Sangres Foothills
Community Wildfire Protection Plan

February 22, 2018

Prepared By

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And

Wet Mountain Fire Department
And
Custer County Office of Emergency Management

In Cooperation With:
Colorado State Forest Service

ACCEPTANCE

The Sangres Foothills 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 the Wet Mountain Fire Protection District (District) and Custer County (County) stewardship management activities, including wildfire protection. The activities recommended in this plan are appropriate to meet District and County objectives and will benefit the natural resources and reduce the risk from wildland fire. This plan is voluntary, and where possible, the District and County intend to apply the recommended practices, thus improving community preparedness, and increasing public safety.

The CWPP has been reviewed and approved by the Sangres Foothills CWPP Core Team.

_____ _____
Cindy Howard, Director Date
Custer County Office of Emergency Management

_____ _____
Shannon Byerly
Custer County Sheriff Date

_____ _____
John Grieve, District Forester Date
Colorado State Forest Service

_____ _____
Basil Lane
Asst. Fire Chief, WMFPD, Wildland Fire Coordinator Date

_____ _____
Paul M Crespin
San Carlos District Ranger, USDA Forest Service Date

_____ _____
Field Manager, USDI Bureau of Land Management Date

Sangres Foothills CWPP Updates/Amendments		
Change	**Date**	**Comments**
Original		**Approved at Core Team meeting,**

NOTE: Amendments to this plan must be approved by Custer County Emergency Manager, Colorado State Forest Service and Wet Mountain Fire Protection District.

Forward

The experience of the last several fire seasons, sustained drought conditions, disease and the ever-increasing number of homes constructed in the Wildland-Urban Interface (WUI) make future wildfires in the Wet Mountain Fire Protection District (District) and Custer County (County) a near certainty. All residents and property owners of the County have a personal responsibility to understand the linkage between forest stewardship, their personal safety, that of their neighbors and our firefighters.

With future fires a 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, *Protecting Your Home From Wildfire: Creating Wildfire Defensible Zones* FIRE 2012-1, and other Firewise recommendations found at 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 fuel volumes.
- Risk management as opposed to an unrealistic expectation of risk elimination.

Consensus:

- Standards for fuel reduction intended to protect life, property and natural resources.
- Adoption of an overall Plan (CWPP) to address/manage wildfire risks.
- Breaking through deeply-held cultural values and beliefs that prevent residents 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 the County.
- Working together to take advantage of any outside financial assistance or programs to meet stated fuels modification.
- 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 the study area unique.

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Appendices:

Introduction

The CWPP study area has been impacted by multiple wildfires, including the 2011 Duckett and 2016 Hayden Pass wildfires. The fires burned with high-intensity as crown fires. No homes were lost in the county by either fire, although homes in Fremont County were lost during the 2016 Hayden Pass wildfire. Numerous properties, however, were impacted by the fires. It should be noted that both fires burned for extended periods of time and that the fire spread direction spared significant impacts to structures. The study area's residents must continue to reduce their ladder fuels and increase tree crown separation to survive a high intensity wildfire, and develop and take advantage of any slash disposal programs.

The study area, in an effort to be proactive, has begun to establish some fuel treatments in the area, and the fire district has begun a voluntary homeowner evaluation program within high risk neighborhoods, for a nominal fee.

Objectives of the plan are:

- To protect life, property and natural resources of the CWPP study area.
- To protect lifestyle and shared community values.
- Continue to identify values that need to be protected within the study area.
- To restore and protect the forests of the study area.
- To protect homeowner access to affordable insurance.
- To reduce wildfire risks in the County.
- To develop partnerships with those that can have an influence on the wildfire risk. To provide for the safety of firefighters and allow them to be more effective in protecting us.
- To collaborate with adjoining fire departments, USDA Forest Service and Custer County to mitigate wildfire hazards on a landscape level.

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.[1]

The CWPP process will cover:

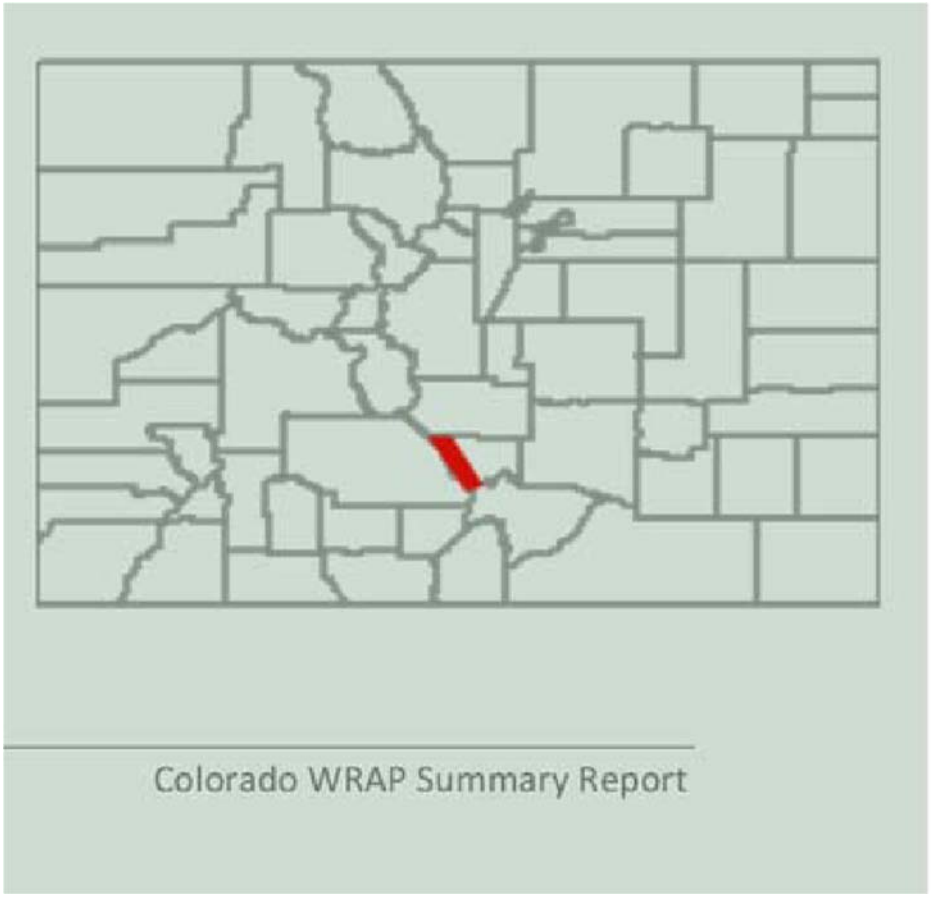
- **Assessment:**
  - Carry out a general community assessment and an analysis of community fire mitigation capacity;
- **Education and Preparedness:**
  - Develop community education and preparedness initiatives about wildfire behavior and mitigation;
- **Mitigation planning**
  - Engage in community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

[1] Preparing a Community Wildfire Protection Plan, National Association of State Foresters, et al, March 2004.

