



# HIGH FOREST RANCH

## Community Wildfire Protection Plan

March 31, 2014

Prepared By

High Forest Ranch Fire Mitigation Committee

And

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In Cooperation With:

Black Forest Fire Rescue Protection District  
Donald Wescott Fire Protection District

El Paso County Sheriff's Office of Emergency Management  
Colorado State Forest Service

## ACCEPTANCE

The High Forest Ranch Community Wildfire Protection Plan (CWPP) was developed in accordance with the guidelines set forth by the Healthy Forests Restoration Act of 2003 and the Colorado State Forest Services' Minimum Standards for CWPP's.

This CWPP is a collaborative effort to guide our stewardship management activities, including wildfire protection. The activities recommended in this plan are appropriate to meet our objectives and will benefit the natural resources and reduce the risk from wildland fire. This plan is voluntary, and where possible, we intend to apply the recommended practices, thus improving our community and increasing public safety.

The High Forest Ranch Community Wildfire Protection Plan has been reviewed and approved by the Members of the CWPP Committee.

\_\_\_\_\_  
President  
**High Forest Ranch Home Owners Association**  
\_\_\_\_\_

\_\_\_\_\_  
Date

\_\_\_\_\_  
Chair, El Paso County Board of County Commissioners

\_\_\_\_\_  
Date

\_\_\_\_\_  
ATTEST

\_\_\_\_\_  
Larry Long, District Forester  
Colorado State Forest Service

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Date

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Fire Chief, Black Forest Fire Rescue Protection District

\_\_\_\_\_  
Date

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Fire Chief, Donald Wescott Fire Protection District

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Date

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## Foreword

The experience of the last several fire seasons, sustained drought conditions and ever increasing number of homes constructed in the Wildland-Urban Interface (WUI) make future wildfires in High Forest Ranch (HFR) and El Paso County forested areas, a near certainty. All residents and property owners of the High Forest Ranch community have a responsibility to understand their linkage to their personal safety, that of their neighbors and our firefighters.

With future fires a near certainty, it is vitally important that each individual home and property owner understand and apply principles and guidelines in the Colorado State Forest Service Publication Wildfire Defensible Spaces, FIRE 2012-1, and other Firewise recommendations found at [www.firewise.org](http://www.firewise.org). However, principles, standards and techniques in various wildfire publications are useless without a key factor- the human will to make a change in the WUI environment.

To make this change, three key principles can be examined: Community, Consensus, and Collaboration, or, the three C's.

### Community:

- ❖ Responsibility- individual and collective.
- ❖ Entire areas mitigated and forests restored to healthy conditions.
- ❖ Overall reduction in unnatural fuel volumes.
- ❖ Risk Management as opposed to an unrealistic expectation of risk elimination.

### Consensus:

- ❖ Standards for fuel reduction intended to protect High Forest Ranch.
- ❖ Adoption of an overall Plan (CWPP) to address/manage wildfire risks.
- ❖ Breaking through deeply held cultural values and beliefs that prevent HFR from becoming more adapted to fire as a natural part of the ecosystem.
- ❖ Definition of a healthy forest, using the best science available, and development of an acceptable "aesthetic" based on this science.
- ❖ Wildfires will happen. It is not a matter of "if", but "when".
- ❖ There are no guarantees with wildfire due to many variables; both human and natural.

### Collaboration:

- ❖ Partnering with organizations that can have an impact on the life, property and natural resources of High Forest Ranch.
- ❖ Working together to take advantage of any outside financial assistance or programs.
- ❖ Empathy with different standards.
- ❖ Getting past "no" and/or willful ignorance.

The Three C's are vital to building common interest, understanding and action; and necessary to protect the values that make High Forest Ranch unique.

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## Introduction

High Forest Ranch (HFR) was impacted by the 2013 Black Forest Fire. The fire started on June 11<sup>th</sup> and burned into HFR on June 13<sup>th</sup>, pushed by high winds. Twelve lots were affected, with no homes lost. However, it should be noted sufficient protection resources were in place, and the fire front died down as evening fell. It is suspected the outcome would not have been the same if the fire had burned into the community on the first day. The presence of significant ladder fuels, in the form of ponderosa pine regeneration, and continuous unthinned forests could have spelled disaster. High Forest Ranch must still reduce its ladder fuels and increase tree crown separation to survive a high intensity wildfire.<sup>1</sup>

The community, in an effort to be proactive, has formed a Fire Mitigation Committee, initiated a slash disposal program, and achieved recognition as an NFPA Firewise Community. In late 2013, the committee and HFR board of directors interviewed and hired a forestry consultant to begin development of a Community Wildfire Protection Plan (CWPP). Objectives of the plan are:

- ❖ To protect life, property and natural resources of High Forest Ranch.
- ❖ To protect lifestyle and shared community values.
- ❖ To restore and protect the forests of High Forest Ranch.
- ❖ To protect homeowner access to affordable insurance.
- ❖ To reduce wildfire risks in High Forest Ranch.
- ❖ To develop partnerships with those that can have an influence on the wildfire risk to High Forest Ranch and its forest.
- ❖ To provide for the safety of firefighters and allow them to be more effective in protecting us.

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<sup>1</sup> Black Forest Fire Assessment Report. Pikes Peak Wildfire Prevention Partners, 2014, [www.ppwpp.org](http://www.ppwpp.org)

## The CWPP Process

The minimum requirements for a CWPP as described in the Healthy Forest Restoration Act of 2003 are:

1. **Collaboration:** A CWPP must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.
2. **Prioritized Fuel Reduction:** A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect one or more at-risk communities and essential infrastructure.
3. **Treatment of Structural Ignitability:** A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.<sup>2</sup>

The CWPP process will cover:

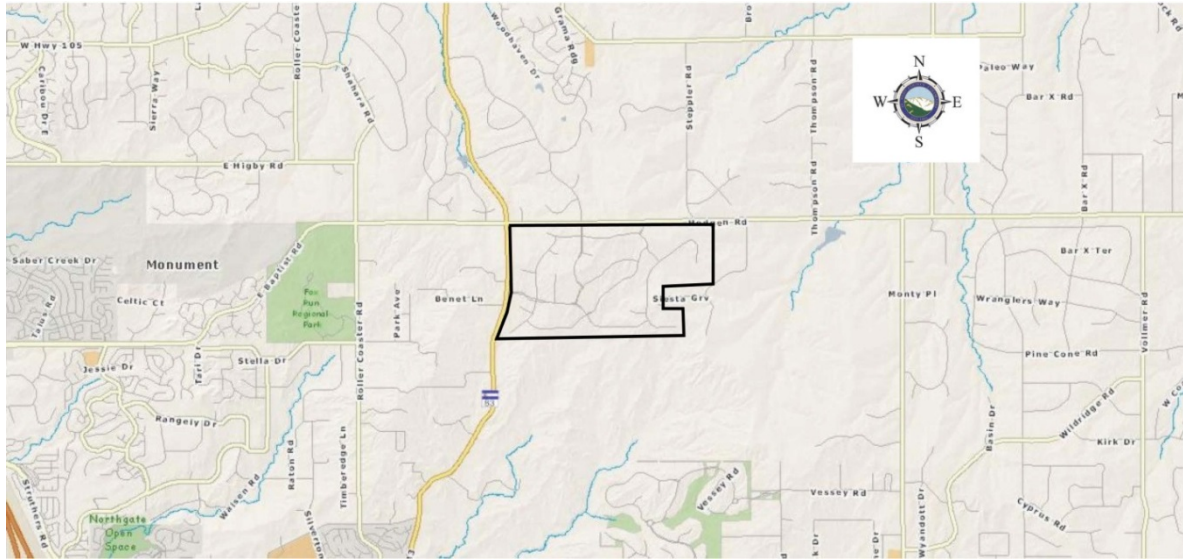
- ❖ **Assessment:**
  - Carry out a general community assessment and an analysis of community fire mitigation capacity;
- ❖ **Education and Preparedness:**
  - Develop community education and preparedness initiatives about wildfire behavior and mitigation;
- ❖ **Mitigation planning**
  - Engage in community wildfire mitigation planning;
- ❖ **Implementation**
  - Implement risk reduction and community protection activities;
- ❖ **Monitoring and Sustainability**
  - And commit to project implementation monitoring and building sustainable community capacity.

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<sup>2</sup> Preparing a Community Wildfire Protection Plan, National Association of State Foresters, et al, March 2004.

## COMMUNITY IDENTIFICATION AND DESCRIPTION

### Location and General Description

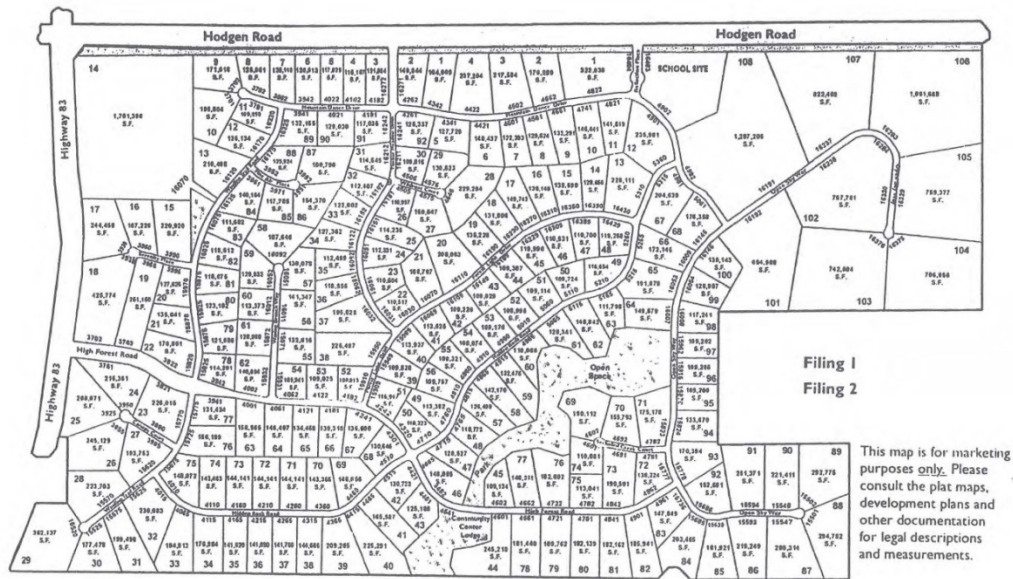


**Vicinity Map showing location of High Forest Ranch**

High Forest Ranch is located in the northeast portion of unincorporated El Paso County, Colorado. The 1,000 acre community was subdivided into 200 lots, with the initial filing started in 2001. Lot sizes range from 2.5 to 39 acres. At the time of CWPP adoption, 165 homes have been constructed, three homes are in the construction phase, and over 30 vacant lots are available for construction.

High Forest Ranch is located in **Township 11 South; Range 66 W of the 6<sup>th</sup> Prime Meridian**, and the latitude and longitude at the center of the community is **39° 3.828' N, 104° 45.182' W**.





### High Forest Ranch Plat Map

Two lot types were developed. The majority of the lots are forested. The second type of lots is equestrian properties, generally in prairie sections of HFR.

Private land abuts the south and east portions of HFR. Colorado State Highway 83 abuts the western edge. Hodgen Road abuts the north boundary and is owned by El Paso County. No other public ownerships abut HFR.

### High Forest Ranch Community (from HFR Website)



The following is an excerpt from the HFR web site:

*“At High Forest Ranch the residents are guests of nature where you can easily be at home in the country while working in the city. **Located only 15 minutes from downtown Colorado Springs and 45 minutes out of Denver**—you really can have it all.*

*At High Forest Ranch, we see the value in space and beauty and privacy, while offering home sites ranging from 2.5 to 39 acres. **We pride ourselves on a close neighborhood community.** We utilize the community lodge for various community events from our annual wine tasting party and monthly happy hours to our holiday party and summer BBQ.*

*Adopting the theme of a "national park setting," The Lodge at High Forest Ranch blends effortlessly into nature and is for all residents to use for private parties.*

*The deck offers breathtaking views of Pikes Peak and features an outdoor gas fire pit. A playground is situated in the back along with a sports court for an invigorating round of two on two, and a short distance away is the stocked fishing pond perfect for catch and release or an after dinner stroll.”*

2014 Updated Mission and Priorities for High Forest Ranch:

### **Mission**

- ❖ To sustain and enhance the HFR community atmosphere, safety, value and environment.
- ❖ To ensure effective, open, transparent communication within the community in order to represent community interests.
- ❖ To foster community participation and spirit.
- ❖ To ensure fair, impartial and well communicated enforcement of covenants
- ❖ To identify and ensure progress on priority projects.
- ❖ To provide effective planning for future projects and a sustainable HFR budget.

### **Priorities**

- ❖ Clear Governance standards, written records and actions in accordance with stated Mission
- ❖ Fire Mitigation
  - Slash Cleanup Project
  - CWPP
  - Firewise Community Status
- ❖ Budget Sustainment
  - Reserve Study Update for Major Expenditures/Roads
- ❖ Landscape
  - Trail Sustainment, Medians/Islands Enhancement
- ❖ Provide a rapid and fair process for new construction/landscape review
- ❖ Improve safety, security, appearance, and value of our community

## **COMMUNITY ASSESSMENT**

### **Community Values at Risk**

The number one asset of HFR is the forest. This asset provides two values. The first is the aesthetic value. The second value, property value, is directly related to lot costs and home resale values for forested properties. Other less tangible values include wildlife habitat, view corridors, and privacy.

High Forest Ranch is a gated community with controlled access. This includes the private road system, owned by HFR Homeowners Association. HFR-HOA assets include:

- ❖ The Lodge Community Center
- ❖ Three gated entries with monumentation and landscaping.
- ❖ Roadways within 134.93 platted acres.
  - Street lights
  - Street signs
  - Mail box units
  - Culverts and roadside ditches
- ❖ Community Open Space and other land (35.06 acres)
  - Meadows
  - Cistern Sites
  - Pond sites
- ❖ Two water cisterns with dry hydrant systems
- ❖ Two water features with dry hydrant systems.
- ❖ Community trail system
- ❖ Drainage improvements including storm detention ponds.
- ❖ Electrical system
  - Below ground with above ground transformer and lot services
  - Overhead lines to the southwest and north boundary
- ❖ Utility pedestals for telephone and natural gas to individual lots.

