increase, so does the need for reliable water supplies for structure fire suppression. Without an adequate nearby water supply (30,000 gallon supply is recommended) valuable time is lost in structure fire protection. A small fire can quickly become a catastrophic fire causing damage and harm throughout communities. The installation of water cisterns will increase the success of suppression efforts for community protection.

Forest management on public lands to reduce the risk of wildfire and improve forest health will also help to protect area residents from wildfire impacts. Priorities of these projects should be focused on areas adjacent to communities at risk and protection of travel corridors. Cooperation of residents will increase the success of these treatments.

For more information about this document and steps to reduce your risk, please contact your fire department, or Colorado State Forester (CSFS):

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Appendix A: Subdivision and Community Hazard Assessment

Subdivision	FPD	Crown Fire Hazard	Property Loss Hazard
Alpine Vale	4 Mile	High	13 Very High 37
B Lazy M	4 Mile	High	14 Very High 25
Bear Trap Ranch	4 Mile	High	14 Caution 23
Chateau West 1,2	4 Mile	High	13 Very High 26
Creskide Estates	4 Mile	Low	7 Low 16
Cripple Creek Mtn Estates	4 Mile	High	13 Caution 21
Cripple Creek Timbers	4 Mile	High	14 Very High 40
Dear Mountain	4 Mile	Caution	10 Very High 28
Dome Rock	4 Mile	Caution	10 Very High 28
Eagle Crest 1-3	4 Mile	Caution	10 Very High 29
Four Mile Ranch	4 Mile	High	13 Very High 37
Hidden Canyon	4 Mile	High	14 Very High 36
High Chateau 1,2	4 Mile	High	13 Very High 27
Highland Meadows	4 Mile	High	13 Very High 33
Lakemoor West	4 Mile	High	13 Very High 28
Lakeview Forest	4 Mile	Very High	20 Very High 35
Living Forest Estates	4 Mile	Caution	11 Very High 34
Lost Canyon 1,2	4 Mile	Very High	20 Very High 42
Navajo Mtn Mesa	4 Mile	High	13 Very High 29
Panoramas Unlimited	4 Mile	Caution	10 Very High 28
Ranch Resorts	4 Mile	Caution	10 Caution 21
Sunrise Ridge Ranch	4 Mile	Caution	11 Very High 32
Timber Mesa	4 Mile	Caution	11 Very High 39
Western Hills	4 Mile	Low	6 Very High 35
Aspen Creek Ranch	Southern Park	Low	7 Caution 18
Aspen Meadows	Southern Park	Very High	17 Very High 28
Aspen point Ranch	Southern Park	Low	5 Low 12
Bear Trap Ranch	Southern Park	High	14 Very High 30
Beaver Springs	Southern Park	Very High	20 Very High 30
Beebe Ranch	Southern Park	Low	5 Caution 24
Castle Mountain Ranch	Southern Park	Caution	9 Low 17
Cover Mountain	Southern Park	Very High	17 Very High 25
Deer View	Southern Park	Caution	10 Very High 27
Fourmile Ranch	Southern Park	Low	7 Very High 30
Fourmile Ranch 2000	Southern Park	Caution	11 Caution 23
Guffey, Town of	Southern Park	Low	5 Low 17
Latasha Subdivision	Southern Park	Very High	17 Caution 21
Many Hills	Southern Park	High	14 Caution 24
Old Kathleen Ranch	Southern Park	Caution	10 Caution 19
Olsen's Slater Creek Ranch	Southern Park	Low	6 Caution 21
Paris Creek Ranch	Southern Park	High	14 Very High 28
Paris Creek Ranch Estates	Southern Park	High	14 Caution 22
Park Ridge Ranch	Southern Park	Very High	17 Very High 32
Pike Meadow Estates	Southern Park	Low	5 Caution 19
Pike Trails Ranch	Southern Park	Caution	10 Caution 21