COMMUNITY IDENTIFICATION AND DESCRIPTION

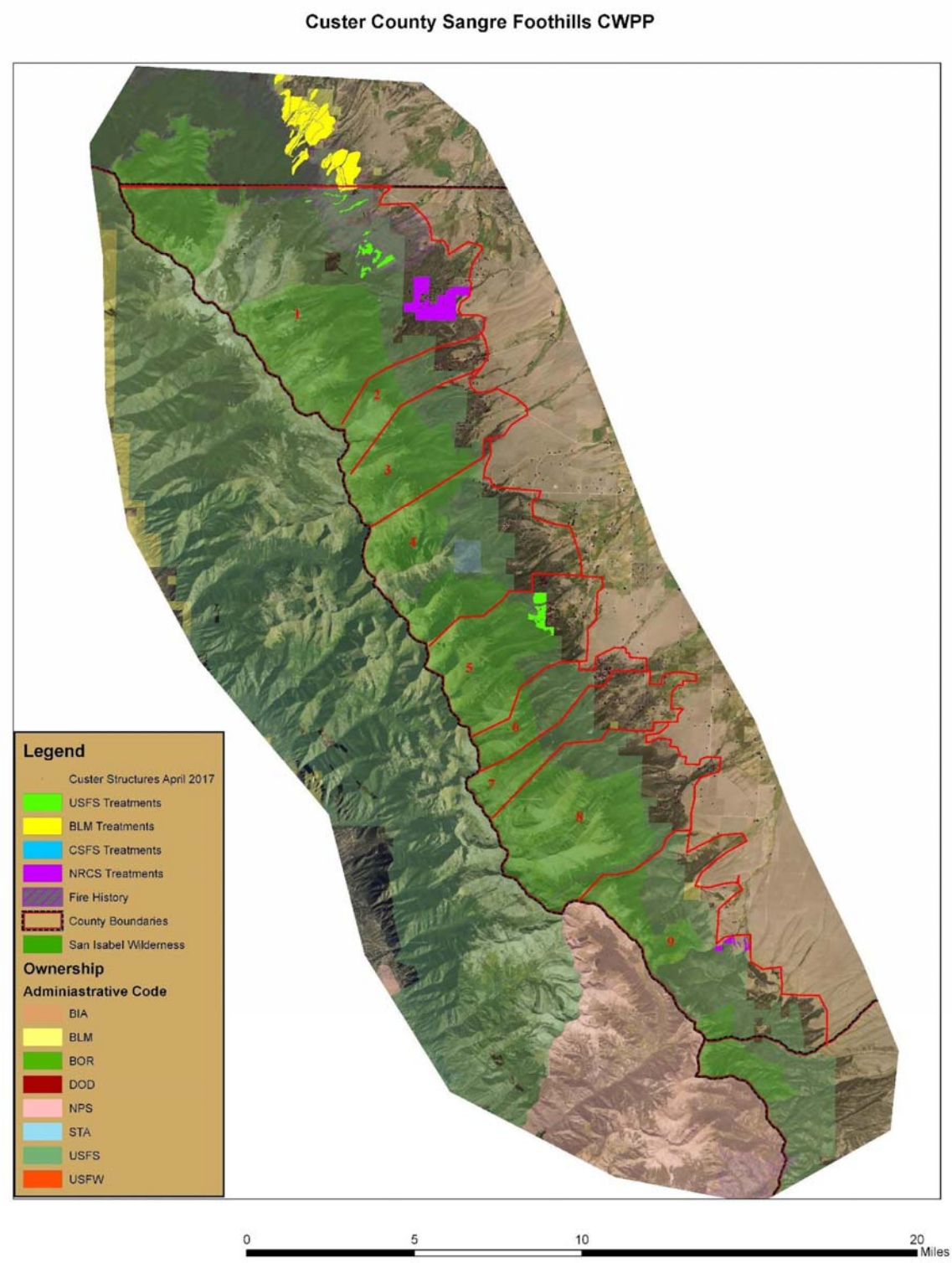
Location and General Description

The CWPP study area is in the western portion of unincorporated Custer County, Colorado.



Vicinity Map of Sangres Foothills CWPP

The west boundary is the top of Sangre de Cristo Mountains. The east boundary is the Wet Mountain Valley. North and south boundaries are the Custer County lines.

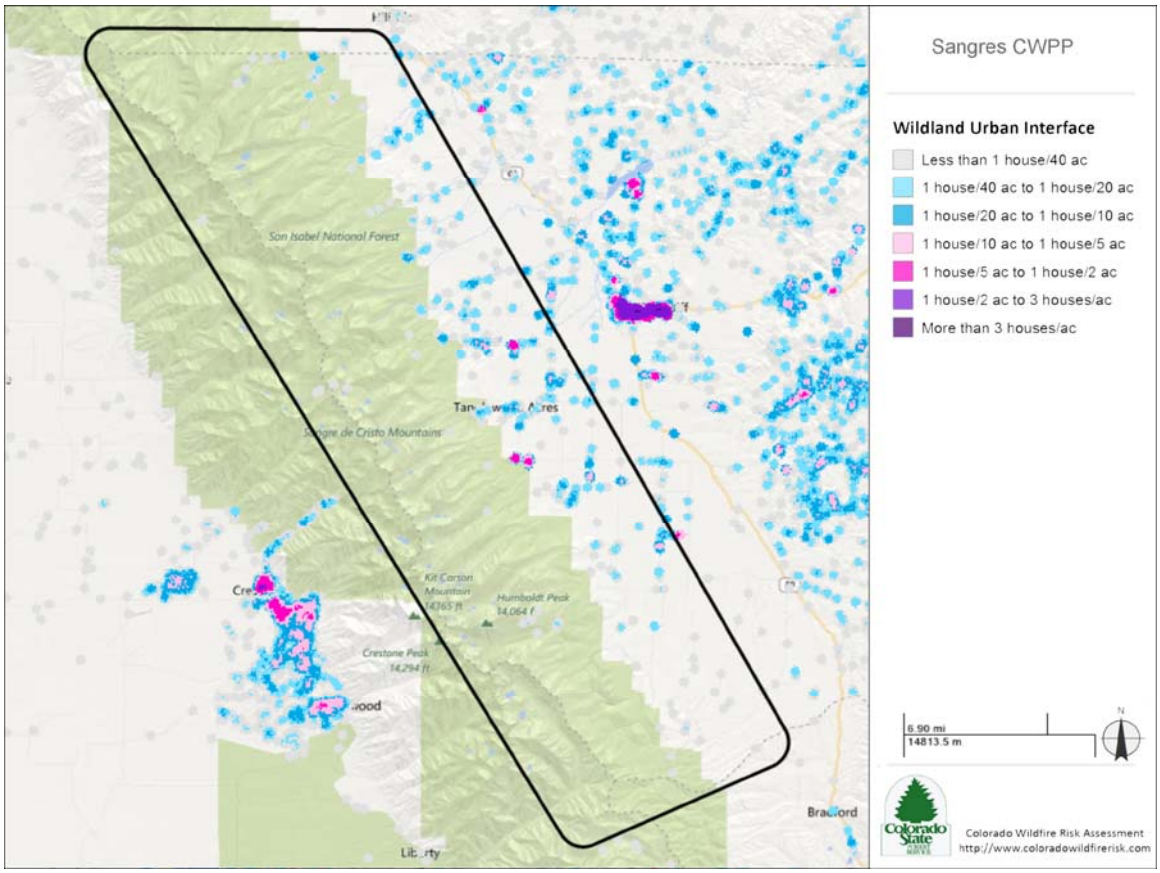


Study Area Map showing location of Sangres Foothills CWPP

The study area is comprised of private lands and abuts the San Isabel National Forest. Primary transportation routes are State Hwy 69. With the exception of Hwy 69, most main roads are operated and maintained by Custer County.

CWPP Demographics

The Sangres Foothills contains 881 privately owned parcels, with over 827 structures//dwellings. Three conference centers and one seminary are present. Guest populations surge from Memorial Day to Labor Day and include a high number of seasonal campers, backcountry and day users in the USFS. Most of the residences are seasonal use structures. Agricultural properties make up the highest percentage of acreage.

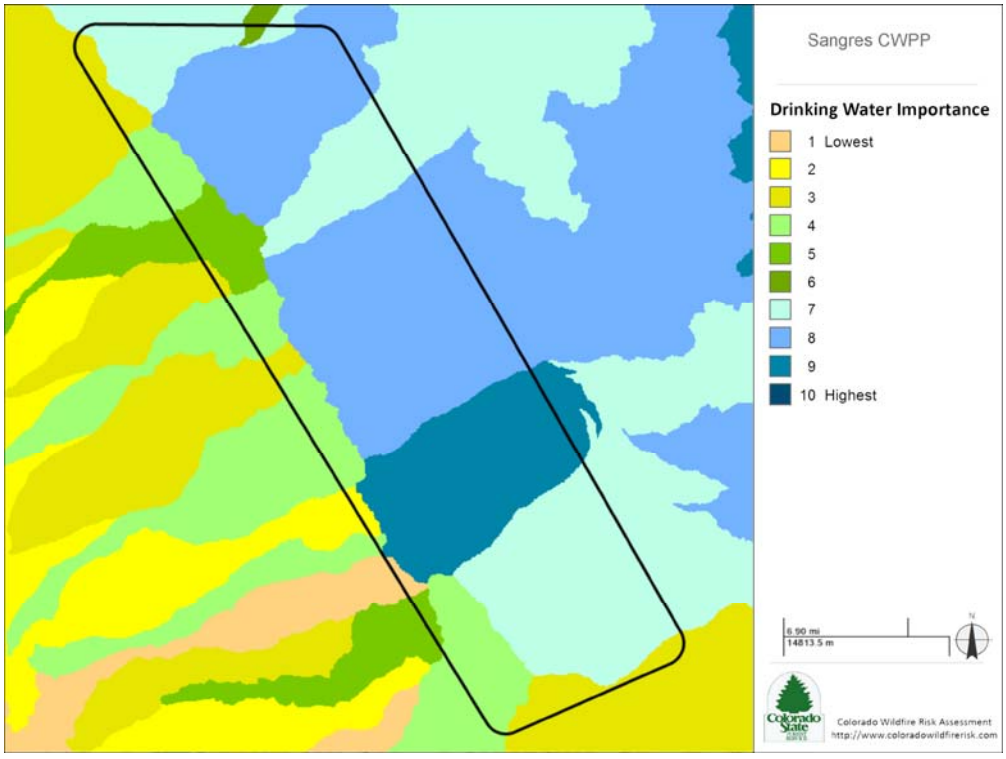


Structure Distribution and Property Sizes

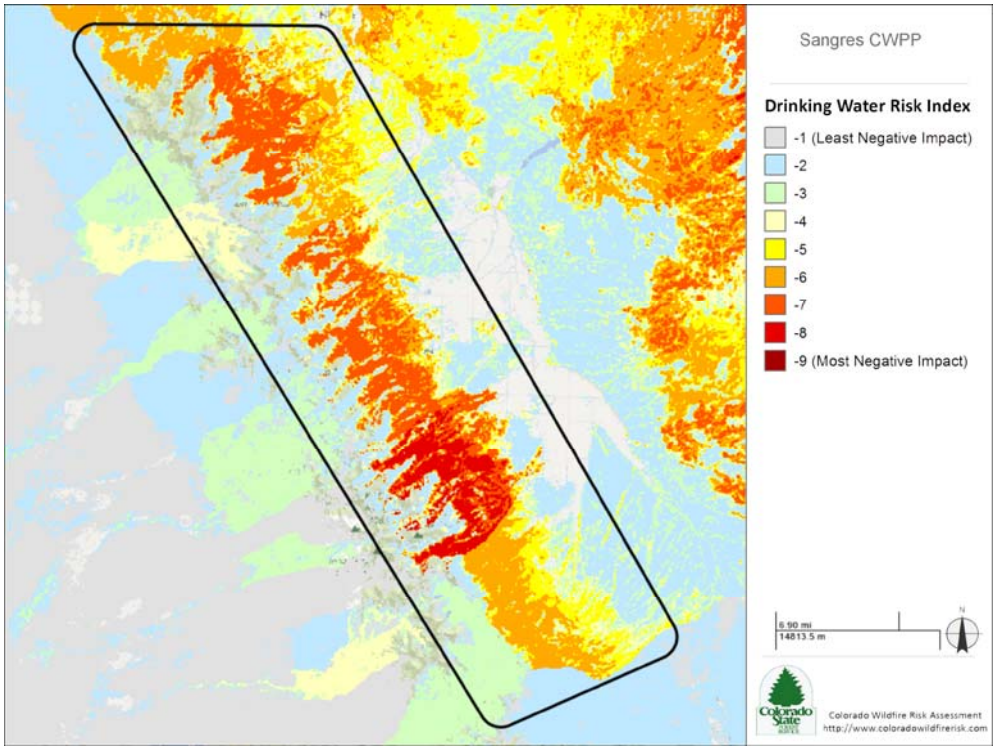
COMMUNITY ASSESSMENT

Community Values at Risk

The number one asset in the study area is the forest. This asset provides three main values. The first is the aesthetic value, which supports tourism in the area. The second value, property value, is directly related to lot costs and home resale values for forested properties. The third value is renewable water. Water, for domestic and agricultural uses, is the most valuable resource from the watersheds west of the CWPP area. Other less tangible values include wildlife habitat, view corridors, and privacy.