### **Wildland Urban Interface Boundary**

The wildland urban interface (WUI) boundary is defined as the area where a wildfire would be a threat to the community. The boundary, shown as a red outlined area on the map below, was set at a distance varying from ½ to ¾ miles in areas abutting heavy

fuels. In areas with prairie fuels, the zone varies from 300 to 600 feet. Distances are based on embers generated in these zones that can impact HFR.<sup>3</sup>

Ninety-eight percent of wildfires are typically contained or controlled within the first or second burning period.<sup>4</sup> The Black Forest Fire fits into the remaining two percent of fires that exceeded the suppression capacity of fire service control due to extreme weather and fuel conditions. Most of the homes and structures were lost during this “convergence of conditions” of fuel, weather and topography within the first 24 hours of the fire.

Other observations of the fuels in the zone surrounding HFR are:

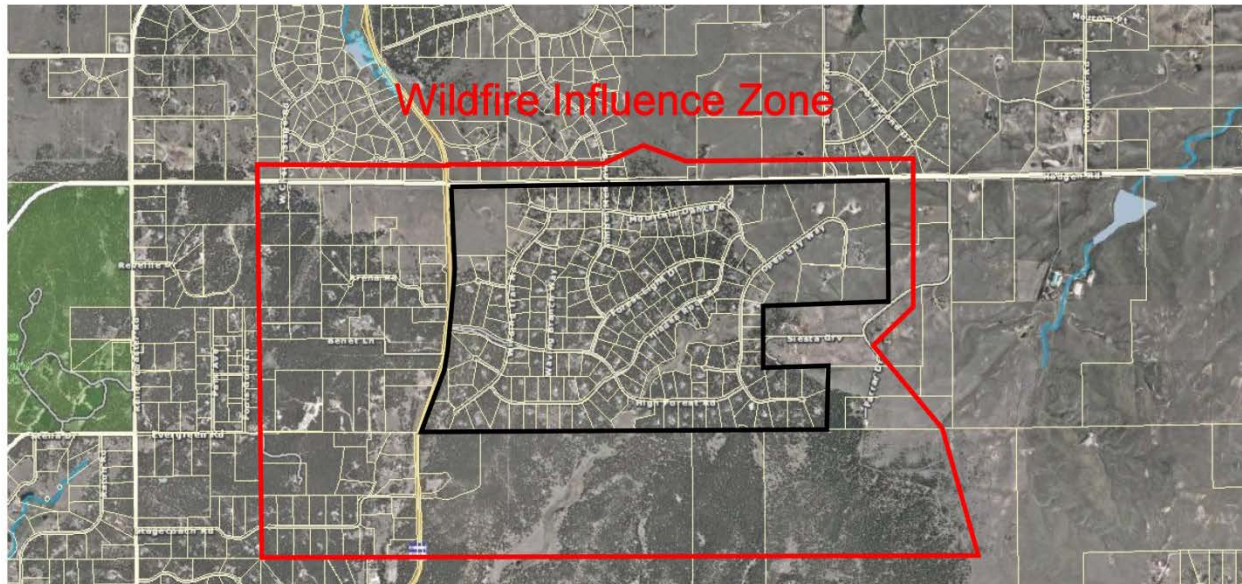
- Large, unthinned, decadent forests will exacerbate fire behavior.
- Limited fuel treatments implemented by homeowners can be easily overwhelmed due to untreated fuels on surrounding properties.
- Unmitigated fuels in El Paso County and Colorado DOT road right-of-ways can threaten civilian evacuation, and firefighter access and safety.
- Aerial resources may be of limited value for reducing rate of fire spread due to extreme fire behavior and high winds.
- Density of the tree canopy provides challenges for the effective placement of retardant by some of the delivery systems in use.

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<sup>3</sup> Framework for Addressing the National Wildland Urban Interface Fire Problem – Determining Fire and Ember Exposure Zones using a WUI Hazard Scale, NIST Technical Note 1748, January 2013, A. Maranghides, W. Mell <http://dx.doi.org/10.6028/NIST.TN.1748>

<sup>4</sup> *Assessing Wildfire Hazards in the Home Ignition Zone*, NFPA, 2010, Publication FWC93710PKD

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**High Forest Ranch WUI Boundary**

## **Wildfire Risk**

Vegetation is dominated by a second-growth ponderosa pine forest with a high percentage of closed crowns, and dense pine understory. Fuel models for the Black Forest Fire are:

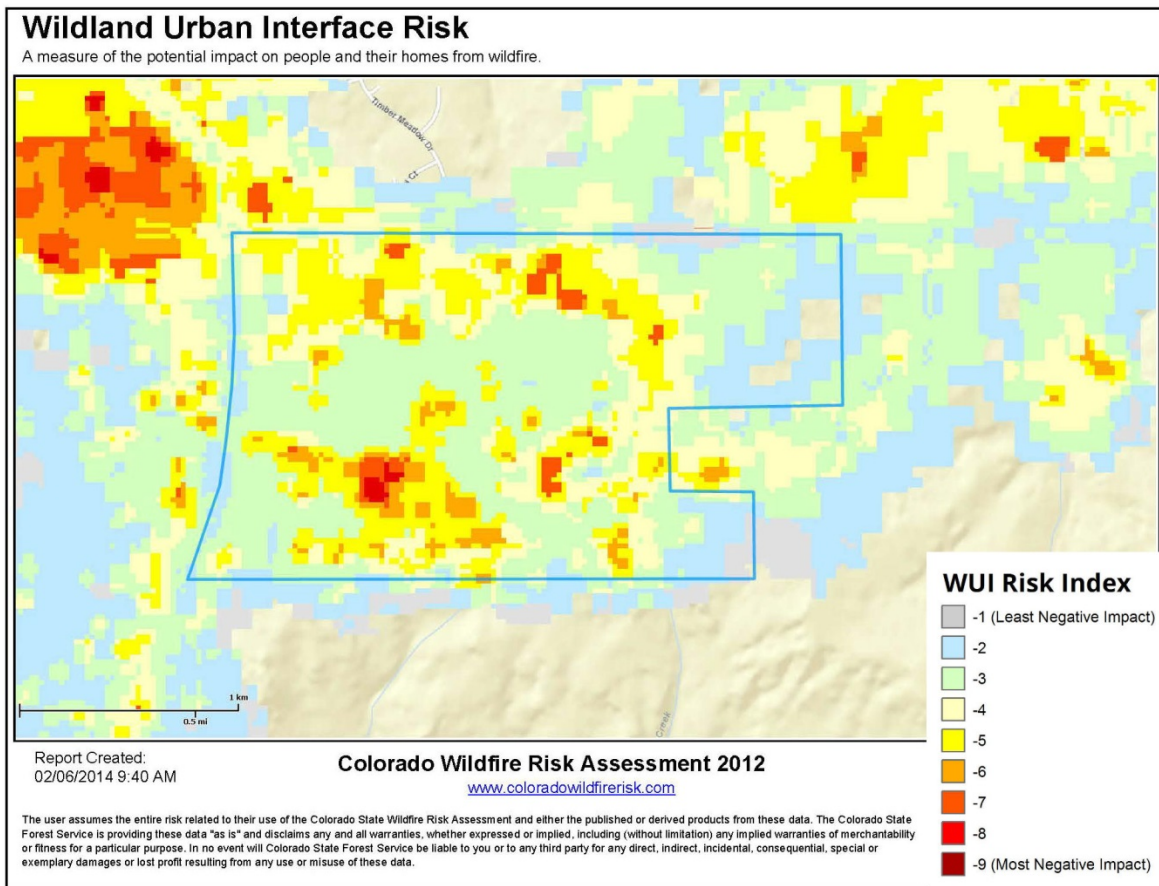
- “Anderson” Fuel Models **1** and **9**<sup>5</sup>
- NFDRS Models **U** and **L**<sup>6</sup>

The wildfire intensity map represents the Colorado Wildfire Risk Assessment Portal (CO-WRAP) analysis of the potential wildfire intensity in and around HFR. Wildfire risk is the chance that a fire might start or spread into the area. Most of the community is at a “Moderate” to “High” risk for wildfire occurrence and intensity.

<sup>5</sup> *Aids to Determining Fuel Models For Estimating Fire Behavior*, Hal E. Anderson, USDA Forest Service General Technical Report INT-122, April 1982.

<sup>6</sup> *Gaining an Understanding of the National Fire Danger Rating System (NFDRS)*, PMS 932/NFES 2665, National Wildfire Coordinating Group (NWCG), 2002.

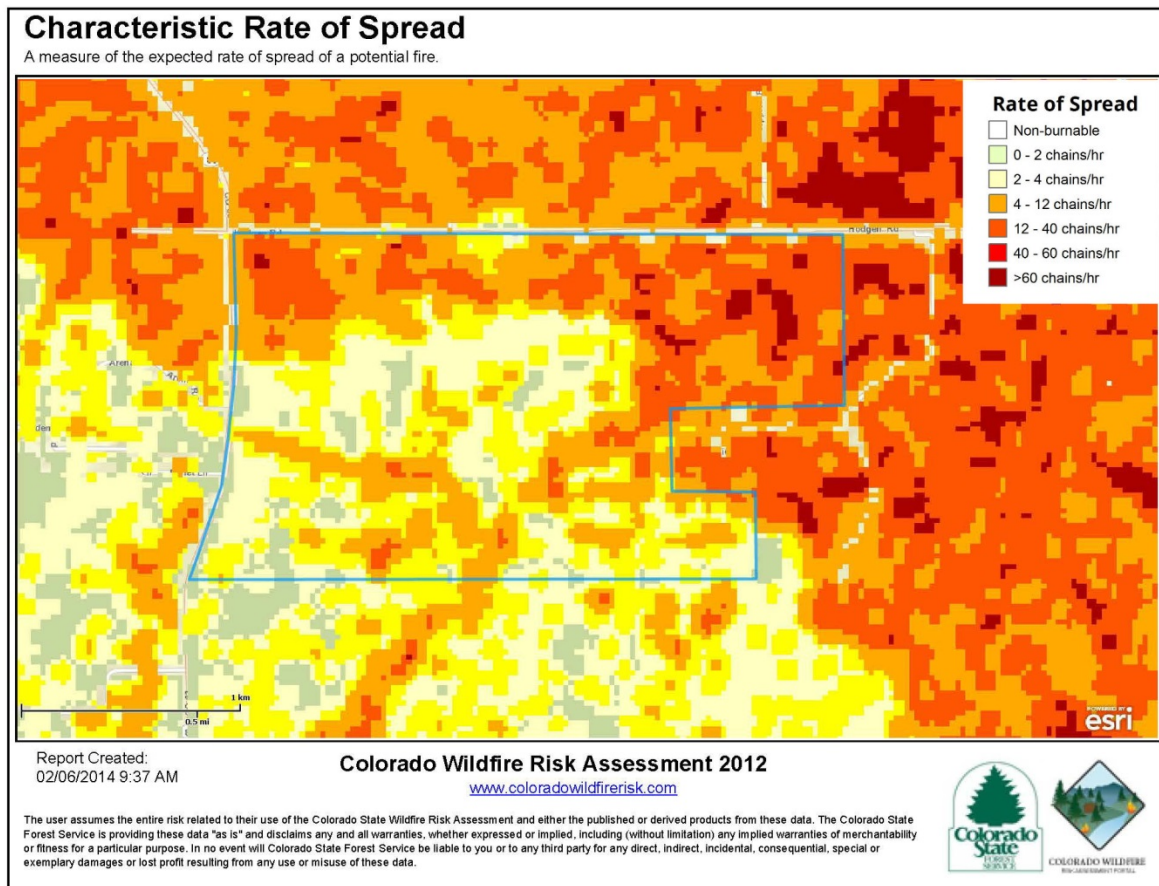




### Wildland Urban Interface Risk for High Forest Ranch and Surrounding Area (CO-WRAP)

When interpreting CO-WRAP data it should be noted that CO-WRAP predictions are based on the average of historical weather over time. Thus, CO-WRAP does not predict fire behavior on any given day, and weather conditions at the time of a fire greatly influence actual fire behavior and spread. For example both the Waldo Canyon and Black Forest fires burned during the most severe fire weather and not on average days. The effect of weather conditions on fire behavior is further explained in the section on fire behavior.

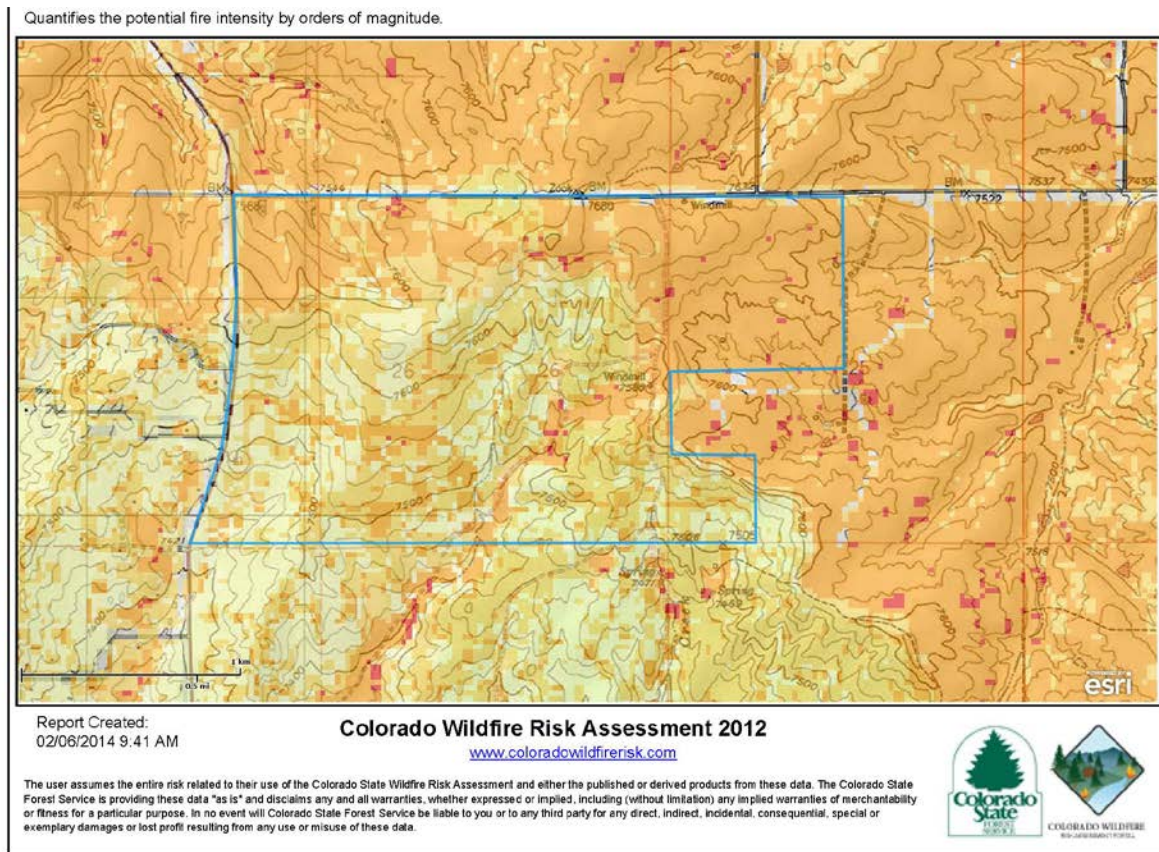
These fuels have high rates of spread under relatively mild weather conditions.