Appendix A: Subdivision and Community Hazard Assessment

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Subdivision	FPD	Crown Fire Hazard		Property Loss Hazard	
Ponderosa Ranch	Southern Park	High	14	Caution	20
Saddles Mountain Heights	Southern Park	High	13	Caution	20
Saddles Mountain Ranch	Southern Park	Low	5	Low	17
Soda Springs Ranch	Southern Park	Very High	17	Caution	19
Soda Springs Ranch	Southern Park	Very High	17	Caution	19
Teaspoon Ranch	Southern Park	Caution	10	Caution	19
12 Mile Park	Tallahassee	Low	6	Very High	40
Alpine Bluffs	Tallahassee	Caution	12	Very High	44
Autumn Creek	Tallahassee	Caution	12	Very High	44
Bar J	Tallahassee	Caution	12	Very High	28
Bare Hills City	Tallahassee	Caution	10	Very High	43
Bighorn Sheep Ranch	Tallahassee	Low	6	Very High	44
Cabin Creek	Tallahassee	Caution	12	Very High	44
Canyon Springs	Tallahassee	Caution	12	Very High	39
Cap Rock	Tallahassee	Low	6	Very High	39
Christopher Ranch	Tallahassee	Caution	12	Very High	35
Cottonwood Ranch	Tallahassee	High	14	Very High	38
Crystal Pines	Tallahassee	Caution	12	Very High	50
Currant Creek	Tallahassee	Low	6	Very High	29
Deer Haven	Tallahassee	Caution	12	Very High	40
Deer Park	Tallahassee	Caution	12	Very High	40
Delilah Peak	Tallahassee	Caution	12	Very High	39
Double Creek Ranch	Tallahassee	Low	3	Very High	28
Elkview	Tallahassee	Caution	12	Very High	30
Gardner Peak	Tallahassee	Caution	12	Very High	40
Hall Gulch	Tallahassee	Caution	12	Very High	47
Harrison Ranch	Tallahassee	Low	3	Very High	32
High Park	Tallahassee	Low	6	Very High	36
King Meadows	Tallahassee	Low	6	Very High	34
Longhorn	Tallahassee	Low	6	Very High	42
Parkdale	Tallahassee	Caution	12	Very High	34
Pine Vista	Tallahassee	High	15	Very High	52
South T-Bar Ranch	Tallahassee	Caution	12	Very High	28
Tallahassee Trails	Tallahassee	Caution	12	Very High	38
Waugh Mountain	Tallahassee	Caution	12	Very High	46
Whiskey Park	Tallahassee	Caution	12	Very High	50
Woodlands	Tallahassee	High	15	Very High	50
		Crown			Property
		Low 5-7	3to 7	Low	< 10
		Caution	9 to 12	Caution	11 to 17
		High	13 to 15	High	18 to 24
		Very High	16-22	Very High	25 to 71

SUBDIVISION HAZARD ASSESSMENT FORM

Name of Subdivision: _____ Date: _____
 County: _____ Size (AC): _____ # Lots: _____
 Rating: _____ Comments: _____

A. SUBDIVISION DESIGN

1. Ingress/Egress:
 - Two or more roads, primary route
 - One road, primary route, plus alternative
 - One way in/out
2. Primary Road Widths:
 - Minimum 24 ft.
 - Less than 24 ft.
3. Accessibility:
 - Smooth road, grade less than 5%
 - Rough road, grade less than 5%
 - Other
4. Secondary Road Terminus:
 - Loop road or cul-de-sacs w/turn-around radius greater than 45 ft.
 - Cul-de-sac turnaround radius less than 45 ft.
 - Dead-end roads less than 200 ft. in length
 - Dead-end roads over 200 ft. in length
5. Average Lot Size:
 - More than 10 acres
 - Between 1 and 10 acres
 - Less than 1 acre
6. Street Signs:
 - Present
 - Not Present