Drinking Water Importance



Drinking Water Risk Index

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 yellow outlined area on the map on page14, was set at the CWPP boundaries. Three zones have been identified. These are:

- Zone 1- Communities within the study area.
- Zone 2- Wildfire impact areas abutting communities, primarily public lands. A minimum ¼ to ½ mile wide area will be a high priority for treatments due to potential crown fire spread and ember outwash from this zone into the community. It should be noted that embers generated outside of the community can also impact residents.[2]
- Zone 3- Wildfire influence zone beyond ¼ mile from communities. Wildfires from this zone can exhibit extreme fire behavior that continues into zones 1 and 2, with little or no potential for containment or control.

Ninety-eight percent of wildfires are typically contained or controlled within the first or second burning period.[3] The Duckett, Hayden Pass, and Junkins Fires fit into the remaining two percent of fires that exceeded the suppression capacity of fire service control due to extreme

[2] Framework for Addressing the NationalWildland 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

[3] *Assessing Wildfire Hazards in the Home Ignition Zone*, NFPA, 2010, Publication FWC93710PKD

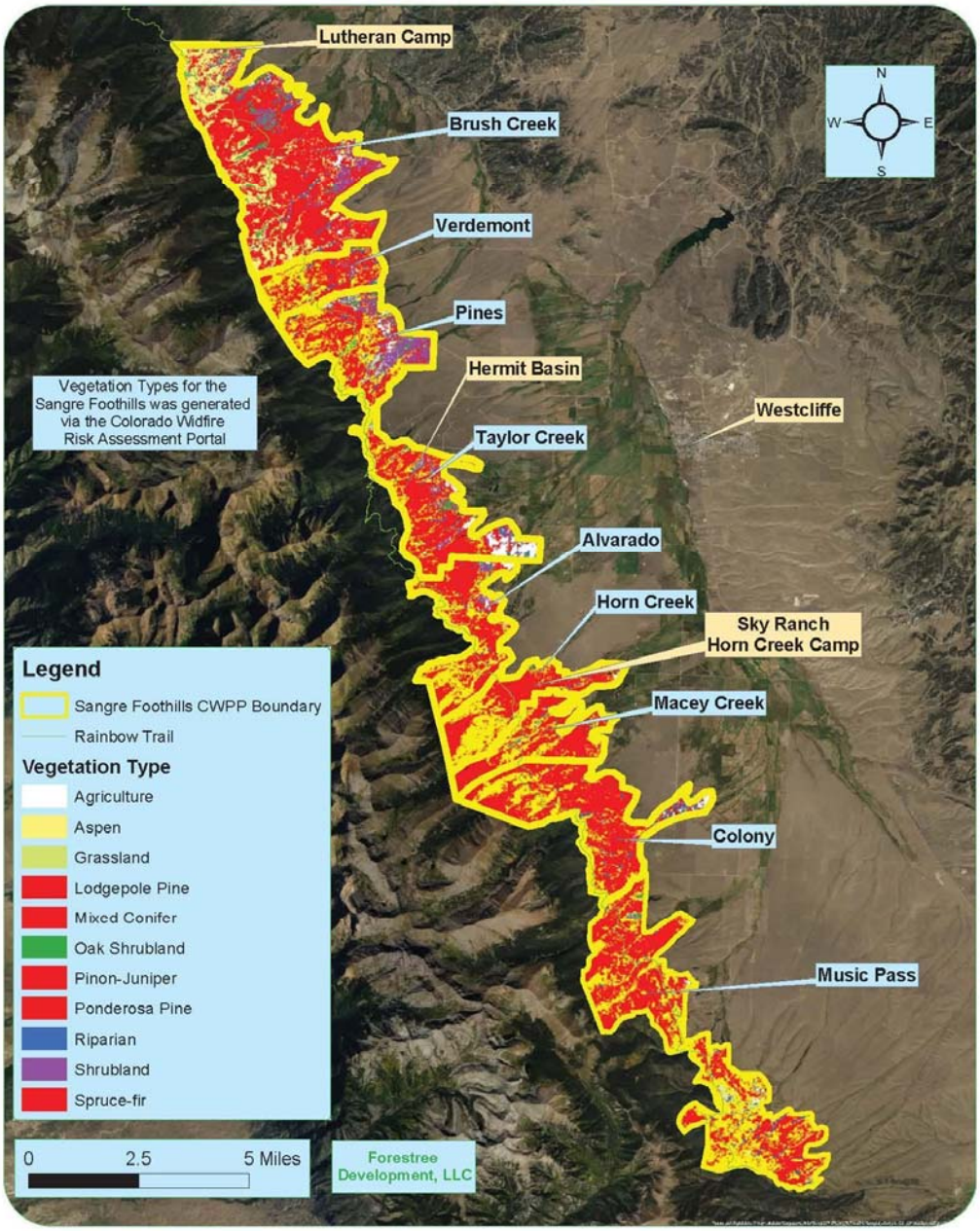
weather and fuel conditions. Most of the homes and structures are lost during this "convergence of conditions" of fuel, weather and topography within the first 24 hours of the fire.

Other observations of the fuels in the CWPP are:

- Large, un-thinned, 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 San Isabel National Forest can threaten civilian evacuation, and firefighter access and safety.
- Aerial resources may be unavailable, or 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.

Community Wildfire Protection Plan

Custer County Sangre Foothills: Vegetation Map



Wildfire Risk and WUI Boundary

Wildfire Risk

Vegetation in the study area is dominated by a second-growth ponderosa pine, mixed-conifer forests with a high percentage of closed crowns, and dense pine, fir and Douglas-fir understory. Fuel models for this timber type is:

- FBO Fuel Models **1**and **9**[4]
- NFDRS Models **U** and **L**[5]

A high percentage of the area is covered by prairie fuels intermixed with low shrub species. Fuel models for these areas are:

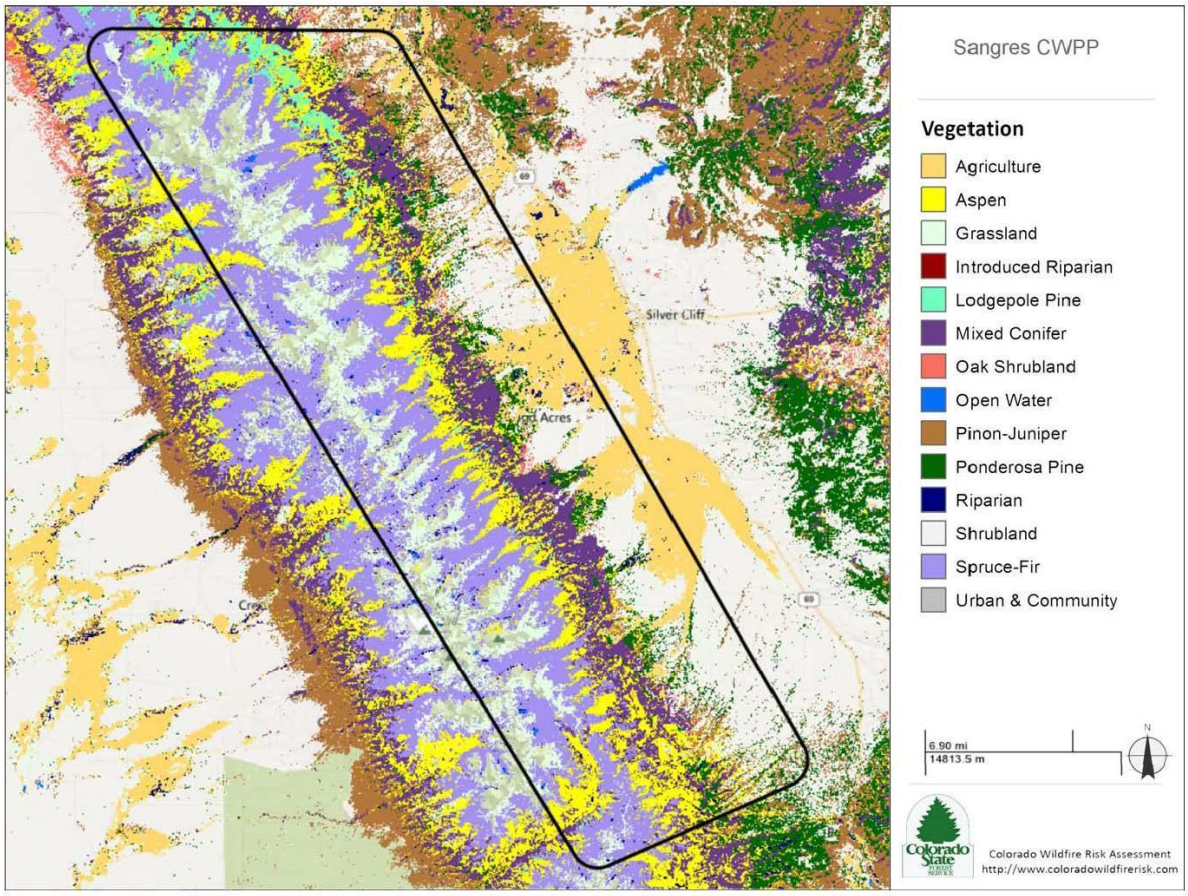
- FBO Fuel Models **1** and **2**
- NFDRS Models **A**, **C**, **L** and **T**