### Characteristic Rate of Wildfire Spread (1 Chain = 66 feet)

Local topography further aggravates fire behavior and control. Prevailing west winds are funneled through the communities involved. Slopes range from ten to over forty percent with most hillsides ranging from twenty to thirty percent.

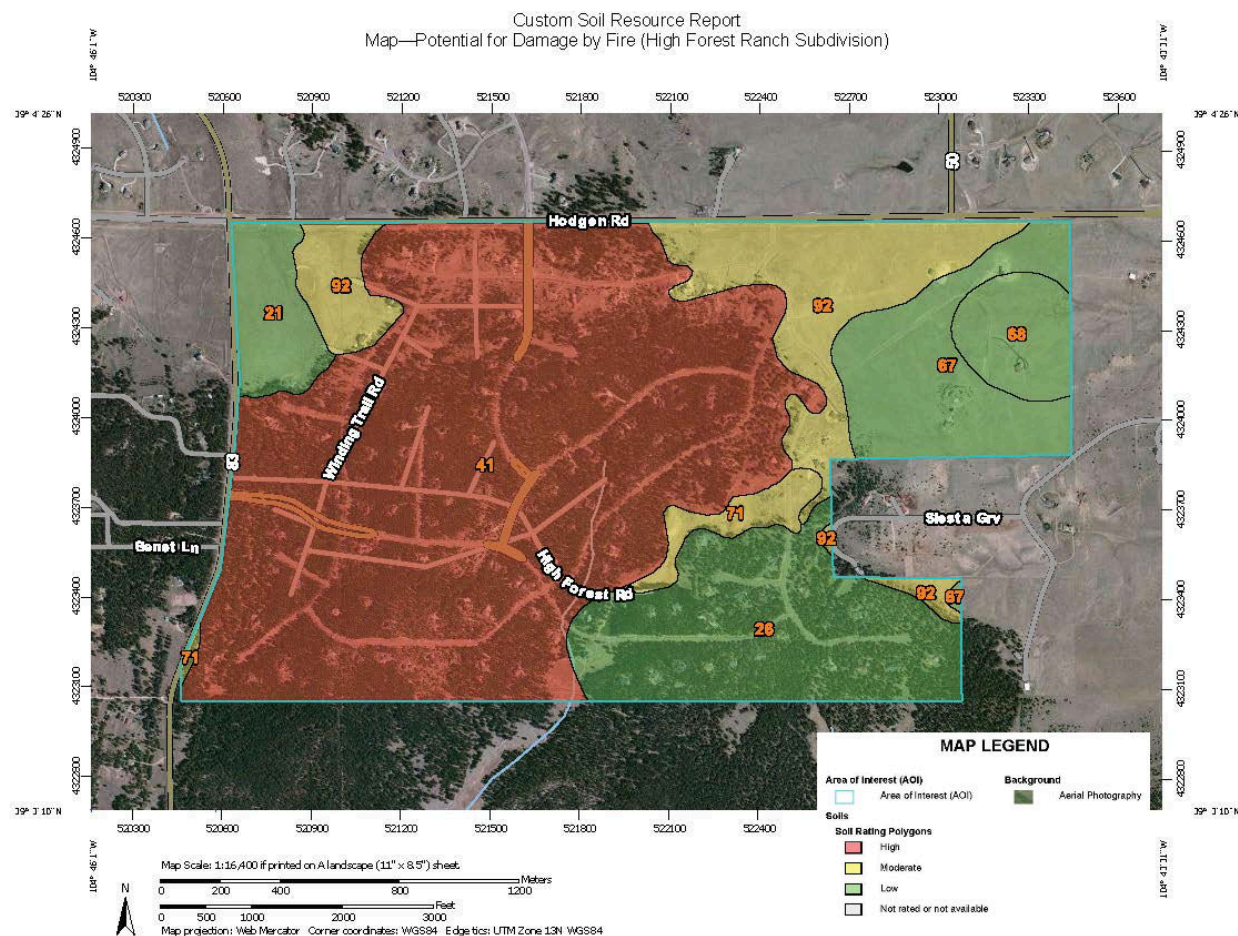
**Note:** Rate of spread shown on these maps is under normal burning conditions. During the Black Forest Fire, burning conditions were considered extreme, with spread rates over 100 chains per hour.



### Topographic Map of High Forest Ranch and Surrounding Area

The area is dominated by *Kettle gravelly loamy sand*, and *Elbeth sandy loam* soils. A severe wildfire within the WUI boundary would threaten the community for many years with the threat of flash flooding and erosion. Natural Resources Conservation Service Soil data show that 70.5% of the soil in the community has **moderate to high susceptibility to damage by wildfire**.





## NRCS Soil Damage by Wildfire Map

The red areas indicate high potential for soil damage and erosion, with yellow showing moderate damage, and green showing low impacts.

## Preparedness to Respond

High Forest Ranch is in the Black Forest Fire Recue Protection District (BFFRPD) and Donald Wescott Fire Protection Districts (DWFPD). The closest station is Wescott Fire's Station 2, located at 15505 Highway 83, with a potential response time to the area of 5-8 minutes.

Emergency response and capabilities are covered in the CWPP's for DWFPD and BFFRPD. High Forest Ranch is also identified in the El Paso County CWPP. All are available at [www.csfs.colostate.edu](http://www.csfs.colostate.edu).

## **El Paso County**

El Paso County has detailed plans and agreements in place to respond to a wildfire anywhere within the County. The quoted passages below are taken directly from the *El Paso County Wildfire Protection Plan*.<sup>7</sup>

### *Inter-jurisdictional Cooperation*

“First responders and community leaders recognize that wildland fire does not respect jurisdictional boundaries, and that large fires can only be managed by pooling resources. As a result, El Paso County enjoys general good cooperation among its many firefighting entities.

### *Standardized Command and Control*

“All County fire departments use the Incident Command System (ICS) and National Incident Management System (NIMS) as a tool to manage interagency response operations. ICS/NIMS clarify roles and responsibilities in many common situations, such as when one area belongs to two overlapping jurisdictions, or when an area is not part of a fire protection jurisdiction.

### *Mutual and Automatic Aid*

“County fire departments have executed several agreements to provide mutual and automatic aid to each other upon request. Groups of neighboring departments have also set up local automatic aid agreements, so that all departments in that group are dispatched to any fire in any of their jurisdictions.

“The El Paso County Sheriff’s Office participates in the 2013 Annual Wildfire Operating Plan for El Paso County Colorado. The Plan, updated annually, describes how County agencies coordinate wildfire suppression activities with those of the [Department of Public Safety (DPS)], the Forest Service, and the Bureau of Land Management. It outlines rules and procedures for requesting mutual aid, ordering out-of-county resources, radio communications, and air operations. The 2013 AOP is scheduled for update after June 1, 2014.

### *An Expanding Hierarchy of Resources*

“The responsibility for wildfire suppression initially rests with the jurisdiction where the wildfire starts. The El Paso County Sheriff is responsible for suppression of wildfires that occur on unincorporated, non-federal land that is outside a fire protection district.

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<sup>7</sup> Russell, Kathy (2011). *Community Wildfire Protection Plan for Unincorporated El Paso County*. El Paso County Sheriff’s Office, Emergency Services Division. pp. 46, 47.

“If a wildland fire grows beyond a local fire protection district’s ability to control, the Sheriff may appoint an incident management team to provide command and control over the fire response. At that point, the Sheriff also may assume financial responsibility for firefighting expenses, on behalf of El Paso County.

“If the fire exceeds the County’s capability to control, the Sheriff can request assistance from the Colorado Department of Public Safety, under terms of the Emergency Fire Fund (EFF) Agreement. When EFF is implemented, DPS assumes responsibility and authority for all suppression activity until the fire has been controlled and management of the fire has been returned to the county.

### County Support to Wildfire Responses

“El Paso County has a mature system for mobilizing County and community resources to support a wildfire response.

### Public Notification and Warning

“The Sheriff’s Office has several methods to notify and warn people who are threatened by an approaching wildfire:

- Automated telephone notification
- Local news media announcements
- When possible door-to-door warnings

### Evacuation and Sheltering

“An Incident Commander may request evacuation of specified neighborhoods, or closure of certain roads; the actual evacuation is the responsibility of the Sheriff.

“The El Paso County Emergency Operations Center coordinates evacuation and sheltering for displaced persons, as well as their service animals, pets, and livestock.”

## **Emergency Evacuation**

**NOTICE TO EVACUATE.** In case of a fire or other emergency, the primary notification to evacuate will be issued by the El Paso County Sheriff by means of a reverse emergency notification system. Members should follow directions provided in the recorded message. Other notifications may come from local TV and Radio stations.

**EVACUATION ROUTE.** The primary evacuation routes will be to Hodgen Road and State Hwy 83.

It is important to note that the fatalities in both the Waldo Canyon and Black Forest Fires were of residents who did not evacuate in time. In the event of a fire, the El Paso County Sheriff will determine the best evacuation routes and procedures based on expected fire behavior. Residents should heed the evacuations instructions given by the Sheriff without delay! If a fire is threatening the area, it is not necessary to wait for an evacuation order to leave.

It is vitally important that residents are prepared to evacuate long before a fire or other disaster. Just as fire mitigation should be complete long before a fire threatens, a personal plan for evacuation should be prepared before it is needed. A personal evacuation plan should consist of:

- Papers, photos computer drives, prescriptions and other important items should be stored and ready to take a moment's notice.
- Be sure to have a bag packed with a change of clothes and personal items packed and ready.
- Keep a complete inventory, including photos of your home contents, of items in the home stored in a safe location if need to document insurance claims. Be sure you insurance coverage is adequate.
- Have a plan to shelter pets and livestock.
- Have a communication plan for all members of your family to stay in contact. Have an agreed upon meeting place, such as a friend's home, for family members in case you are separated.

Emergency notification calls are not automatically routed to cellular phones. Residents who rely only on cellular phones should register their cell phones at: <http://www.elpasoteller911.org/> to be certain of notifications.

## **Risk of Ignition and Wildfire Occurrence**

### **Causes of Wildfire Ignitions**

Reconstruction of fire history and forest dynamics in the Black Forest area along the Palmer Divide, reveals (i) an average fire interval of about fifty years during the period 1300-1880, but no major fires between 1880 and 2002; (ii) a mix of non-lethal surface fire and lethal, stand replacing fire in the historic burns (mixed severity fire regime); and (iii) a striking increase in forest density from 1900-2002.

The extent of the high-severity Hayman burn in 2002 was unprecedented in the last 700 years, in part because of the dense forest conditions that had developed during the

twentieth century, and in part because of the extreme drought and fire weather conditions that existed in 2002. Similar drought conditions contributed to the Waldo Canyon fire a decade later.

Low fuel moistures and relative humidity are common in the area, as are periods of high winds. When dry and windy conditions coincide the stage is set for large wildfires. Human population is increasing in the area. All recent large fires were caused by humans. Numerous fires are ignited each year by lightning. Except for portions of Florida, this area has some of the highest occurrence of lightning in the continental US.

Fires originating in or near communities are the most immediate concern, but fires starting well beyond the boundaries of the planning area can have profound effects upon the communities. Rapid rates of spread and long distance spotting are the norms for fires in the vicinity. Areas classified as high to moderate fuel loading are the most worrisome.

Natural fires were typically caused by lightning. Aboriginal use of fire in the area is unknown. Human activities, both accidental and intentional, remain as the highest risk for fire starts. Highway 83 abuts the HFR west boundary. Hodgen Road abuts the north boundary. These roadways create exposures from auto accidents, disabled vehicles, cigarettes, and right-of-way maintenance activities. Internal HFR exposures to fire can be from maintenance equipment, barbeque grills, unsupervised youth, and burning structures. A more detailed fire history for the area can be found in Appendix E.

## **Fuel Hazards**

### **Factors Affecting Homes in the Wildland/Urban Interface**

The overall risk to the community from wildland fire is moderate to high. This section will discuss the factors considered that led to the overall rating. There are currently 165 structures in the Wildland/Urban Interface (WUI). The homes in HFR have various risks of being destroyed by a wildfire. The amount of risk depends on the vegetative fuels, topography, weather events, and the construction of the home itself. It is important to understand these conditions and factors in order to make appropriate decisions about vegetative fuels reductions.

Fire Behavior at any time is dependent on three factors: weather, topography and fuels.

**Weather:** Weather influences fire behavior as both a long term and transient phenomenon. Long term weather trends such as extended drought increase the possibility of ignition and increase the rate of fire spread.

**Topography:** Topography includes the degree of slope and the shape of the terrain. Hot gases rise in front of the fire along the slope face, pre-heating the vegetation above a fire. As slope increases the effect of the preheating and increased spread increases,

and fires may move up to four times faster with flames twice as long than a fire on level ground.

**Fuels:** The two fuel types in a WUI are vegetative and structural. Vegetative fuels consist of living and dead trees, bushes, and grasses. Typically, grasses ignite more easily and burn more quickly but with less intensity than trees. Fires can move quickly through grass and herbaceous vegetation, and these smaller fuels are often the kindling that moves fires to larger size fuels.

Fire intensity and spread rate depend on the fuel type and condition (live/dead), the weather conditions prior and during ignition, and the topography. Generally the following relationships hold between the fire behavior and the fuel, weather and topography.