B. VEGETATION

1. Fuels/Density (General):
 - Grass w/scattered trees or oak brush
 - "Thinned" Conifers (10 ft or more between trees)
 - Sagebrush/willow
 - Moderately dense conifers or oak brush
 - Dense, continuous conifers and/or thick oak brush
2. Defensible Spaces Completed:
 - More than 70% of sites
 - Between 30 – 70% of sites
 - Less than 30% of sites

C. TOPOGRAPHY

1. Slope (Predominant):
 - Less than 8% 1 _____
 - Between 9 – 20% 4 _____
 - Between 21 – 30% 7 _____

D. FIRE PROTECTION

1. Response Time:
 - Within 15 minutes 1 _____
 - Within 16 – 30 minutes 5 _____
 - Greater than 31 minutes 10 _____
2. Hydrants:
 - 500 gpm hydrants on less than 1,000 ft spacing 1 _____
 - Hydrants, but less than above or pump-site available on-site. 2 _____
 - No hydrants or pump-site 3 _____
3. Draft Sources:
 - (Complete only if no hydrants or pump-site available)
 - Draft sources within 20 minutes round trip 1 _____
 - Draft sources within 21-45 minutes round trip 5 _____
 - Draft sources greater than 46 minutes round-trip 10 _____

E. STRUCTURE HAZARD

1. Materials (Predominant):
 - Roof and siding materials non-wood 1 _____
 - Flammable siding/non-flammable roof (includes mobile home) 5 _____
 - Flammable roof 10 _____

F. UTILITIES (Gas and/or Electric)

1. Placement:
 - All underground 1 _____
 - One underground, one aboveground 3 _____
 - All aboveground 5 _____

TOTAL FOR SUBDIVISION

Low Hazard	0 – 29
Moderate Hazard	30 – 39
High Hazard	40 – 48
Severe Hazard	49 – 59
Extreme Hazard	60 +

APPENDIX B: REFERENCE INFORMATION

Information Sources for Reducing Subdivision Risks

There are many sources for finding additional information about methods and resources for community and structure protection. These include the Office of Emergency Services in each county, the Colorado State Forest Service Offices in Woodland Park and Canyon City, the US Forest Service, and the National Fire Protection Association's Firewise program.

The following websites contain a wealth of information on fire risk reduction and protection.

<http://www.firewise.org/>

<http://www.colostate.edu/Depts/CSFS>

<http://www.healthyforests.gov/community/cwpp.html>

<http://www.fireplan.gov/>

http://www.fs.fed.us/fire/prev_ed/index.html

<http://www.fireadapted.org/>

Colorado State Forest Service: State Foresters are able to provide management assistance and fire protection for much of the nation's private forestland. Private landowners interested in learning more about natural resource protection and educational programs such as forest stewardship can contact their Service Forester at the following website:

www.stateforesters.org.

U.S. Department of Agriculture: Along with state agricultural colleges, the U.S. Department of Agriculture works to develop educational materials, demonstrations, and workshops to provide landowners with information of forest ecology and natural resource management and protection. The Colorado State Extension Forestry office can be contacted at: Colorado State University, Department of Forest Science, 100 Natural Resources Lab, Fort Collins, CO 80523; (970) 491-7780.

Firewise Program: The Firewise Program is sponsored by the National Association of State Foresters, and it provides information for homeowners who live in or adjacent to wildland fuels. The website is: www.firewise.org.

Southern Rockies Conservation Alliance: This program offers neighborhoods with information, possible funding opportunities and mitigation project assistance. Contact John Chapman, Wildland Fire Coordinator, for more information at (303) 650-5818 x113. The website is: www.southernrockies.org.

Institute for Business and Home Safety: The Insurance Institute for Business & Home Safety's mission is to conduct objective, scientific research to identify and promote effective actions that strengthen homes, businesses, and communities against natural disasters and other causes of loss. The IBHS has done extensive research on cause and prevention of home ignition during wildland fires. <http://disastersafety.org/wildfire/regional-wildfire-retrofit-guides>