Riparian zones along waterways and seasonal storm channels are made up of shrub species such as willows and cottonwoods, intermixed with grass fuels. These areas are of concern where they abut high density subdivisions; especially under drought conditions. Fuel models for these areas are:

- FBO Model **5**
- NFDRS Models **F** and **T**

[4] *Aids to Determining Fuel Models For Estimating Fire Behavior*, Hal E. Anderson, USDA Forest Service General Technical Report INT-122, April 1982.

[5] *Gaining an Understanding of the National Fire Danger Rating System (NFDRS)*, PMS 932/NFES 2665, National Wildfire Coordinating Group (NWCG), 2002.

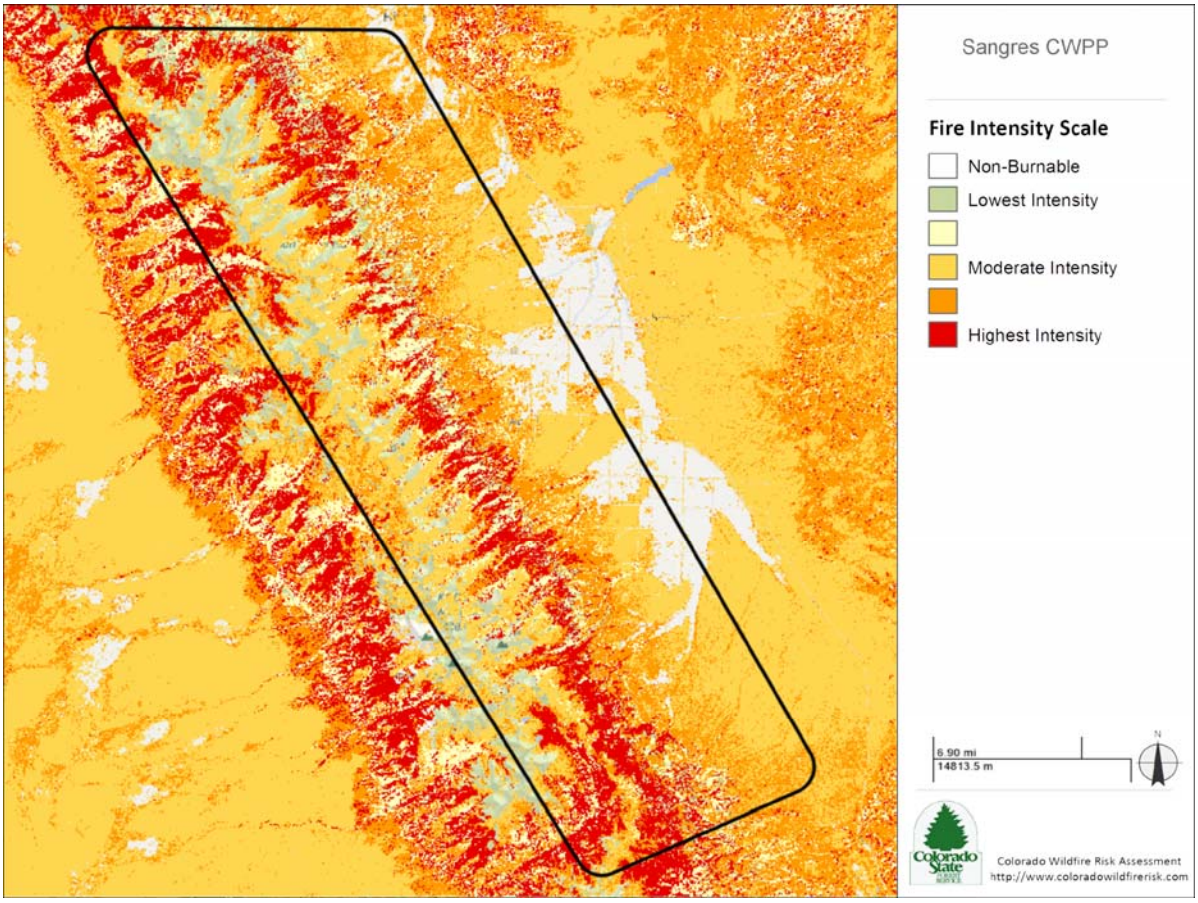


Wildland Urban Interface Fuel Types (CO-WRAP)

The wildfire intensity map represents the Colorado Wildfire Risk Assessment Portal (CO-WRAP) analysis of the potential wildfire intensity in and around the study area. 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.

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 Duckett and Hayden Pass 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.

The existing fuels will have high rates of spread under relatively mild weather conditions.



Rate of Spread and Wildfire Intensity (1 Chain = 66 feet)

Local topography further aggravates fire behavior and control. Prevailing west winds are funneled through the communities involved, with eddying effects on the leeward side of the Sangre de Cristo Range. 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 Hayden Pass Fire, burning conditions were considered extreme, with spread rates over 100 chains per hour or 1.25 miles per hour.

Preparedness to Respond

Wet Mountain Fire Protection District Stations and Apparatus

The Wet Mountain Fire Protection District (WMFPD) consists of six stations and approximately 28 volunteer firefighters.

Main Station – 215 N. 4th Street Located in the Town of Westcliffe, primary response station for all areas			
ID	**WD**	**DESCRIPTION**	**TYPE**
Command-343		Command Vehicle	
Engine-4		Brush Truck	Type 6
Engine-7	6x6	Heavy Brush Tender	Tactical, Type 1
Engine-14	4x4	Pumper	Type 1
Engine-11	4x4	Pumper	Type 2
Engine-15		Brush Truck	Type 6
Rescue-1		Heavy Rescue Pumper	Type 1
Rescue-9		Rescue Truck	
Tender-8	6x2	Tender	Tactical, Type 1
Fire Ranger 1		UTV	
Fire Range 2		UTV	
Trailer 2		750 gal. water tank on trailer	
Trailer 3		14’ Studebaker 22 Rescue Boat with Mercury motor	

Rosita Station – 7113 County Road 328			
NAME	**WD**	**DESCRIPTION**	**TYPE**
Engine-3	4x2	Pumper	Type 3
Engine-12		Brush Truck	Type 6

DeWeese Station – 7113 County Road 241			
NAME	**WD**	**DESCRIPTION**	**TYPE**
Engine-5	4x2	Pumper	Type 3
Engine-12		Brush Truck	Type 6

Hillside Station – 72000 Hwy 69 N			
NAME	**WD**	**DESCRIPTION**	**Type**
Engine-6		Brush Truck	Type 6

Boneyard Station – 2901 County Road 265			
NAME	**WD**	**DESCRIPTION**	**TYPE**
Engine-2	4x2	Pumper	Type 2
Engine-10		Brush	Type 6

Blizzardine Station (at Silver West Airport)			
NAME	**WD**	**DESCRIPTION**	**Type**
Engine-32	4X4	Pumper- Not in service at this time.	Type- not determined at this time.

Staging Areas

The District has identified locations where responding mutual aid or auto aid fire departments may be staged for assignment in the early stages of a wildland event, or until an Incident Command Post or alternate staging area is established. These locations are listed in Appendix A. These should follow NWCG guidelines for firefighter safety zones, and based on all personnel in full Personal Protective Equipment (PPE). Diameters to be adjusted based on surrounding fuel loading.

Water Supplies

Firefighting water supplies are typically available through hydrant systems in the developed portions of the towns of Westcliffe and Silver Cliff that are served by the Round Mountain Water and Sanitation District. Rural areas are dependent on cisterns, agricultural irrigation ponds and lakes. The Fire District has set a goal to map these potential water supplies, and establish agreements with the landowners. It should be noted USFS requires a “Use Agreement” with landowners prior to emergency water use.

Cisterns or hydrants are usually intended for use during structure fires in which, typically, only one house is on fire at any one time. Structural firefighting resources are not required to be mobile. The opposite occurs during a wildland fire in which resources must be mobile, and prepared to move quickly out of harm’s way.

Water supplies are critical for maintaining lower Insurance Services Organization (ISO) ratings that affect homeowner insurance rates. In unincorporated areas of the county there are currently no requirements for providing water supplies. Communities should consider providing for the establishment of available water supplies with approved equipment connections per the Fire District.