- Fine fuels ignite more easily and spread faster with higher intensities than coarser fuels. For a given fuel, the more there is and the more continuous it is, the faster the fire spreads and the higher the intensities. Fine fuels take a shorter time to burn out than coarser fuels.
- The weather conditions affect the moisture content of the dead and live vegetative fuels. Dead fine fuel moisture content is highly dependent on the relative humidity and the degree of sun exposure. The lower the relative humidity and the greater the sun exposure, the lower will be the fuel moisture content. Lower fuel moistures produce higher spread rates and fire intensities.
- Wind speed significantly influences the rate of fire spread and fire intensity. The higher the wind speed, the greater the spread rate and intensity.
- Topography influences fire behavior principally by the steepness of the slope. However, the configuration of the terrain such as narrow draws, saddles and so forth can influence fire spread and intensity. In general, the steeper the slope, the higher the uphill fire spread and intensity.

### **How Structures Catch Fire**

There are three ways that a wildfire can transfer itself from natural vegetation, or burning homes, to other homes. They are through radiation, convection, and firebrands.

**Radiation:** Wildfires can spread to a home by radiating heat in the same way a radiator heats rooms in the wintertime. Radiated heat is capable of igniting combustible materials from a distance of 100 feet.

**Convection:** Direct contact with flames, or the wildfire's convective heat column—the hot air and gasses rising from the flames—may also ignite a home. This will most likely occur when trees or brush near a structure ignite and the flames touch a flammable part of the structure.

**Firebrands:** Firebrands are burning materials that detach from a fire during strong convection drafts in the burning zone. In most cases, the flame front passes quickly, but a shower of burning embers, or firebrands, impinges on the structure for some time

before and after the flame front passes. Firebrands are most often the cause of home loss. Firebrands can be carried long distances – more than a mile – by the winds associated with a wildfire. Many homes in community are particularly vulnerable to firebrands.

### **Home construction and Vulnerability to Wildfire:**

High Forest Ranch is located in a wildfire environment. Wildfires will happen--exclusion is not a choice. The variables in a fire scenario are when the fire will occur, and where. This assessment addresses the wildfire-related characteristics of HFR. It examines the area's exposure to wildfire as it relates to ignition potential. The assessment does not focus on specific homes, but examines the community as a whole.

A house burns because of its interrelationship with everything in its surrounding home ignition zone---the house and its immediate surroundings. To avoid a home ignition, a homeowner must eliminate the wildfire's potential relationship with his/her house. This can be accomplished by interrupting the natural path a fire takes. Changing a fire's path by clearing a home ignition zone is an easy-to-accomplish task that can result in avoiding home loss. To accomplish this, flammable items such as dead vegetation must be removed from the area immediately around the structure to prevent flames from contacting it. Also, reducing the volume of live vegetation will affect the intensity of the wildfire as it enters the home ignition zone.

Included in this assessment are observations made while visiting HFR. The assessment addresses the ease with which home ignitions can occur under severe wildfire conditions and how these ignitions might be avoided within the home ignition zones of affected residents. High Forest Ranch residents can reduce their risk of destruction during a wildfire by taking actions within their home ignition zones. This zone principally determines the potential for home ignitions during a wildland fire; it includes a house and its immediate surroundings within 100 to 200 feet.

The result of the assessment is that wildfire behavior will be dominated by the residential characteristics of this area. The good news is that by addressing community vulnerabilities, residents will be able to substantially reduce their exposure to loss. Relatively small investments of time and effort will reap great rewards in wildfire safety.

The construction materials, location and even the shape of a structure influence its vulnerability to wildfire.<sup>8</sup> It is not the intent of this CWPP to suggest extensive alterations to homes that already exist in the community. Understanding how home construction affects the vulnerability of the structure to a wildfire helps residents plan defensible space projects to compensate for construction differences. When remodeling or home improvement projects are done plans can be made to reduce the ignitability of the buildings.

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<sup>8</sup> Slack, Peter, (2000): *Firewise Construction: Design and Materials*. Colorado State Forest Service.



## PRESCRIPTIONS FOR WILDFIRE HAZARD REDUCTION

### Home Ignition Zone, Defensible Space and Fuel Breaks:



Diagram of Home Ignition Zone

In a broad sense there are two generalized categories of mitigation. First is defensible space thinning in the Home Ignition Zone around structures to increase the chance that the structure will survive a wildfire. Second, is fuel break thinning away from structures to reduce severe fire behavior and give firefighters a safer place to work and possibly halt an approaching wildfire. Both approaches require thinning of the canopy and removal of ladder fuels. The approach will vary depending of the forest conditions existing on the area in question.

### **THE HOME IGNITION ZONE:**

Modification of vegetation around a structure to reduce fire intensity is called defensible space. The term “home ignition zone” (HIZ) is defined as a structure and the surrounding vegetation. A structure’s vulnerability to wildfire depends on the surrounding vegetation, including landscaping, and the structure itself.

**Protecting Homes in the HIZ:** Thinning around homes is different than thinning for fuel breaks. Thinning in the HIZ is designed to protect structures from the heat of wildfires. Defensible space includes both thinning around structures to reduce the heat from burning vegetation and reducing flammability of the structures to protect them from wind born embers, radiation and convective heat. Further information about increasing the survivability of structures is found on the CSFS web site at:

<http://csfs.colostate.edu/pages/pub-csfs2.html#wildfire>.



Defensible space is defined as an area around a structure where existing vegetation is modified to slow the rate and intensity of an advancing wildfire. This includes selective removal of trees around structures in two or three concentric management zones. On slopes, increase the width of each zone on the downhill side. Fuels are reduced according to prescriptions for each zone.

Zone One: This is the closest zone to a structure, and extends 30 feet from the outermost edge of a structure including any decks. The management goal is to reduce or eliminate most large trees or shrubs within this zone so that the convective heat will not ignite the structure. A few tall trees may be left in zone one if the lowest branches are pruned so that they are well above a fire resistant roof. It is best to limit this to one or two trees near a structure. Treat such trees as part of the structure and create 30 feet of space outside the tree.

While it is necessary to remove combustible material in zone one within five feet of foundations and under decks, it is not necessary to do so elsewhere. Needles on the forest floor act as mulch retaining moisture in the soil, reduce erosion, and add organic matter to the soil as they decay. If regeneration of new trees is an objective, however, it is desirable to expose some bare soil since this will promote seed germination and establishment. *Raking up pine needles is not a substitute for thinning and ladder fuel removal.*

Zone two: The width of zone two depends on the slope around the house. If the average slope angle is less than 5%, zone two extends out 70 feet from zone one (100 feet total distance around the house). As slopes increase, increase the width of zone two on the downhill side of the house, and increase the spacing between tree crowns.

The main fuels reduction guideline for zone two is to thin the trees to an average spacing of 10-foot crown separation. Clumps of two or three trees may be retained in this zone if the space between the clump and the adjoining trees is at least 20 feet. All ladder fuels under trees should be removed. The branches of large trees should be pruned to a height of 10 feet above ground, but small trees should have at least two-thirds of the green needles remaining.

Firefighters must be able to escape quickly if conditions suddenly deteriorate. Zone two should extend along both sides of driveways for a width of 30 feet from each edge of the drive. This is important to allow safe access and egress for emergency vehicles. Adequate clearance should be maintained to allow access for large structural fire trucks. Twelve feet of horizontal clearance and 13 feet of vertical clearance should be maintained. At the end of driveways, adequate room for a large fire engine to turn around should be maintained.

Zone three: The guideline for zone three is to thin the forest primarily to improve forest health. Spacing is less critical in this area but spaces should be made in the canopy. A useful rule of thumb is that a tree should receive sunlight from all four sides.

**Note:** See *High Forest Ranch Firewise Guidelines* (Appendix D) for current guidance. These will be updated periodically to reflect new science, technology, fire department, and insurance company guidance.

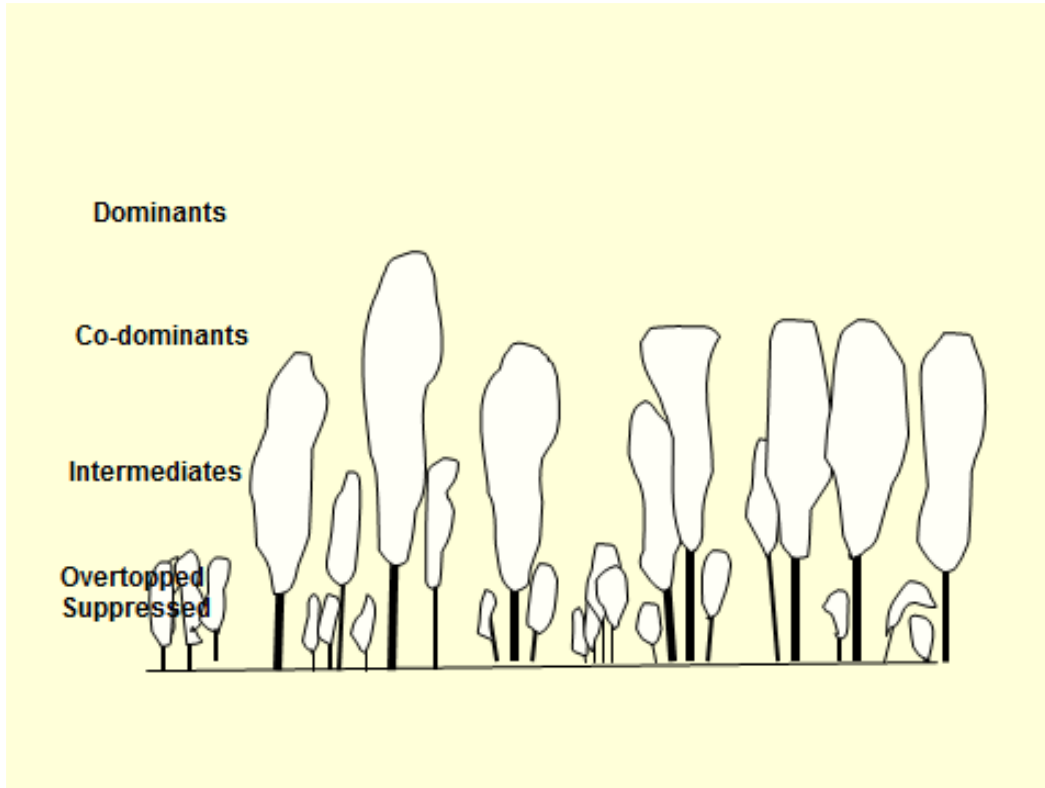
### **Thinning and Fuel Reduction**

Foresters use many methods of thinning depending on the specific objectives of the landowner. Fuel break thinning is most often accomplished by a process called thinning from below. Trees are usually removed or remain based on their height in the canopy.

For simplicity, trees can be divided in four levels in the forest canopy. The largest trees at the highest level of the canopy are called dominants. These are usually the most vigorous since they have the largest root systems, most leaf area and receive the most sunlight. Next are the co-dominant trees generally the same height and diameter, but not overtopped by other trees, including dominants. Intermediate trees occupy the middle level of the canopy, but tend to be crowded and of smaller diameter. They are less vigorous with smaller root systems and fewer leaves as the result of crowding by the dominant and co-dominant trees. At the lowest level of the forest canopy are the overtopped trees. These are completely shaded by the dominant and co-dominant trees.

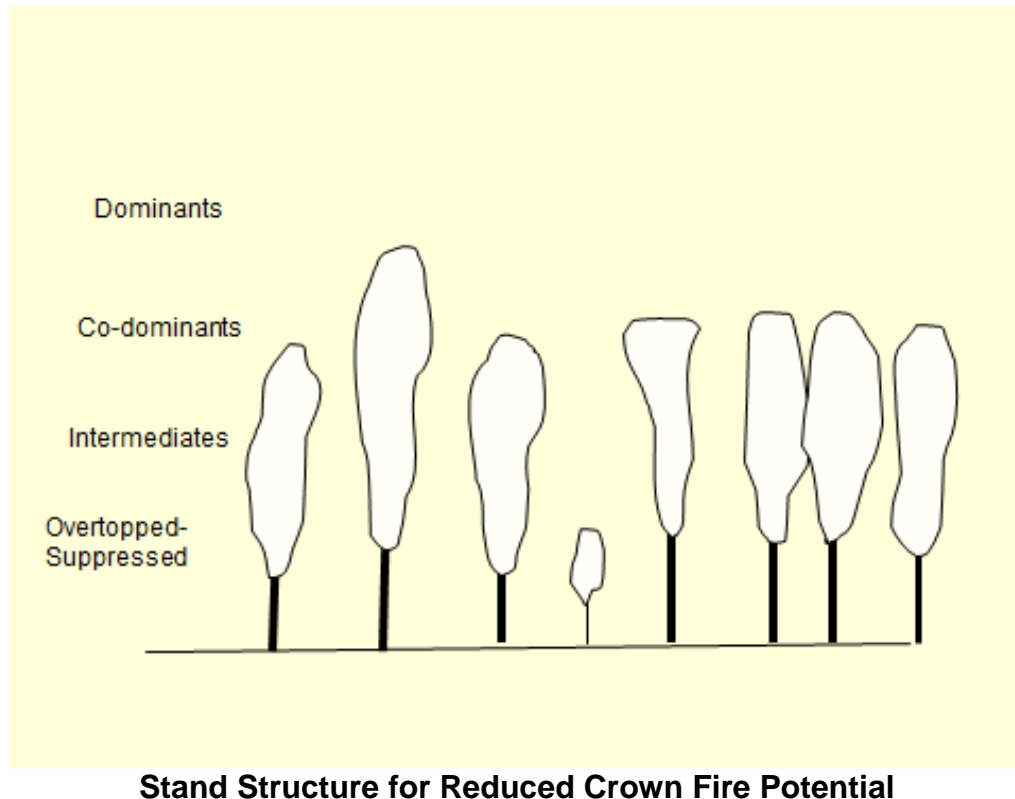


Thinning from below on the Black Forest School Section. These trees were first thinned in about 1980, and dense regeneration was thinned again in 2008.



### **Crown Fire Prone Stand Structure**

Thinning from below removes all of the overtopped and most of the intermediate trees. It is essential when thinning for fuel breaks to remove ladder fuels and create enough openings in the forest canopy to reduce the crown fire risk. Thinning from below is desirable in fuel reduction projects because it: 1) leaves the most vigorous trees on the site; 2) creates openings in the forest canopy by removing the less vigorous co-dominants and intermediate trees; and 3) eliminates ladder fuels by removing the overtopped trees, shrubs, and pruning lower limbs of remaining trees.



### **Maintenance**

Survivable space, fuel break thinning, or any type of forest management, does not end when the initial project is finished. Continual maintenance is an essential part of any forest management program. Even in well managed forests trees will die, storms and wind will damage trees, and new trees will germinate.

Trees should be inspected every spring for any sign of damage from winter or spring snows or wind. Prune any broken branches if they are not too high in the tree, and trees bent by heavy winter snows should be removed. Check for any signs of insect activity or disease.

Late October is the best time to inspect trees for attack by mountain pine beetles. Beetles have finished attacking trees at this time, and there is adequate time to cut and treat the tree before the adult beetles fly the next July.

At five years check the canopy closure, especially in zones one and two. Remove any trees necessary to maintain openings in the canopy. Do any additional pruning or removal of trees and shrubs to eliminate ladder fuels.

After ten years, dense thickets of young trees (regeneration) may have become established, and these will need to be thinned. Not all regeneration should be cut since trees of various ages are important for forest diversity. Young trees in openings with adequate room to grow should remain. Regeneration that is likely to become ladder

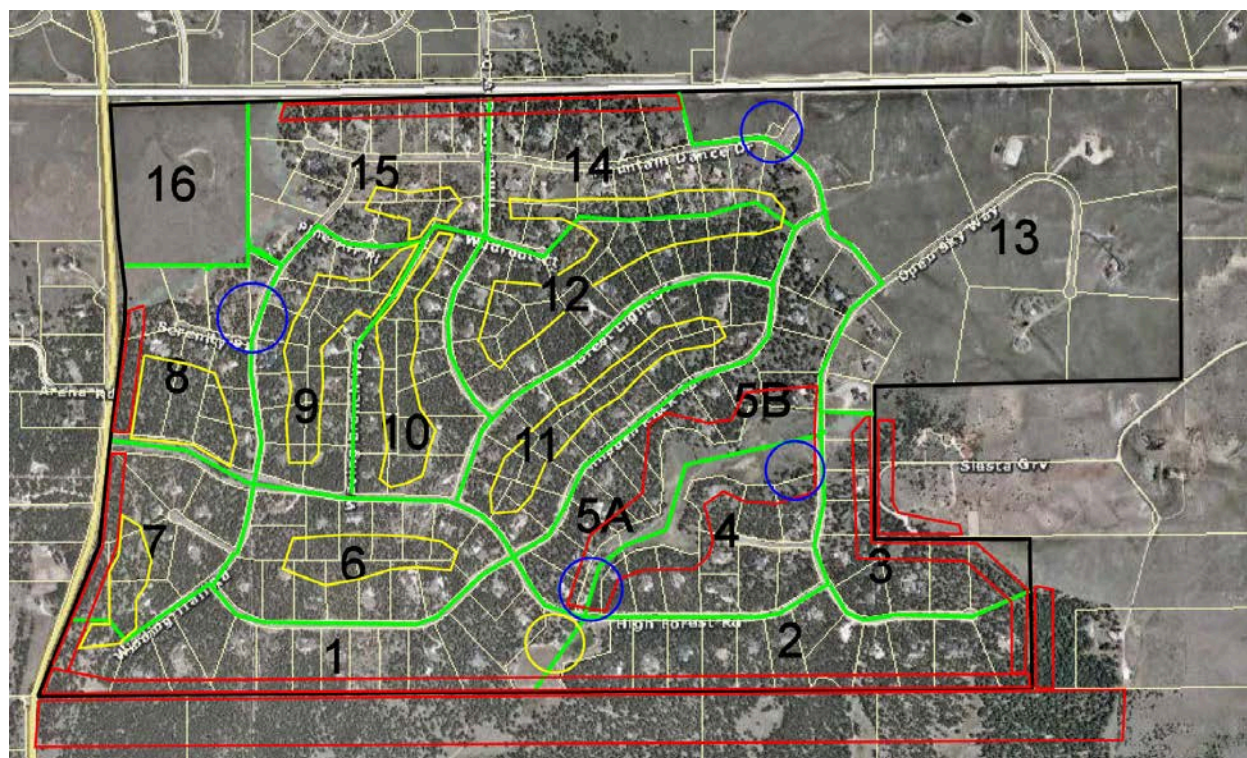


fuel or crowded by other trees should be cut. Depending on their objectives, landowners may want to consider removing some of the larger trees to make room for the younger ones.

## IMPLEMENTATION AND MONITORING

### Implementation

A table in Appendix A lists all of the HFR mitigation projects identified, their priority rankings and the lead agency for the projects. In addition to the projects in Appendix A, approximately 80% of home sites are rated as high or extreme wildfire hazard and are in critical need of defensible space improvement. In total, about 20 small and large projects have been identified. These are shown in the figure below:



**Proposed Fuel Treatment Areas**

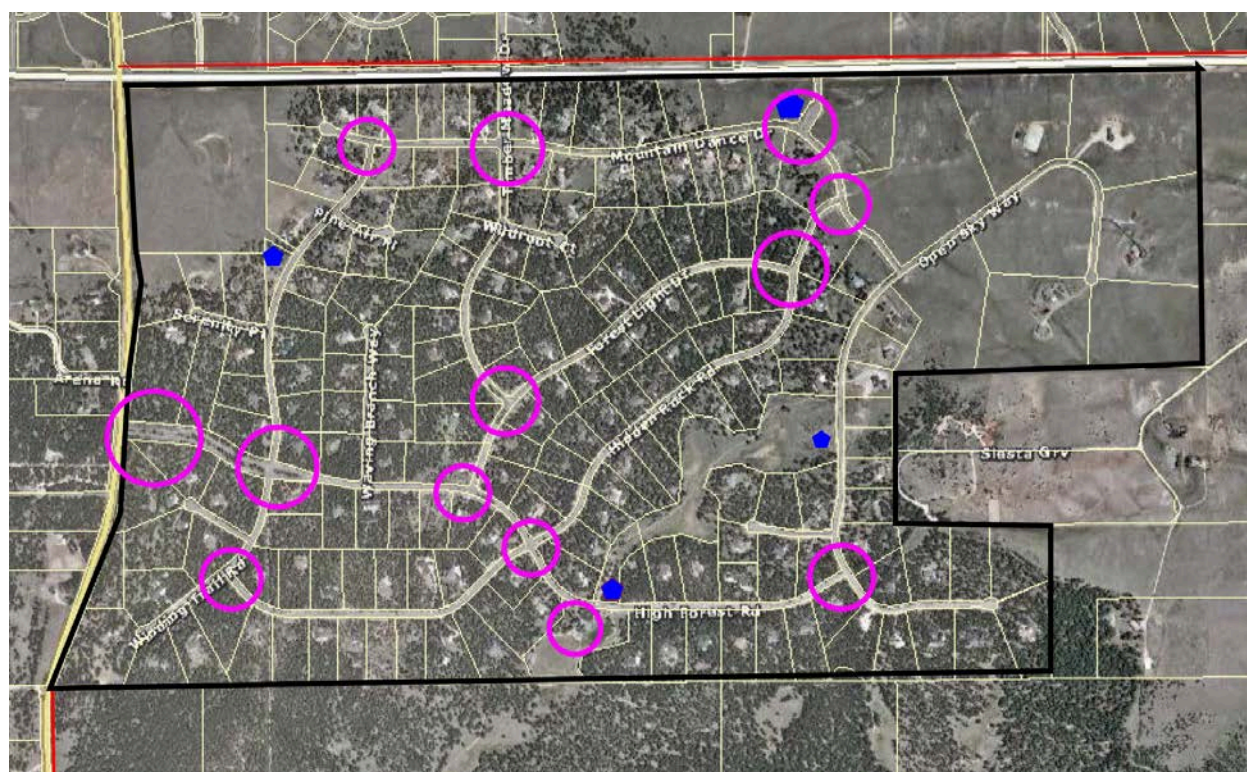
The following are suggested fuel treatments:

- ❖ Shaded Fuel Breaks (SFB, red zones)- These should follow CSFS guidelines where possible.<sup>9</sup> Connection of homeowner HIZ's to SFB areas is recommended.

<sup>9</sup> Fuel Break Guidelines for Forested Subdivisions and Communities. Frank C. Dennis, Colorado State Forest Service.

- ❖ Firefighter Safety Zones (blue circles)- These should follow NWCG guidelines for firefighter safety zones (see **Appendix C**), and based on all personnel in full Personal Protective Equipment (PPE).<sup>10</sup> Diameters to be adjusted based on surrounding fuel loading.
- ❖ Forest Management and HIZ overlap zones (yellow zones)- These are on private property, typically in Defensible-space Zones 2 and 3. Ladder fuels should be reduced or removed, and forests thinned to promote forest health. Where possible, the long range goal should be establishment of an uneven aged forest.

The figure below shows key intersections and areas that should be monitored regularly for fuel buildup.



### Key Intersections

These intersections will be critical during a wildfire for:

- ❖ Safe egress of residents during evacuation.
- ❖ Residents may be required to wait at intersections temporarily while evacuation is staged from areas of greatest wildfire threat.
- ❖ Safe ingress of emergency services.
- ❖ Safe staffing by law enforcement personnel who may be directing traffic.

<sup>10</sup> Fireline Handbook, National Wildfire Coordinating Group.



## **Monitoring**

Monitoring is an important part of follow-up to the implementation of projects. HFRA instructs participants to establish, where interest is expressed by the communities, a collaborative multiparty monitoring process. This process should address reporting of accomplishments, need for maintenance of treated areas, tracking of burned areas and the positive and negative ecological and social effects of the projects. This can be incorporated into the HFR Firewise Community annual reporting, and/or become a budget line item as an annual reminder to the entire community. In-kind tracking will be one way to gauge levels of participation.

Monitoring in the High Forest Ranch Community Wildfire Protection Plan calls for an annual field review by the partners (participants) of accomplishments and need for maintenance. Based on this review, it calls for needed adjustments in the next year's plan, as appropriate. Thirdly, it calls for a determination of interest and meeting by the partners for monitoring the ecological and social effects of projects. Finally, once 80% of the identified project areas have been completed, HFR may want to consider updating the CWPP. At this point, the community will be substantially fire adapted, and may call for completely different fire suppression strategies. These tasks are identified in the table found in **Appendix B**.

## **High Forest Ranch Community Action Plan**

During the CWPP process, the following actions were suggested:

- ❖ Provide operational authority to DWFPD and BFFRPD for use of the HFR emergency water supplies. This can be in the form of an agreement authorized by the HFR board of directors.
- ❖ Develop a community evacuation map for distribution to all residents.
- ❖ Install evacuation route signs at the three exits from HFR.
- ❖ Develop a template for installation and maintenance of community street signs, light poles, and mail kiosks to prevent damage by wildfire.
- ❖ Coordinate with Shamrock Ranch on joint fuel treatment projects along the southern boundary of HFR, including participation in possible grant funding.
- ❖ Coordinate with owners in the Farrar Road/Siesta Grove area for possible joint fuel treatment projects.
- ❖ Coordinate thinning and/or tree removal with CDOT in the State HWY 83 right-of-way to reduce crown fire potential and remove ladder fuels for fire starts in the roadway.
- ❖ Implement at least two demonstration fuel treatments or forestry projects on private lots.

- ❖ Develop an overall drainage map showing locations of culverts and major drainage swales that might be impacted by post-fire sediment runoff. Erosion control contractors should be contacted to obtain pricing.
- ❖ Implement a “Don’t Fence Me In” program, in cooperation with Mountain View Electric Association for all above ground electrical facilities in HFR.
- ❖ Establish community guidelines for Firewise construction, landscaping, and forestry practices in coordination with all HFR committees. These should be updated as needed.

The following are actions the community can incorporate into its routine budget categories to manage wildfire risks. These are broken down into categories that allow for annual planning and budgeting (See Appendix B).

### **Seasonal**

- ❖ Mowing:
  - Road sides and roadside ditches- Monthly or as warranted by fire danger.
  - Re-inspect all intersection sight distances for cleared sight triangles.
  - Clear all grasses and fine fuels 3-5 feet from around street signs, light poles and mail box kiosks using weed eaters or non-selective herbicides.
  - Open Spaces- Twice per year
    - First mowing mid-summer after wildflower bloom and before grass curing (browning).
    - Second mowing in the fall after grass curing (to reduce wildfire rate of spread during fall/winter fire season, and allow new, green re-growth in the spring).
- ❖ Common Area and Entry Landscaping:
  - Spring cleanup to remove all dead materials (twigs, leaves, needles, etc.).
  - Remove storm damaged trees and branches.
  - Mid-summer re-inspection to again remove fine fuels within 5-10 feet of all combustible materials.
- ❖ Education/Awareness:
  - Spring alerts/mailings for:
    - Emergency notification system signups and updates.
    - Family evacuation plans.
    - Home inventories.
    - Home assessments by local fire agencies.
  - Early to mid-Summer:
    - Firewise classes with emphasis on structural ignitability and forest health.
- ❖ Implementation
  - Annual slash disposal program.



- Consider developing a second seasonal slash disposal effort.
- Coordinate/facilitate property to property (neighborhood) fuel treatment projects.

## **Annual**

- ❖ Renew Firewise Community status
  - Firewise Day, meeting or special event.
- ❖ Coordinate cross-training between all committees (Forestry, Architectural Control, and Fire Mitigation)
- ❖ Update annual operating agreements with local fire agencies for emergency use of common areas and water supplies.
- ❖ Continue to encourage neighboring property owners to implement lot-to-lot mitigation projects that enhance all home ignition zones (HIZ).
- ❖ Review CWPP to determine annual project needs:
  - Apply for grant funding as available.
- ❖ Contact all partners to update any wildfire mitigation needs related to critical infrastructure.
  - Mountain View Electric- Power line clearance needs along HWY 83 and Hodgen Road.
  - Utility pedestal clearances inspected to reduce loss or damage by wildfire.
  - Colorado Department of Transportation (CDOT) tree removals and pruning along HWY 83.
  - Right-of-way mowing along public roads.
- ❖ Inspect all fuel treatment areas to identify any maintenance needs, such as dead tree removal, storm damage cleanup, or insect/disease control.
- ❖ Meet with Shamrock Ranch to coordinate fuel treatment projects.
- ❖ Coordinate with Wescott Fire on HWY 83 fuel treatment projects.
- ❖ Continue community wide educational programs through classes, meetings and annual events. Topics may include:
  - Evacuation Planning.
  - El Paso/Teller 911 program signup (target of 100% participation).
  - Forest Health and related topics.
  - Noxious Weed prevention and control.
  - Wildlife habitat restoration.
  - Insurance coverage for “being made whole again” in the event of home loss.
  - Neighborhood Watch, and “phone trees” (cascading phone call plan to ensure all residents are notified).
  - Special Needs Populations.
  - Evacuation Planning for Pets and Livestock.