Evacuation Centers

Two primary locations were identified as potential evacuation centers, for events in the study area. These are:

- Valley Bible Fellowship – 116 Hermit Lane, Silver Cliff, Colorado 81252
- County Fair Grounds for large animals— 90 CR241 Westcliffe, CO 81252

The High School may serve as an Emergency Shelter, as allowed by an Inter-Governmental Agreement with the County, if the facility is available. Location of evacuation centers and shelters will be determined by Custer County and communicated during emergency events, by the Custer County Emergency Operations Center, (EOC) and the Office of Emergency Management.

Custer County Emergency Plans

The Custer County and Towns of Westcliffe and Silver Cliff Emergency Operations Plan 2017 (EOP), describes the structure and guidelines for managing a major emergency or disaster affecting Custer County and/or the Towns of Westcliffe and Silver Cliff. This plan is part of a larger system of inter-related plans at the local, state and federal levels. They are founded upon the National Response Framework (NRF) and the principles of the National Incident Management Systems (NIMS). The inter-related nature of the plans and incident management system are designed to allow maximum coordination and cooperation between responders from all levels of government. The process, as described by law and regulations, is that the incident is "owned" by the local jurisdiction having authority.

The Custer County Annual Operating Plan, (AOP) is prepared pursuant to the state annual operating plan, *Colorado Statewide Wildland Fire Management Annual Operating Plan* (State AOP). The *Colorado Statewide Wildland Fire Management Annual Operating Plan* was prepared pursuant to the *Colorado Statewide Cooperative Wildland Fire Management and Stafford Act Response Agreement* signed and dated 6/1/2011, and as amended in 2013. The Purpose of this local annual operating plan is applicable to all signatory parties (Custer County, Colorado Division of Fire Prevention and Control, USDA Forest Service Rocky Mountain Region, and USDI Colorado Bureau of Land Management) within the State of Colorado. It addresses how signatories will implement cooperation, interagency working relationships and protocols, financial arrangements, and joint fire management activities within Custer County, Colorado.

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, Custer County cooperates with several mutual aid agencies in the South Region of the state.

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. Custer County adopted NIMS in 2005, by County Resolution, #05-01 (reception #200782 B:518; P:81 March 04, 2005).

Mutual Aid

The Custer County Sheriff's Office and Board of County Commissioners (BoCC) participate in the Annual Wildfire Operating Plan (AOP) for Custer County Colorado. The Plan, updated annually, describes how County agencies coordinate wildfire suppression activities with those of the Colorado Department of Public Safety (DPS), DFPC, the U.S 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 *State of Colorado, Department of Public Safety, Intergovernmental Agreement with the Board of County Commissioners for the County of Custer* requires Custer County to have a signed County AOP to access Emergency Fire Fund (EFF) funds.

An Expanding Hierarchy of Resources

The responsibility for wildfire suppression initially rests with the jurisdiction where the wildfire starts. The Custer County Sheriff is responsible for suppression of wildfires that occur on unincorporated, non-federal land that is outside a fire protection district. Once the Custer County Sheriff's Office has assumed responsibility for the wildfire incident, the CCSO shall assume financial responsibility for firefighting efforts and shall assign a local incident management team to provide the command and control infrastructure required to manage the wildfire (C.R.S 30-10-513).

If the fire exceeds the County's capability to control, the Sheriff can request assistance from the Colorado Department of Public Safety, Division of Fire Prevention and Control (DFPC) under terms of the Emergency Fire Fund (EFF) Agreement. When EFF is implemented, DFPC 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.

Public Notification and Warning

The Sheriff's Office has several methods to notify and warn people who are threatened by an approaching wildfire (all of which are fallible. (See Emergency Evacuation section below.):

- Automated telephone notification (Code Red).
- Local media announcements, including social media.
- **If possible and safe to do so, door-to-door warnings, as resources allow.**

Code Red

Custer County currently utilizes the Code Red Emergency System. Notification calls, and text messages are not automatically routed to cellular phones, requiring residents with cellular phones to register their cell phones online. The same applies to residents that use Voice-over-internet-protocol (VOIP) telephone service. These phone numbers are typically not automatically included in emergency notifications unless the subscriber has registered the phone number ahead of time. Online registration instructions and links for Code Red or any future notification systems, can be located on the Custer County website at:

http://www.custercountygov.com/

Automated calls may be intercepted by calling features, such as automated attendants, call waiting, busy signals and other features which may intercept or reject the call. Adding notification numbers to your telephone's phone book feature will quickly identify general and emergency notification calls, so you can readily distinguish the incoming call as an emergency alert.

The Custer County Consolidated School District, (CCCSD) currently has a currently has a notification system called EZ School Reach, used to communicate with parents. No schools are currently located in high hazard areas. However, students may be at risk if

school bus routes are compromised by wildfire. The school district may be requested to keep students at the school until the emergency has ended. The **EZ School Reach** system can be used to notify parents of the status of their children. School district and the local emergency services agencies should consider partnering to:

- Provide notification to schools with students from impacted areas.
- Train bus drivers on procedures should they encounter a wildfire situation, and awareness of alternate routes to safety, in the absence of direction from law enforcement.
- Pre-determine locations for return of students, whether to the point of origin or evacuation center.
- Utilize existing communication tools for distribution of emergency preparedness information to parents.

Evacuation and Sheltering

An Incident Commander may recommend evacuation of specific neighborhoods, or closure of certain roads; the authority and responsibility of evacuation lies with the County Sheriff.

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

Conference Centers, including religious facilities and other properties with Special Use Permits and Special Event Permits in the county should develop and maintain comprehensive Evacuation Plans; and request a property evaluation by the District to identify threats and to assist with mitigation planning. Evacuation planning assistance may be requested and coordinated through the CCOEM. Evacuation plans should be distributed to the emergency response organizations, through the CCOEM annually.

The Rainbow Trail Lutheran Camp was evacuated during the South Lake, Duckett and Hayden Pass Fires. They maintain a detailed plan that can serve as a model for others to follow. A key to the success of any advance planning, is training staff, exercising by performing drills and implementing corrective action(s) to the plan.

Emergency Evacuation

NOTICE TO EVACUATE. In case of a fire or other emergency, the primary notification to evacuate will be issued by the Custer County Sheriff by means of a reverse emergency notification system. Residents should follow the directions provided. Other notifications may come from local TV and Radio stations and Social Media.

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. Residents and visitors to the area should have pre-planed evacuation routes.

- Residents should heed evacuation instructions without delay!

- Evacuations Orders may be delayed or undeliverable due to communications failures when critical infrastructure is damaged by fire. Never rely on an automated notification to evacuate.
- If a wildfire is threatening the area, it is not necessary to wait for an evacuation order to leave.
- Facilities with large guest populations should plan on multiple means of transportation for evacuations, as CCCSD may not have buses available at all times.

It is vitally important that residents and guest populations are prepared to evacuate long before a fire or other disaster occurs. 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:

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

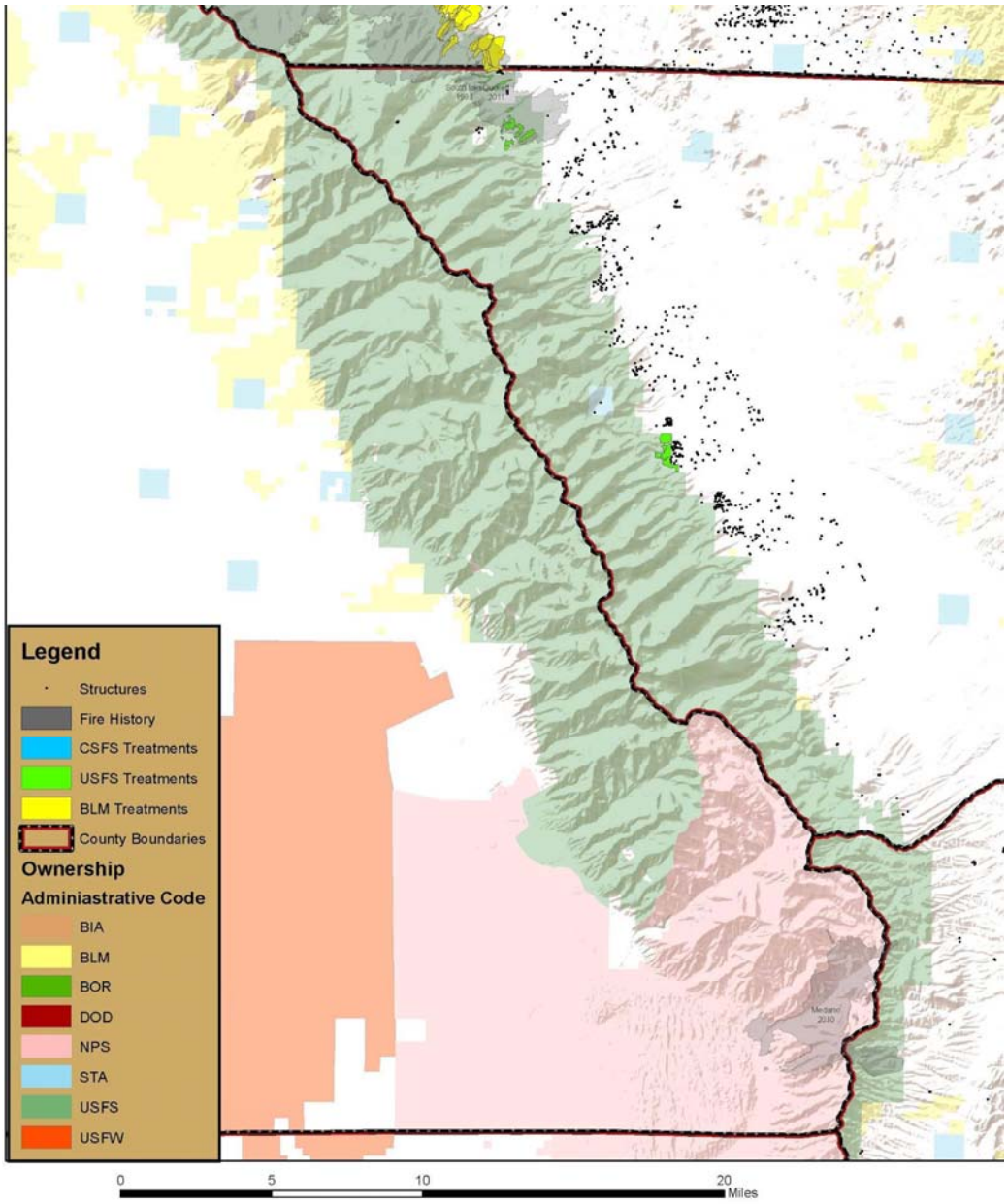
Risk of Ignition and Wildfire Occurrence