## **Every Three/Five/Ten Years**

- ❖ Inspect all fuel treatments for:
  - Tree crown closure in all areas
    - Shaded Fuel Breaks and Zone 2: 10 feet between crowns (20 feet between crowns of tree clumps).
    - Forest Health Thinning Zone 3: 3-5 feet between crowns and/or to allow full sun to tree crowns for optimum tree growth/health.
  - Seedling tree invasion/encroachment
    - Mow or cut seedling and sapling size trees when located within the drip line of mature trees, or not in full sun locations.
    - Where trees establish in open areas, thin out trees to promote full crown development, and reduce crowning potential.
    - Prune as necessary to reduce torching potential.

## **Summary**

This plan is intended as a guide to help reduce losses from catastrophic wildfire. The CWPP is a living document that allows for flexibility. Adjustments, based on new science and technologies, can be adopted without need for plan modification, so long as the intent of the CWPP is met.

High Forest Ranch is a special community and provides a unique living environment. Wildfires are inevitable and a part of the Ponderosa Pine ecosystem. It is not a matter of “if”, but “when”. It takes a community that is resolved to work together to manage this risk. Responsibility begins with every property owner, supported by community wide mitigation efforts.

# **Appendix A**

## **High Forest Ranch**

### **Fuels Management Project Areas**

#### Guide Notes:

- 1) Compartments delineated by green lines and numbered 1-15. Boundaries can be modified as needed based on participation of ownerships. Compartment members are encouraged to develop their own sub-compartments as they unify their fuel treatments and forest health restoration efforts. Aerial photos with property lines are available at: [www.elpasoco.com](http://www.elpasoco.com) using the “El Paso County Parcel Viewer”.
- 2) Suggested Shaded Fuel Break areas are delineated with red lines and identified by a pink letter. Project area acreages are estimated based on an average width.
- 3) Suggested Forest Health Restoration areas are delineated by yellow lines and identified by a pink letter. Forestry or fuel treatment levels will vary depending proximity to untreated areas and participation of abutting owners. If unified, most areas will follow forest health prescriptions, unless within an HIZ/D-Space Zone 2, or recommended shaded fuel break area.
- 4) Blue circled areas, identified by pink letters, should follow NWCG Safety Zone Guidelines listed in Appendix C.

# High Forest Ranch

## Project Areas

3/18/2014

Road Right-of-Ways		Filing	Acres				Treatment Type	Priority
High Forest Road, Timber Meadow		F-1, Tract E	94.73				SFB	1
Hidden Rock, Forest Light		F-3, Tract D	12.1				SFB	1
Mountain Dance, Open Sky		F-2, Tract D	28.1				SFB	1
			134.93					
<b>Community Open Spaces</b>								
Meadow 1		F-3, Tract C	21.71					
Meadow 2 (Pond at HF Road)		F-1, Tract C	2.88					
The Lodge		F-1, Tract D	8.48					
Cistern, Winding Trail		F-1, Tract B	1.77					
Cistern, Reflection Place		F-2, Tract F	0.25					
School Site		F-2, Tract E	12.17					
Shamrock Ranch out-parcel		Mts-Bnds	0.6					
Total Acreage (approx.)			984					

Projects	Area (letter)	Acres	# lots	Ave. Width (ft)	Ave. Length (ft)	Ave. Radius (ft)		
Community Slash Treatment Program		984	200					
Shamrock Ranch Shaded Fuel Break (SFB)	A	120		600	8712		SFB	1
HFR/Shamrock SFB	B	38	27	150-200	7600		SFB	1
Highway 83 SFB	C	16	7	200	3485		SFB	1
Hodgen Road SFB	D	14	12	200	3049		SFB	1
Farrar/Siesta Grove (east border) SFB	E	12	8	180	2904		SFB	1
							SFB	1
The Meadow	F	58	18	600	3000		SFB	1
The Lodge Firefighter Safety Zone	G	7.3	2			300	SFB	1
Open Sky Dry Hydrant/Pond	H	3.5	3			300	SFB	1
Winding Trail Hydrant/Cistern	I	7.7	7			300	SFB	1
Pond at Lodge/HF Road	J	6.3	5			300	SFB	1

282.8

Compartment Home Ignition Zones (HIZ) for lots backing up to other lots		Compartment	# lots	Acres				
Winding Trail/HF Road/Hidden Rock	K	6	14	14			HIZ	2
Winding Trail at Yacovoni	L	7	4	7.5			HIZ	2
Serenity Place to HF Road	M	8	5	11.4			HIZ	2
Winding Trail/Waving Branch	N	9	13	12.2			HIZ	2
Waving Branch/Forest Light/Timber Meadow	O	10	13	13.1			HIZ	2
Forest Light/Hidden Rock	P	11	20	15.2			HIZ	2
Wildroot Ct/Forest Light/Mountain Dance	Q	12/14	27	30.4			HIZ	2
Pine Air Pl/Mountain Dance/Timber Meadow	R	15	11	8.5			HIZ	2
Meadow areas		13/16	15				MDW	4
Forested Areas beyond 200' from structures		All	185				FOR	3

Note: Compartments 1-5 back up to open space or outside boundary of HFR. Compartments 13 and 16 are meadows.

Treatment Prescription:

SFB = Shaded Fuel Break Specifications

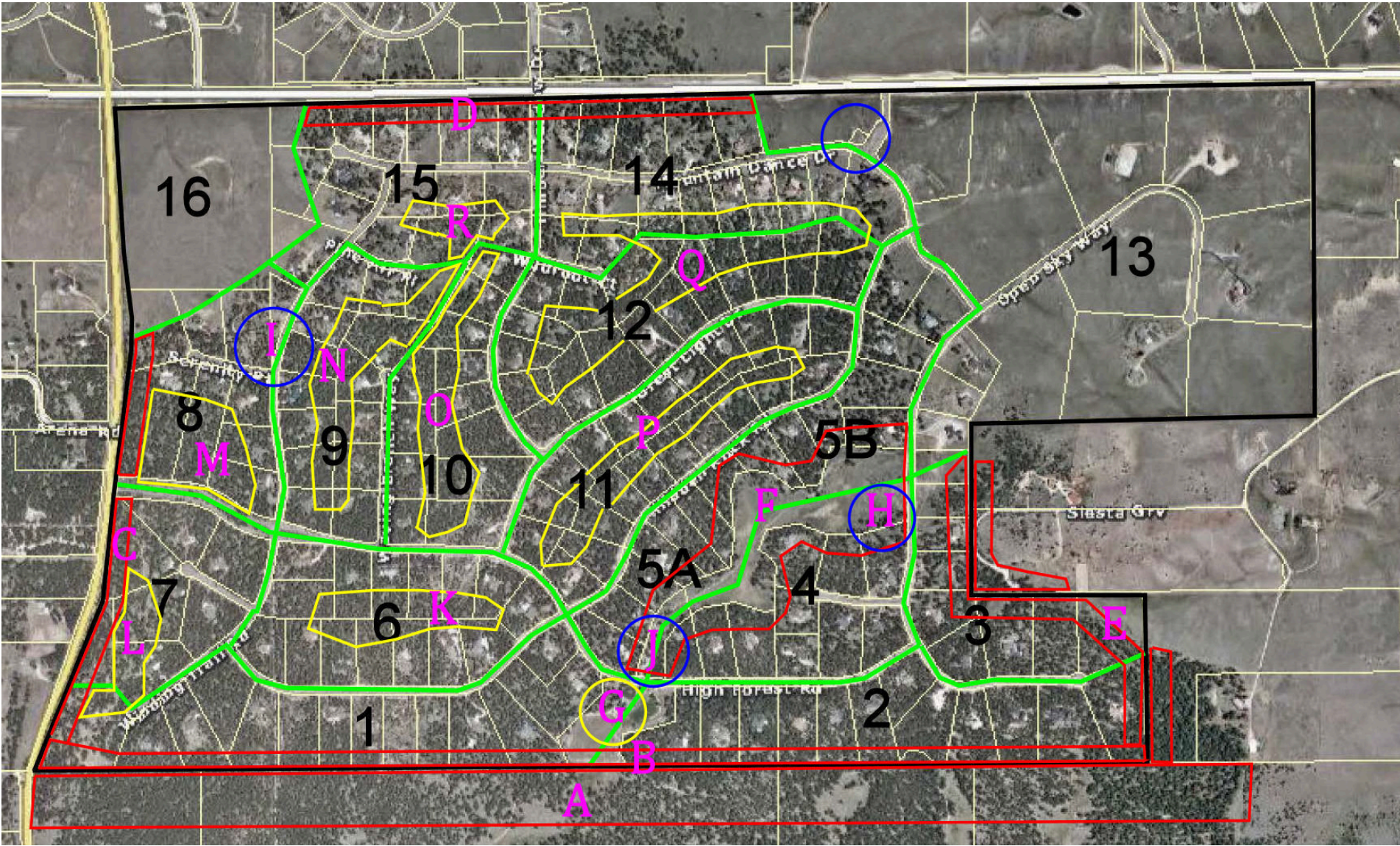
HIZ = Home Ignition Zone 2

FOR = Forestry HIZ Zone 3

MDW = Meadow areas, prairie fuels only



High Forest Ranch Fuel Treatment Areas





High Forest Ranch Critical Intersections for Priority Maintenance



**Appendix B**  
**High Forest Ranch**  
**Action Items**  
**And**  
**Maintenance Schedule**  
**For Long-term Hazard Reduction**

## High Forest Ranch Community Action Plan

During the CWPP process, the following actions were suggested:

Item Descriptions	Date	By
Provide operational authority to DWFPD and BFFRPD for use of the HFR emergency water supplies. This can be in the form of an agreement authorized by the HFR board of directors.	3-20-14	HFRHOA
Develop a community evacuation map for distribution to all residents.		
Install evacuation route signs at the three exits from HFR.		
Develop a template for installation and maintenance of community street signs, light poles, and mail kiosks to prevent damage by wildfire.		
Coordinate with Shamrock Ranch on joint fuel treatment projects along the southern boundary of HFR, including participation in possible grant funding.		
Coordinate with owners in the Farrar Road/Siesta Grove area for possible joint fuel treatment projects.		
Coordinate thinning and/or tree removal with CDOT in the State HWY 83 right-of-way to reduce crown fire potential and remove ladder fuels for fire starts in the roadway.		
Implement at least two demonstration fuel treatments or forestry projects on private lots.		
Develop an overall drainage map showing locations of culverts and major drainage swales that might be impacted by post-fire sediment runoff. Erosion control contractors should be contacted to obtain pricing.		
Implement a "Don't Fence Me In" program, in cooperation with Mountain View Electric Association for all above-ground electrical facilities in HFR.		
Establish community guidelines for Firewise construction, landscaping, and forestry practices in coordination with all HFR committees. These should be updated as needed.		



The following are actions the community can incorporate into its routine budget categories to manage wildfire risks. These are broken down into categories that allow for annual planning and budgeting.

### Seasonal

Activity	Date	By
<b>Mowing:</b>		
-Road sides and roadside ditches- Monthly or as warranted by fire danger.		
-Re-inspect all intersection sight distances for cleared sight triangles.		
-Clear all grasses and fine fuels 3-5 feet from around street signs, light poles and mail box kiosks using weed eaters or non-selective herbicides.		
-Open Spaces- Twice per year		
-First mowing mid-summer after wildflower bloom and before grass curing (browning).		
-Second mowing in the fall after grass curing (to reduce wildfire rate of spread during fall/winter fire season, and allow new, green re-growth in the spring).		
<b>Common Area and Entry Landscaping:</b>		
-Spring cleanup to remove all dead materials (twigs, leaves, needles, etc.).		
-Remove storm damaged trees and branches.		
-Mid-summer re-inspection to again remove fine fuels within 5-10 feet of all combustible materials.		
<b>Education/Awareness:</b>		
-Spring alerts/mailings for:		
-Emergency notification system signups and updates.		
-Family evacuation plans.		
-Home inventories.		
-Home assessments by local fire agencies.		
<b>-Early to mid-Summer:</b>		
-Firewise classes with emphasis on structural ignitability and forest health.		
<b>Implementation:</b>		
-Annual slash disposal program.		
-Consider developing a second seasonal slash disposal effort.		
-Coordinate/facilitate property to property (neighborhood) fuel treatment projects.		

**Annual**

<b>Renew Firewise Community status:</b>	<b>Date</b>	<b>By</b>
-Firewise Day, meeting or special event.		
Coordinate cross-training between all committees (Forestry, Architectural Control, and Fire Mitigation)		
Update annual operating agreements with local fire agencies for emergency use of common areas and water supplies.		
Continue to encourage neighboring property owners to implement lot-to-lot mitigation projects that enhance all home ignition zones (HIZ).		
<b>Review CWPP to determine annual project needs:</b>		
-Apply for grant funding as available.		
Contact all partners to update any wildfire mitigation needs related to critical infrastructure.		
-Mountain View Electric- Power line clearance needs along HWY 83 and Hodgen Road.		
-Utility pedestal clearances inspected to reduce loss or damage by wildfire.		
Colorado Department of Transportation (CDOT) tree removals and pruning along HWY 83.		
-Right-of-way mowing along public roads.		
Inspect all fuel treatment areas to identify any maintenance needs, such as dead tree removal, storm damage cleanup, or insect/disease control.		
Meet with Shamrock Ranch to coordinate fuel treatment projects.		
Coordinate with Wescott Fire on HWY 83 fuel treatment projects.		
Continue community wide educational programs through classes, meetings and annual events. Topics may include:		
-Evacuation Planning.		
-El Paso/Teller 911 program signup (target of 100% participation).		
-Forest Health and related topics.		
-Noxious Weed prevention and control.		
-Wildlife habitat restoration.		
-Insurance coverage for "being made whole again" in the event of home loss.		
-Neighborhood Watch, and "phone trees".		
-Special Needs Populations.		
-Evacuation Planning for Pets and Livestock.		

**Every Three/Five/Ten Years**

Inspect all fuel treatments for:	Date	By
<p>Tree crown closure in all areas:</p> <ul style="list-style-type: none"> <li>-Shaded Fuel Breaks and D-Space Zone 2- 10 feet between crowns (20 feet between crowns of tree clumps).</li> <li>-Forest Health Thinning Areas: (D-Space Zone 3)- 3-5 feet between crowns and/or to allow full sun to tree crowns for optimum tree growth/health.</li> </ul>		
<p>Seedling tree invasion/encroachment:</p> <ul style="list-style-type: none"> <li>-Mow or cut seedling and sapling size trees when located within the dripline of mature trees, or not in full sun locations.</li> <li>-Where trees establish in open areas, thin out trees to promote full crown development, and reduce crowning potential.</li> <li>-Prune as necessary to reduce torching potential.</li> </ul>		

**Appendix C**  
**High Forest Ranch**  
**Firefighter Safety Zone**  
**Guidelines**

**Excerpted from the**  
**National Wildfire Coordinating Group**  
**Fireline Handbook**

## Safety Zone Guidelines

- Avoid locations that are downwind from the fire.
- Avoid locations that are in chimneys, saddles, or narrow canyons.
- Avoid locations that require a steep uphill escape route.
- Take advantage of heat barriers such as lee side of ridges, large rocks, or solid structures.
- Burn out safety zones prior to flame front approach.
- For radiant heat only, the distance separation between the firefighter and the flames must be at least four times the maximum flame height. This distance must be maintained on all sides, if the fire has ability to burn completely around the safety zone. **Convective heat from wind and/or terrain influences will increase this distance requirement.**

### CALCULATIONS ASSUME NO SLOPE AND NO WIND

Flame Height	Distance Separation (firefighters to flame)	Area in Acres
10 ft.	40 ft.	1/10 acre
20 ft.	80 ft.	1/2 acre
50 ft.	200 ft.	3 acres
75 ft.	300 ft.	7 acres
100 ft.	400 ft.	12 acres
200 ft.	800 ft.	50 acres

*Distance Separation is the radius from the center of the safety zone to the nearest fuels. When fuels are present that will allow the fire to burn on all sides of the safety zone this distance must be doubled in order maintain effective separation in front, to the sides, and behind the firefighters.*

*Area in Acres is calculated to allow for distance separation on all sides for a three person engine crew. One acre is approximately the size of a football field or exactly 208 feet x 208 feet.*

# LCES Checklist

LCES must be established and known to  
**ALL** firefighters **BEFORE** needed.

## Lookout(s)

Experienced / Competent / Trusted  
Enough lookouts at good vantage points  
Knowledge of crew locations  
Knowledge of escape and safety locations  
Knowledge of trigger points  
Map / Weather Kit / Watch / IAP

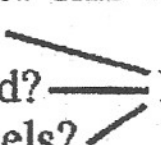
## Communication(s)

Radio frequencies confirmed  
Backup procedures and check-in times established  
Provide updates on any situation change  
Sound alarm early, not late

## Escape Route(s)

More than one escape route  
Avoid steep uphill escape routes  
Scouted: Loose soils / Rocks / Vegetation  
Timed: Slowest person / Fatigue & Temperature factors  
Marked: Flagged for day or night  
Evaluate: Escape time vs. Rate of spread  
Vehicles parked for escape

## Safety Zone(s)

Survivable without a fire shelter  
Back into clean burn  
Natural Features: Rock Areas / Water / Meadows  
Constructed Sites: Clearcuts / Roads / Helispots  
Scouted for size and hazards  
Upslope?   
Downwind?  
Heavy Fuels?  
More heat impact → Larger safety zone

Escape time and safety zone size requirements  
will change as fire behavior changes.



**Appendix D**  
**High Forest Ranch**  
**Firewise Guidelines**

# High Forest Ranch Firewise Guidelines

(Guidelines will be revised periodically to reflect new science, technology, fire department & insurance company guidance)

April 2014

*The goal is to protect our homes, preserve property values and create a healthy forest in High Forest Ranch. We recognize that fire mitigation (or the lack thereof) on any lot can impact the safety and value of adjacent lots and the community as a whole. Therefore, we urge all owners to adopt these minimum guidelines.*

*If you have not done so already, we also recommend you contact the Black Forest Fire Department for a FireWise assessment ([firewise@bffire.org](mailto:firewise@bffire.org)). There is no charge and they will provide customized advice for your property.*

*The primary goal for Firewise landscaping is fuel reduction — limiting the level of flammable vegetation (native and planted) and materials surrounding the home and increasing the moisture content of remaining vegetation. This includes the entire 'home ignition zone' which extends to 200 feet or more on densely treed lots. Zone width is a minimum on flat ground. Zones should be increased downhill on slopes.*



**Zone 1** is the 30 feet adjacent to the home and its attachments. This well-irrigated area encircles the structure and all its attachments (wooden decks, fences, and boardwalks) for at least 30 feet on all sides.

1. Clear roofs and gutters of needles and other flammable debris.
2. Create a 'fuel-free' area within five feet of the home, using non-flammable landscaping materials (i.e., no wood mulch or pine needles) planted with high-moisture-content annuals and perennials.
3. Plants should be carefully spaced, low-growing and free of resins, oils and waxes that burn easily, i.e., no junipers. No shrubs should be planted near windows or foundation vents.
4. Mow the lawn regularly to maintain a grass height of  $\leq 4$ ".
5. Prune conifer trees up ten feet from the ground (always leave the upper two thirds of green branches on shorter trees).  
Note: Ornamental/specimen trees planted by the owner can be mitigated by 3-5' nonflammable area around the tree.
6. Space conifer trees 30 feet between crowns. (Measure crown separation branch tip to tip) Trim back trees that overhang the house.
7. Remove all ladder fuels. Ladder fuels are low branches, shrubs or small trees beneath larger trees that provide a path for ground fire to reach the tree tops.
8. Remove dead vegetation from under deck and within 25 feet of house.
9. Never store firewood, lumber or combustible material underneath or on a deck, even in winter.
10. Consider fire-resistant material for patio furniture, swing sets, etc.
11. Firewood stacks and propane tanks should not be located in this zone.
12. Water plants, trees and mulch regularly.
13. Inspect all zones yearly and maintain as needed to ensure continued effectiveness.

(continued on back)

**Zone 2** is 30 to 100 feet from the home. Plants in this zone should be low-growing, well irrigated, and less flammable. May be modified by owner for pasture areas with Fire Mitigation Committee coordination. Horse lots may manage pasture grass as appropriate for their animals

1. Leave 10 feet of crown separation between individual trees or 20 feet of crown separation between clusters of two to three trees, and remove ladder fuels. (Measure crown separation branch tip to tip)
2. Remove accumulation of woody debris or deadwood.
3. Encourage a mixture of deciduous and coniferous trees.
4. Extend zone 2 along the entire length of driveways for a width of 30 feet from each edge of the drive. Create 'fuel breaks', like driveways, gravel walkways and lawns.
5. Prune conifer trees up ten feet from the ground (or at least 1/3 the way up for short trees).  
Note: Ornamental/specimen trees planted by the owner can be mitigated by nonflammable 3-5' area around the tree
6. Remove smaller conifers that are growing between taller trees.
7. Trees to remove should be small diameter trees crowded or overtopped by dominant trees.
8. Mow grass at  $\leq 6''$  to reduce ground fire fuel.

**Zone 3** is 100 feet to the property line. Thin this area to create a healthy forest, although less space is required than in Zone 2. **This standard also applies to all vacant lots.** Many thinning strategies can be employed in this zone to achieve the owner's objectives. Consultation with a qualified forester is recommended to determine the best management strategy. May be modified by owner for pasture areas with Fire Mitigation Committee coordination. Horse lots may manage pasture grass as appropriate for their animals.

1. Reduce the density of tall trees so there is 3-5 feet between crowns. (Measure crown separation branch tip to tip)
2. Remove accumulation of woody debris or deadwood.
3. Prune conifer tree branches to eliminate any foliage within 8-10 feet of the ground.  
Note: Ornamental/specimen trees planted by the owner can be mitigated by 3-5' nonflammable area around the tree
4. Remove smaller conifers that are growing between taller trees.
5. Trees to remove should be small diameter trees crowded or overtopped by dominant trees.
6. Strive to create a diverse forest with a variety of tree ages.
7. Mow grass at  $\leq 6''$  to reduce ground fire fuel.

**Note:** If perimeter lots are not mitigated to Zone 3 standards, for your protection, you should apply Zone 2 standards for at least 100 feet inside your perimeter.

### **Lightly wooded or meadow areas.**

1. Mow grass at least annually to  $\leq 6''$  to reduce ground fire fuel. Horse lots may manage pasture grass as appropriate for their animals.
2. Remove accumulation of woody debris or deadwood.

**NOTE:** Removal of any trees with a trunk diameter  $>5$  inches requires HFR Forestry Committee approval. Contact Z&R Management to request an inspection and approval.

**Appendix E**  
**Wildfire History**  
**For the El Paso County Area**

## Fire History

Numerous scientific studies indicate that the typical fire regime in the lower montane zone, including the Black Forest area, was one of mixed severity fires. The term means that, before fire suppression in the twentieth century, frequent, low intensity fires were the norm, but occasional high intensity fires did occur. Typically, low intensity fires occurred every 20 to 30 years. Frequent fires cleansed the area of fuel and thinned the vegetation. The forest management proposed in this plan will duplicate the natural low intensity fire regimen.



GREEN MOUNTAIN FALLS CA. 1890. NOTICE HOW THE HILLS IN THE BACKGROUND ARE DENUDE FROM THE BIG BURN IN 1854. PHOTO COURTESY OF THE UTE PASS HISTORICAL SOCIETY



The recorded history of fires in the area is incomplete. It is a quirk of human memory that large fires are recorded while the smaller fires are forgotten. The early fire history of the area consists of the large fires that remained fixed in people's memories long after the event.

The first recorded fire in the area was the so called Big Burn of 1854. According to trappers who were in the area at the time, the fire was started on the south flank of Cheyenne Mountain by Arapahoe or Cheyenne Indians to drive the Utes from the area's hunting grounds.

The fire burned along the eastern face of the Rampart Range and up Fountain Creek Cañon. Some accounts say it burned as far as Wilkerson Pass. Old maps made in the 1890s show severely burned areas throughout the entire Pike National Forest.

El Paso County records list another fire on Cheyenne Mountain in 1890, started from burning brush on the Bush Ranch. Four hundred acres were burned, and the fire was eventually extinguished by a snow storm.<sup>1</sup>

In 1950, a fire broke out on Fort Carson. Nine people, including a 14 year old volunteer firefighter, died as a result of the fire, and property loss was estimated in excess of three million dollars.<sup>2</sup>

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<sup>1</sup> Wegner, Rebecca (2004). *North Cheyenne Cañon Park and Stratton Open Space: Forest Health Assessment and Management Plan*. Colorado Springs Parks Recreation and Cultural Services.

<sup>2</sup> Russell, Kathy. (2011) *Community Wildfire Protection Plan for Unincorporated El Paso County*. El Paso County Sheriff's Office, Emergency Services Division.



As record keeping became more thorough, more small fires are documented in wildland urban interface areas. Later records show many smaller fires, not only in the foothills, but also in wooded enclaves within urban areas. Most of these were controlled quickly with little or no damage to structures.

Sometime in the 1950's there are unconfirmed stories of a significant fire in the Black Forest area, but there seems to be no historical documentation. Occasional fire scared trees in the area confirm that there were fires in the area.

The first recorded fire in the modern era was the April 1990 Berry Fire south west of Monument. The fire started in Gambel Oak south of the Monument Fire Center and burned rapidly to the top of the Rampart Range. The fire scar is still visible.

On April 28, 2002, a resident of Pine Glen was mowing his field when dry grass was ignited by the muffler of the mower. Fortunately westerly winds blew the Pine Glen Fire onto the Pineries Ranch (now the El Paso County Pineries Open Space) and away from any homes. The fire burned 64 acres before it was controlled.

Two days later another fire broke out in the Glen area of Palmer Lake. It was quickly controlled, but could have been a tragic fire in a neighborhood that was choked with Gambel oak and homes built in the early years of the twentieth century. Several days later, juveniles playing with matches, ignited another fire in Gambel oak near houses at the west end of Baptist Road. Quick response and air support again prevented a tragedy. These fires were only a prelude to the June 2002 Hayman Fire.

Two years of severe drought preceded the tragedy of the Waldo Cañon Fire, and the fire ignited on a hot, dry day with strong winds. The Cedar Heights neighborhood above Garden of the Gods was first threatened, but a combination fuel breaks and defensible spaces completed by residents in previous years allowed firefighters to keep the fire out of that community.

On June 26<sup>th</sup>, 2012, strong downslope winds pushed the fire into the Mountain Shadows area. In a few short hours, two lives were lost, and 392 homes destroyed. The value of property lost is currently estimated as 350 million dollars, and the cost of suppression was \$20, million. An additional \$5 to 9 million will spent in on rehabilitation in the next few months but the true cost will take years to determine<sup>3</sup>. Even after the flames are extinguished, the costs restoration, flooding and environmental damage continue to mount.

***“If you look at the Colorado Front Range as a whole, [the Waldo Cañon Fire] was not epic or unprecedented; it was just in a new location”***

***--Rick Stratton***

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<sup>3</sup> Carol Ekarius, Executive Director, Coalition for the Upper South Platte. 2013. Personal Communication.