Causes of Wildfire Ignitions

Reconstruction of fire history and forest dynamics in the Sangres Foothills area, reveals:

1. An average fire interval of about fifty years during the period 1300-1880, but no major fires between 1880 and 2002;
2. A mix of surface fire and stand replacing fire in the historic burns (mixed severity fire regime); and
3. A striking increase in forest density from 1900-2002. See the fire history map below.

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 Hayden Pass and Duckett Fires a decade later.



Fire History Map, Sangres Foothills (excerpt from USDA Forest Service Map, 1-20-17)

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 also 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, Colorado 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 at greatest risk.

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. The same roadways that may be critical for evacuation can also be ignition points for wildfire starts. These roadways create exposures from auto accidents, disabled vehicles, cigarettes, and right-of-way maintenance activities. Residential exposures to fire can be from maintenance equipment, barbeque grills, unsupervised youth, and burning structures. Outdoor burning, improper ash disposal, chimney fires/embers from chimney's, as well as sparks from recreational equipment and chains saws are other common sources of wildfire starts.

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. All residences in the District should be considered as being in the Wildland/Urban Interface (WUI). The homes in CWPP Study Area 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 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 the community are particularly vulnerable to firebrands.

Home Construction and Vulnerability to Wildfire:

The communities are 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 the CWPP. 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, combustible items such as dead vegetation and debris 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 the CWPP Study Area. 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. 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.[6] 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.

New home construction projects should utilize best practices for home site location and incorporate fire resistant construction methodologies from the conceptual design phase; regardless of the inexistence of codes or WUI ordinances requiring such actions.

[6] 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 (Source: Firewise USA)

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 combustibility of the structures to protect them from wind borne embers (firebrands), radiation and convective heat.

Information is available at the Colorado State Forest Service website:

www.csfs.colostate.edu

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.

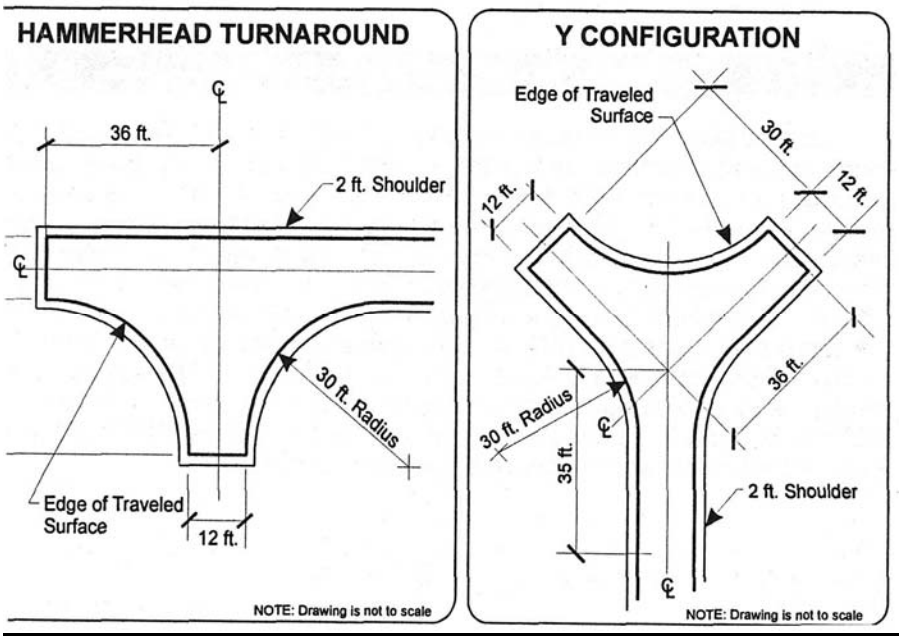
Zone One: This is the closest zone to a structure and extends 30 feet from the outermost edge of a structure including any decks. The management goal is to reduce or eliminate most large trees or shrubs within this zone so that the convective heat will not ignite the structure. A few tall trees may be 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-feet 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. Recommended dimensions are shown in the detail below.



Fire Engine Turn-around Requirements

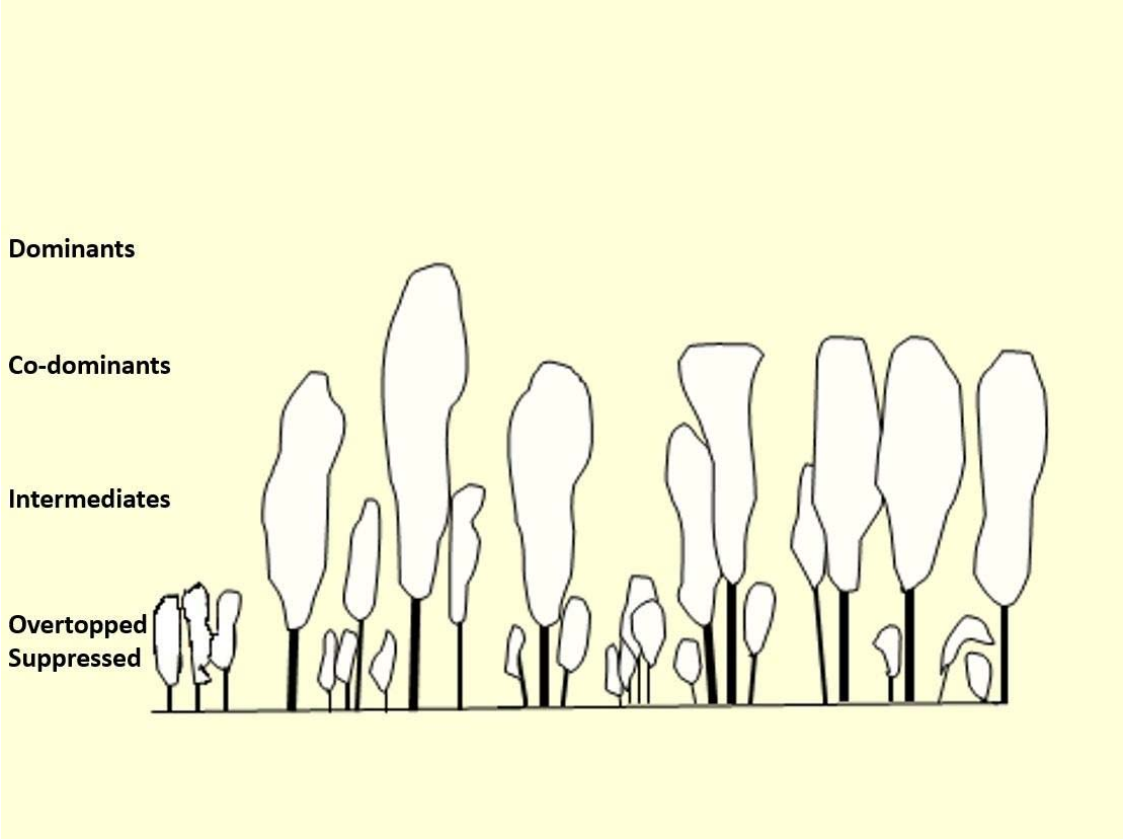
Zone three: The guideline for zone three is to thin the forest primarily to improve forest health. Spacing is less critical in this area but spaces should be made in the canopy. A useful rule of thumb is that, generally, a tree's branches should not touch or intermingle with branches of adjacent trees.

Thinning in zone three is often considered an afterthought compared to zones one and two. Thinning in zone three is usually recommended as a form of forest stewardship rather than fire mitigation. Management and thinning in this area is critical to fire mitigation on a community wide basis since it connects the defensible spaces into an integrated whole.