Shortly after the Waldo Cañon Fire, Rick Stratton, Long-Term Fire Analyst for the USDA, Forest Service, published a preliminary report on the causes of home destruction in Mountain Shadows.<sup>4</sup> He reached these conclusions:

“ . . . [I]n the lower portion of Mountain Shadows, several things were apparent. (1) Home destruction was largely house-to-house due to overlapping [home ignition zones (HIZ)]. Therefore, if a home was burning, the adjacent home had a shared HIZ and in turn was in jeopardy. Similar to dominos, the destruction sequence ceased only when the fuel was absent (e.g., a road or vacant lot) or suppression efforts were successful. This destruction sequence was channeled and intensified by the wind. (2) Homes with flammable wood roofs were a large target and receptive fuel for firebrands. In some cases these homes initiated the house-to-house destruction and extended the reach of the fire further into the subdivision through thermal exposure and the lofting of burning debris to adjacent homes and vegetation. (3) Firefighters were overwhelmed in their attempt to prevent the residential fire spread due to multiple homes burning simultaneously. However, more homes would have been burned without their intervention.

“ . . . Homes farther up the hill are generally newer and spaced farther apart. Roofs are mostly tile or asphalt. Due to these two factors (non-ignitable roofs and separation distance), house-to-house destruction was lessened, but still evident (e.g. Brogans Bluff Dr.). One consistent way homes were ignited was from their decks that extended into the vegetated areas behind homes. These natural corridors ran parallel with the slope and acted as a fuse. Because the vegetation was part of the HIZ and the attached deck was part of the home, the fire made the transition to the home. Like lower Mountain Shadows, it was evident that firefighting efforts saved several homes.”

The Black Forest Fire is so fresh in the community’s memory that a long elaboration of that tragedy is unnecessary. Although the flames are extinguished, the fire is a current tragedy not a historical one. No one needs to be reminded what happened;

While the history of the Black Forest Fire may be incomplete there has been a thorough analysis of the effectiveness of mitigation by the Pikes Peak Wildfire Prevention Partners.<sup>5</sup> The report found that individual mitigation on small lots was often overwhelmed by the untreated fuels adjoining them, but in communities where mitigation was done on a landscape level the fire did minimal damage.

The report cited Cathedral Pines as a

***“Community wide mitigation was found to be most effective in managing wildfire; even during extreme burning conditions. . . Firefighters were able to safely defend structures as the fire swept through the [Cathedral Pines] community”***

***-- Black Forest Fire Assessment Team:  
Report to the Governor of Colorado***

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<sup>4</sup> Stratton, Rick. (2012). *The Waldo Canon Fire: Fires on the Colorado Front Range and Home Destruction*. Pike and San Isabel National Forests.

<sup>5</sup> Pikes Peak Wildfire Prevention Partners in Cooperation with the Black Forest Fire and Rescue Department and Falcon Fire Department. 2014. *Black Forest Fire Assessment Team Report to the Governor of Colorado*. Published at [www.ppwpp.org](http://www.ppwpp.org)

successful example of community fire mitigation. Although the fire burned through two thirds of the community only one structure, located adjacent to unmitigated fuel outside the community, was burned. Not only did the homes survive, but fire damage to the forest was minimal and the forest recovered quickly.

The fire history of the region tells us that fire is as much a part of the natural environment as the trees themselves. After a century of fire exclusion, forests are thicker and more crowded with fuel to the point that wildfires are ever more difficult to control. Firefighters will always strive to protect lives and property, but their effectiveness depends on the foresight and preparation of landowners in advance of the fire.

# **Appendix F**

## **Glossary**

## Appendix F

### Glossary

**Abiotic Factors:** The non-living components of the environment, such as air, rocks, soil, water, peat, and plant litter.

**Afforestation:** The establishment of trees on an area that has lacked forest cover for a very long time, or has never been forested.

**Aerial fuels:** Standing and supported live and dead combustibles not in direct contact with the ground and consisting mainly of foliage, twigs, branches, stems, cones, bark, and vines: typically used in reference to the crowns of trees.

**Cambium:** A single layer of cells between the woody part of the tree and the bark. Division of these cells result in diameter growth of the tree through formation of wood cells (xylem) and inner bark (phloem).

**Canopy:** The forest cover of branches and foliage formed by tree crowns.

**Chain:** A measuring tape, often nylon, 50 meters or 75 meters in length, used to measure distances. This term is derived from an old unit of measurement (80 Chains = 1 mile).

**Chimney:** A topographical feature such as a narrow drainage on a hillside or the upper end of a box canyon that could channel wind, smoke or flames up the slope; acting as a fireplace chimney would to draw smoke and heat upward.

**Class A Roof:** Effective against severe fire test exposures, as classified by the Universal Building Code (UBC). Under such exposures, roof coverings of this class are not readily flammable, afford a fairly high degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brands.

**Class B Roof:** Effective against moderate fire test exposures, as classified by the Universal Building Code (UBC). Under such exposures, roof coverings of this class are not readily flammable, afford a moderate degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brands.

**Class C Roof:** Effective against light fire test exposure, as classified by the Universal Building Code (UBC). Under such exposures, roof coverings of this class are not readily flammable, afford a measurable degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brands.

**Clearcut:** An area of forest land from which all merchantable trees have recently been harvested.

**Climax Forest:** A forest community that represents the final stage of natural forest succession for its locality, i.e. for its environment.

**Coarse Woody Debris (CWD):** Sound and rotting logs and stumps that provide habitat for plants, animals, and insects, and a source of nutrients for soil development.

**Colorado Champion Tree:** The largest known tree of its species in the state. Trees are ranked by a point system based on three measurements: trunk circumference in inches at 4.5 feet above the ground, tree height in feet, and the average crown spread in feet.



**Commercial Thinning:** A silviculture treatment that "thins" out an overstocked stand by removing trees that are large enough to be sold as poles or fence posts. It is carried out to improve the health and growth rate of the remaining crop trees.

**Competing Vegetation:** Vegetation that seeks and uses the limited common resources (space, light, water, and nutrients) of a forest site needed by preferred trees for survival and growth.

**Conifer:** Cone-bearing trees having needles or scale-like leaves, usually evergreen, and producing wood known commercially as "softwoods."

**Conservation:** Management of the human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. It includes the preservation, maintenance, sustainable utilization, restoration, and enhancement of the environment.

**Crown fire / Crowning:** A form of extreme wildland fire behavior consisting of fire that advances from top to top of trees or shrubs more or less independent of a surface fire. Crown fires are sometimes classed as running or dependent to distinguish the degree of independence from the surface fire.

**Deciduous:** Perennial plants that are normally leafless for some time during the year.

**Defensible Space:** An area within the perimeter of a parcel, development, neighborhood, or community where basic wildland fire protection practices and measures are implemented, providing the key point of defense from an approaching wildfire or defense against encroaching wildfires or escaping structure fires. The perimeter as used herein is the area encompassing the parcel or parcels proposed for construction and/or development, excluding the physical structure itself. The area is characterized by the establishment and maintenance of emergency vehicle access, emergency water reserves, street names and building identification, and fuel modification measures. In simplest terms, it is adequate space between structures and flammable vegetation which allows firefighters a safe working area from which they can attack an oncoming wildfire. Defensible Space is the best element of fire protection for individual property owners.

**Defoliator:** An agent that damages trees by destroying leaves or needles.

**Dripline:** The outer most leaves on a tree defines its dripline and the ground within the dripline is known as the drip zone; also defined as the area defined by the outermost circumference of a tree canopy.

**Deforestation:** The removal of a forest stand where the land is put to a non forest use.

**Eave Opening:** A vent located in an eave or soffit which allows airflow into the attic and/or walls of a structure.

**Ecosystem:** A functional unit consisting of all the living organisms (plants, animals, microbes) in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size a log, pond, field, forest, or the earth's biosphere but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation; for example, forest ecosystem, old-growth ecosystem, or range ecosystem.

**Escape route:** A preplanned and understood route firefighters take to retreat from an unsafe or fire-threatened area and move to a safety zone or other low-risk area.

**Extreme fire behavior:** A level of fire behavior that ordinarily precludes firefighting methods involving direct attack on the fire. One or more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

**Felling:** The cutting down of trees.

**Firebrands:** Flaming or glowing fuels lofted into the air during intense burning by strong upward convection currents. Also referred to as airborne embers.

**Fire break:** A natural or constructed fuel-free barrier used to stop or check fires that may occur, or to provide a control line from which to work.

**Fire front / Flame front:** The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified, the fire front is assumed to be the leading edge of the fire perimeter.

**Fire Dependent:** Requiring one or more fires of varying frequency, timing, severity, and size in order to achieve optimal conditions for population survival or growth.

**Fire Hazard Mitigation:** Various methods by which existing fire hazards can be reduced in a certain area, such as fuel breaks, non-combustible roofing, spark arresters, etc.

**Fire Management:** The activities concerned with the protection of people, property, and forest areas from wildfire and the use of prescribed burning for the attainment of forest management and other land use objectives, all conducted in a manner that considers environmental, social, and economic criteria.

**Fire Suppression:** All activities concerned with controlling and extinguishing a fire following its detection.

**Firewise:** A National Fire Protection Association's (NFPA) program encouraging local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks.

**Forest Fire:** Any wildfire or prescribed burn that is burning in forest, grass, alpine, or tundra vegetation types.

**Forest Type:** A group of forested areas or stands of similar composition (species, age, height, and stocking) which differentiates it from other such groups.

**Fuel:** Any living or dead material that will burn.

**Fuel break:** An existing barrier or change in fuel type (to one that is less flammable than that surrounding it) or a wide strip of land on which the native vegetation has been modified or cleared, that acts as a buffer to fire spread so that fires burning into them can be more readily controlled. Often selected or constructed to protect a high value area from fire.

**Fuel Management:** The act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire in support of land management objectives.

**Fuel reduction zone:** An area similar to a fuel break but not necessarily linear, in which fuels have been reduced or modified to reduce the likelihood of ignition and/or to reduce fire intensity thereby lessening potential damage and resistance to control.

**Germination:** The development of a seedling from a seed.

**Home Ignition Zone (HIZ):** An area including the home and its immediate surroundings within which burning fuels could potentially ignite the structure; usually considered to be an area extending out roughly 100 feet from the home. The HIZ is often used to describe the area in which fuel modification measures should be taken to protect the home.

**Ladder Fuels:** Fuels that provide vertical continuity between the surface fuels and crown fuels in a forest stand, thus contributing to crown fires.

**Lines of Effort:** Tasks sets or sets of actions that are linked or coordinated with other task sets to accomplish a larger mission or reach a desired end state. Lines of effort allow leaders and decision makers to direct a variety of separate actions toward a unified result.

**Maximum Density:** The maximum allowable stand density above which stands must be spaced to a target density of well-spaced, acceptable stems to achieve free-growing status.

**National Fire Protection Association (NFPA):** A private, non-profit organization dedicated to reducing fire hazards and improving fire service.

**Phloem:** A layer of tree tissue just inside the bark that conducts food from the leaves to the stem and roots.

**Pitch Tubes:** A tubular mass of resin that forms on bark surface at bark-beetle entrance holes.

**Prescribed Burning:** Controlled application of fire to wildland fuels, in either their natural or modified state, under certain conditions of weather, fuel moisture, soil moisture, etc. as to allow the fire to be confined to a predetermined area and at the same time to produce results to meet planned land management objective.

**Ready, Set, Go (RSG):** A program, managed by the [International Association of Fire Chiefs \(IAFC\)](#), seeking to develop and improve the dialogue between fire departments and residents. The program helps fire departments teach individuals who live in high-risk wildfire areas how to best prepare themselves and their properties against fire threats.

**Regeneration:** The act of renewing tree cover by establishing young trees, naturally or artificially note regeneration usually maintains the same forest type and is done promptly after the previous stand or forest was removed.

**Saddle:** A depression, dip or pass in a ridgeline; significant in wildland firefighting because winds may be funneled through a saddle, causing an increase in wind speed.

**Safety zone:** An area essentially cleared of flammable materials, used by firefighters to escape unsafe or threatening fire conditions. Safety zones are greatly enlarged areas in which firefighters can distance themselves from threatening fire behavior without having to take extraordinary measure to shield themselves from fire/heat.

**Sapwood:** The light-colored wood that appears on the outer portion of a cross-section of a tree.

**Serotinous:** Pertaining to fruit or cones that remain on a tree without opening for one or more years note in some species cones open and seeds are shed when heat is provided by fires or hot and dry conditions.

**Shaded fuel break:** A fuel break built in a timbered area where the trees within the break are thinned and limbed up to reduce crown fire potential, yet retain enough crown canopy to provide shade, thereby making a less favorable microclimate for surface fires.

**Silviculture:** The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.

**Snag:** A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

**Stand:** A continuous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.

**Spot Fire / Spotting:** Fires ignited beyond control lines or outside the perimeter of a fire by firebrands landing on/among flammable material. Spot fires/spotting are a form of extreme fire behavior typically resulting from high wind conditions.

**Structure protection:** A defensive strategy in wildland firefighting in which firefighters are assigned to evaluate, prepare and, when possible, defend structures/homes that may be threatened by a wildfire.

**Structure triage:** Evaluating and sorting structures/homes into categories based on their relative likelihood of surviving a wildland fire threat (*defensibility*). Triage decisions are based multiple factors and conditions occurring during an actual fire - weather, fire behavior, home ignition potential, defensible space, presence of escape routes, and availability of firefighting resources, among others - with the goal of doing the most good with the resources available.

**Succession (or Ecological Succession):** The replacement of one plant and/or animal species over time by another in progressive development toward climax vegetation.

**Surface fuels:** Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low-lying live vegetation.

**Survivable space:** A term typically used to describe the area around a structure/home indicating that fuels in the area have been reduced to the point that there is little or no serious fire threat to the structure; the structure has a high probability of surviving a wildland fire without anyone on scene providing active protection.

**Thinning:** A cutting made in an immature crop or stand primarily to accelerate diameter increment, but also, by suitable selection, to improve the average form of the tree that remain.

**Torching:** The burning of the foliage of a single tree or a small group of trees, from the bottom up. Sometimes, also called candling. Torching is an extreme form of fire behavior, similar to but less extreme than crowning in that crowning affects larger numbers, even entire stands of trees.

**USDAFS:** United States Department of Agriculture - Forest Service, what is commonly known as just "The Forest Service"

**Windbreak:** A strip of trees or shrubs maintained mainly to alter wind flow and microclimates in the sheltered zone, usually farm buildings.

**Wildland-Urban Interface or Wildland-Urban Intermix (WUI):** The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Although *Interface* is the more general, more commonly used term; it technically refers specifically to the area where

development and wildlands meet. ***Intermix*** indicates the presence of wildland vegetation/fuels intermingled throughout the developed area.