Thinning and Fuel Reduction

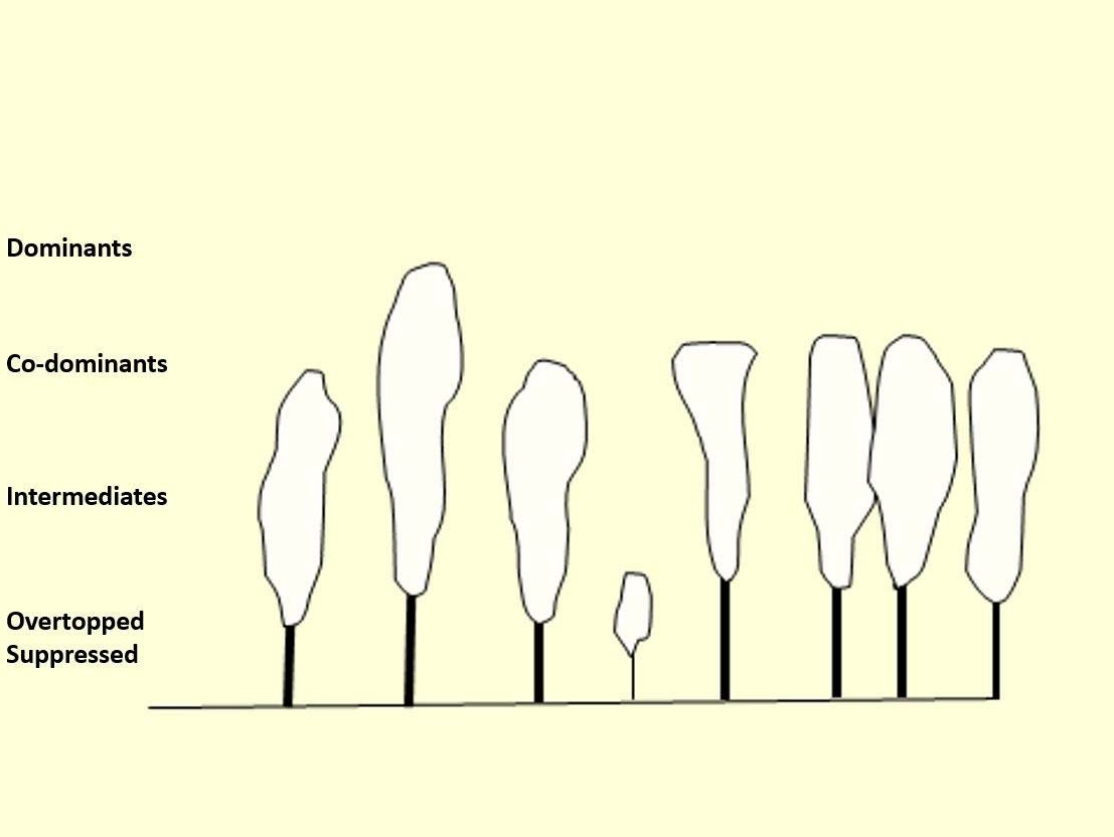
Foresters use many methods of thinning depending on the specific objectives of the landowner. Fuel break thinning is most often accomplished by a process called thinning from below. Trees are usually removed or remain based on their height in the canopy.

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.



Crown Fire Prone Stand Structure

Thinning from below removes all 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.



Stand Structure for Reduced Crown Fire Potential

Maintenance

Defensible 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.

Prairie Fuels

Prairie fires have the potential to be both deadly and destructive. These fuels should be considered as moderate hazard due to their ability to spread rapidly under windy conditions. Ignition potential is high. Containment is often difficult due to spotting; especially if embers are generated by burning structures in the fire's path. Flame lengths of 9 to 15 feet can be expected. Burning yucca, native shrubs, animal dung, and noxious weeds can also contribute to spotting.

The primary technique for managing prairie fuels is by regular mowing to a maximum height of six inches. Typically, no more than two mowings per year should be necessary for lower density residential areas beyond thirty feet from structures. Areas within thirty feet of structures, including fences, should be mowed on a more regular basis, and cut to a four-inch height. Widths of mowed buffers should be widened to allow for steep slopes, dry aspects, and prevailing winds. Grazing can also be used as a fuel management tool.

Outbuildings and vehicle storage areas should also be well maintained to prevent losses during fast moving prairie fires.

Prairie Fuels shown with high level of maintenance around structures.

Riparian Zones

Flood plain areas, riparian zones, can have high wildfire potential during the fall and winter. Extended droughts can also allow normally wet areas to burn with high intensity. Ember potential can also be high under windy conditions.

Riparian Zone with cattail fuels abutting homes.

Riparian areas should be managed carefully. Any thinning of shrubs or trees should be done by hand and use of heavy equipment should be avoided. Riparian areas may be regulated by the Army Corp of Engineers or Environmental Protection Agency under the Clean Water Act. Before any work is done in riparian areas, a site-specific consultation with a qualified professional is recommended. These areas should be monitored for wildfire risk on a regular basis. Fire starts can move quickly to fences, and then to structures.

Open Spaces

Open areas controlled by homeowner associations should be mowed annually where adjacent to fences and structures. If the association does not manage these fuels, abutting owners should be allowed to keep it maintained. Typically, no more than two mowings per year should be required for hazard reduction. Grasses and weeds along fence lines should not exceed six inches in height.

IMPLEMENTATION AND MONITORING

Implementation

A table in Appendix A lists mitigation projects identified, their priority rankings and the lead agency for the projects. In addition to the projects in Appendix A, home sites are rated as high or extreme wildfire hazard and are in critical need of defensible space improvement.

All roads are considered as primary evacuation routes from zones of high fuel volumes (timber), and typically lead to zones of lower fuel volumes (prairies).

The following are suggested fuel treatments:

- Shaded Fuel Breaks (SFB): Major collector roads are critical for emergency evacuation. These should follow CSFS guidelines where possible.[7] Connection of homeowner HIZ's to SFB areas is recommended.
- Forest Management and HIZ overlap 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.

Key Intersections

Road 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 staging by law enforcement personnel who may be directing traffic.

[7] Fuel Break Guidelines for Forested Subdivisions and Communities. Frank C. Dennis, Colorado State Forest Service.

Fire and smoke impinging on right-of-way during the Black Forest Fire.

Monitoring

Monitoring is an important part of follow-up to the implementation of projects. Healthy Forest Restoration Act (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 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 of the Sangres Foothills Community Wildfire Protection Plan calls for an annual field review by the partners (participants) of accomplishments and need for maintenance. Based on this review, needed adjustments in the next year's plan should be made, as appropriate.

Residential Community Action Plan

During the CWPP process, the following actions were suggested:

- Provide operational authority to WMFPD for use of the emergency water supplies. This can be in the form of an agreement authorized by the owner or homeowner association board of directors.
- Develop a community evacuation map for distribution to all residents.
- Install evacuation route signs at critical exits from neighborhoods. (See sign example below.)

- Develop a template for installation and maintenance of community street signs, and mail kiosks to prevent damage by wildfire. All private road signage should be reflective and visible from all directions of travel.[8]
- Provide reflective address markers at entry points of shared driveways, to assist firefighters and deputies with door-to-door evacuation notifications.
- Private road and shared driveways should use metal culverts. Corrugated plastic or PVC culverts are combustible and can burn underneath an egress route. This could lead to civilian or firefighter entrapment. NOTE: An exception to this can be considered if fire rated material is used. A minimum of "B" fire rating is recommended.
- Coordinate with Custer County and/or adjacent landowners, including USFS/BLM, on identification and implementation of joint fuel treatment projects along boundaries, open spaces and roads.
- Coordinate with Custer County Road and Bridge Department to allow for the thinning of trees and/or remove of ladder fuels within and adjacent to rights-of-way, to reduce fire starts along roads and enhance the fire containment qualities of the roadway.
- Implement at least two demonstration fuel treatments or forestry projects on private lots.
- For subdivisions with private roads, 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 for post-fire mitigation.
- Implement an educational program, in cooperation with Sangre de Cristo Electric Association and Century Link for all above ground utilities. Vegetation and fencing placed around utilities should be avoided to prevent damage by wildfire. The same should apply to propane tanks.[9]
- Establish community (HOA) guidelines for Firewise construction, Firewise landscaping, and forestry practices, including disposal of woody debris within the community
- Obtain Firewise Communities/USA recognition status.
- Complete a community wildfire assessment meeting the criteria for recognition as a Firewise USA community. NOTE: Completion of the assessment will allow addition of the community to this CWPP by administrative approval of CCOEM, WMFPD and CSFS.

[8] It is recommended to follow Manual of Uniform Traffic Control Devices (MUTCD) requirements for all street signs.

[9] Propane tanks are susceptible to "boiling liquid expanding vapor explosion" (BLEVE). Older tanks may not be equipped with proper venting devices and more prone to BLEVE that may pose a risk to firefighters. Property owners should contact their propane provider to insure updated tank protections are in place.

Evacuation sign shown at locked gate. Small box above the sign is a “Knox” controlled device accessible by the fire jurisdiction. The sign is MUTCD compliant.

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 mailbox 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:
  - Landscape entrance areas with Firewise plants to illustrate Firewise landscaping principles.
  - 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.
    - Each neighborhood or community should consider becoming a recognized Firewise Community.

Annual

- Renew Firewise Community status
    - Firewise Day, meeting or special event.
- Coordinate cross-training between all committees (Forestry, Architectural Control, and Fire Mitigation, etc.)
- 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 operating plans to determine annual project needs:
    - Apply for grant funding as available.
- Contact all partners to update any wildfire mitigation needs related to critical infrastructure.
    - Sangre de Cristo Electric- Power line clearance needs along all utility easements.
    - Utility Pole Inspection and Replacement.
    - 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 abutting ownerships to coordinate fuel treatment projects.
- Continue community wide educational programs through classes, meetings and annual events. Topics may include:
    - Evacuation Planning.
    - Custer County Alert and Notification System 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 D-Space Zone 2: 10 feet between crowns (20 feet between crowns of tree clumps).
    - Forest Health Thinning D-Space 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. Consider removing most encroaching trees from meadows to maintain biological diversity.
    - Prune as necessary to reduce torching potential.

Recommendations

This section provides recommendations for the many stakeholders who can have an impact on wildfire and public safety.

Custer County

Custer County is the governmental entity covering unincorporated areas of the Sangre Foothills region. The following are recommended:

- County Road rights–of-ways (ROW) should be cleared and kept free of invading conifer species. Conifers, ponderosa pines, contributed significantly to fire spread and heat transfer across roadways during the Black Forest and Beulah Fires. Evacuation of civilians and firefighter safety were compromised. Ditch maintenance and mowing practices are also impeded. The one exception to total tree removal is if trees are adequately spaced as part of a “shaded fuel break”[10] extending 150 feet from the ROW edge. This is a public safety issue that should be addressed as it relates to the county’s charge of protection of life, safety and welfare of its citizens.

- Plastic corrugated culverts are not currently allowed in public ROW due to their susceptibility to total consumption during wildfires. Several instances of firefighter safety

[10] See document “*Fuel Break Guidelines for Forested Subdivisions and Communities*”, Colorado State Forest Service, F. C. Dennis

being compromised during the wildfire have been reported. In one instance, a fire truck was stuck after a burnt-out culvert collapsed and nearly resulted in burn-over of the engine and crew. Custer County should continue the practice of dis-allowing these materials.

- There are currently no Custer County open spaces and parks in the study area. However, if in the future, Custer County acquires property that abuts residential areas, these should be prioritized for fuel treatments that promote fire adapted ecosystems. Fuel treatment zones should be a minimum of 300 feet wide, adjusted for slope and fuel type.

- Custer County should not allow creation of any private open spaces or lots within any future subdivisions in which the ecosystem or forest has not been restored to a fire adapted condition. Refer to the Black Forest Fire Assessment, and its sections: "Cathedral Pines Assessment" and "State School Land Section 16 Assessment"[11] are good examples to follow.

- Eventually, Custer County may have to consider implementation of building and development regulations governing construction in WUI areas of the county. Many property insurers now require owners to mitigate their wildland fuel hazards. This will be a significant economic issue if property owners can no longer obtain affordable insurance coverage. Both new and existing properties will be impacted, along with re-sale of properties. The WUI can be rightfully compared to heavily regulated flood and geologic hazard zones regarding threats to life, property and natural resources. This is further compounded by the public costs for protecting WUI dwellers, and post-fire recovery expenditures that can linger on for years. The fiscally conservative approach should be to impose these costs on their beneficiaries (developers, builders and WUI dwellers).

- Education is a powerful tool for changing behavior. Custer County currently has a wildfire awareness program in place. It is imperative for the county to continue to reach out to existing organizations as an active partner for wildfire mitigation and education.

- Complete vegetation mitigation and structural hardening at the Custer County Verdemont Radio Tower site.

- **Provide all County law enforcement and Road and Bridge personnel with Personal Protective Equipment (PPE), and entrapment avoidance training.**

- **Perform door-to-door evacuations, only if safe to do so, while maintaining life/safety of all first responders as the first priority.**

- **Consider providing NWCG wildland fire training and/or certifications for county personnel and equipment (required for use on state or federal fires).**

[11] Black Forest Fire Assessment Report. Pikes Peak Wildfire Prevention Partners, 2014, www.ppwpp.org

Fire Jurisdictions

Multiple challenges exist. Recommendations are:

- Continue to work toward better communication coordination. The Firefighter Survey[12] noted poor radio communications during the Black Forest Fire that placed firefighters at risk. Communications were hampered by irregular terrain that creates "shadowed" areas with little or no coverage. Communications failures are a recurrent theme among agencies during After Action Reviews, (AARs), including the most recent Junkins Fire.

- The Custer County Planning Commission, under the direction of the Custer County Planning & Zoning Office and the BoCC, should begin study of jurisdictions with regulations that allow for all new construction and new developments to be fire adapted. These entities have the statutory responsibility and/or local authority to recommend the implementation of appropriate codes and ordinances that will reduce risks to the public and to first responders.[13] This will require partnering with non-governmental organizations (NGOs), such as builders, developers, foresters, mitigation experts and insurance industry representatives.

- Educate elected officials and the public on the continued need for improved water supplies. At the same time, it is critical to stress that cistern water supplies are for structure protection when one structure is on fire at one time, or for containment of smaller wildfires with normal weather conditions. Extreme wildfire behavior threatens hundreds of structures at one time.

- Educate elected officials and the public on the use and limitations of aerial firefighting resources as an effective tool **if** property owners have managed their fuels. The public must understand that aerial resources are a valuable tool, but are not a substitute for inaction by property owners.

- Continue efforts to educate WUI residents on their responsibility to manage their fuels so firefighters can work safely and effectively to protect their lives, properties and forests.

- The Fire District has set a goal to map potential water supplies and establish agreements with the landowners. It should be noted USFS requires a "Use Agreement" with landowners prior to emergency water use.
- Continue and expand the number of home and community assessments.

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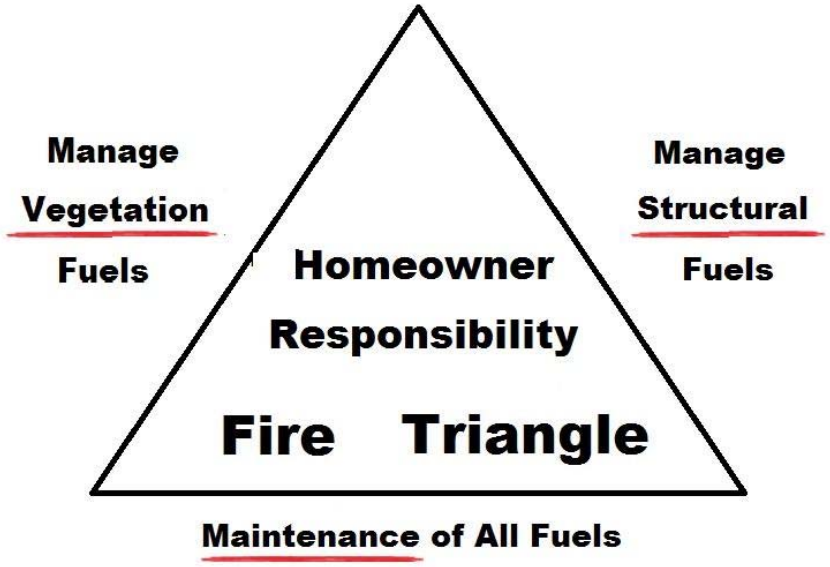
[12] Black Forest Fire Assessment Report. Pikes Peak Wildfire Prevention Partners, 2014, www.ppwpp.org

[13] **WHEREAS**, pursuant to C.R.S. §§ 30-11-101(2)(a) and 30-15-401, *et seq*., the Board of County Commissioners of the County of Custer, State of Colorado (hereinafter "Board" or "BOCC"), has the power to adopt ordinances, resolutions, rules and other regulations as may be necessary for the control of those matters of purely local concern, and to do all acts which may be necessary or expedient to promote the health, safety, and welfare of the citizens of Custer County; and……

Resident Responsibilities

Multiple large fires have occurred in this area, resulting in the loss of homes. Additional fires are certain to occur in the future. Residents and property owners should be put on notice that:

- Wildfire mitigation is the responsibility of the property owner who is the sole owner of his/her fuels. An Australian saying bluntly states, “You own the fuel, you own the fire.” A model for homeowner responsibility is shown below.
- Secondary responsibility falls on neighbors who must work together to manage their collective wildfire risks. Property owners who do not mitigate their fuels place their neighbor’s lives, homes and forests at risk.
- Thinning trees to provide good spacing between individual or groups of trees, and pruning dead and lower branches, reduces wildfire risk as well as improve forest health, vigor, growth and aesthetic value.
- Structural hardening against ember ignitions and flames must be done on all structures constructed in wildfire prone environments. This will be critical to maintain access to affordable homeowner insurance.
- Property owners must recognize their responsibility to firefighters by providing a safe working space. Firefighters will attempt to protect all homes, if given a chance. Owners should also be aware that failure to mitigate their structures and native fuels takes away valuable time from those who mitigated their fuels.
- Structure protection by firefighters during an incident is not guaranteed.
- Property owners must learn that traditional firefighting resources are based on one house on fire at one time. Wildfires, especially with extreme burning conditions, place hundreds of homes at risk at one time. Property tax assessments are predicated on the traditional model- not the wildfire model.



A proposed new Homeowner Fire Triangle[14] in which property owners take personal responsibility for their private property

Critical Lessons Learned

No amount of fire engines, firefighters, bulldozers, slurry bombers or helicopters could have stopped the Junkins Fire. Unmitigated forest fuels, combined with up sloping terrain and high winds immediately overwhelmed any attempts at containment. Fortunately, no residents lost their lives in the ensuing firestorm.

Critical lessons learned were:

- Defensible spaces are critical for insuring firefighter safety and effectiveness.
- Defensible spaces can be overwhelmed by wildfire from adjoining properties.
- Where forest fuels have been treated, tree losses and resource damage are significantly reduced.
- Fire is an ecological process. Fire adapted communities are more resilient and result in reduced risks.

[14] Based on wildland firefighter "Fire Triangles". Fire Triangle is fuel, heat and oxygen. Fire Behavior Triangle is fuel, weather and topography. The common element is fuel- the only shared and controllable element.

- Structural hardening to prevent ember ignitions is just as important (if not more important) as treatment of surrounding native fuels.
- Unregulated construction in areas prone to extreme wildfire behavior will continue to result in similar disasters.

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.

The Sangres Foothills is a special area and provides a unique living environment with its mix of forests and prairies. Wildfires are inevitable and a part of the Ponderosa Pine, mixed-conifer and prairie ecosystems. 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.