

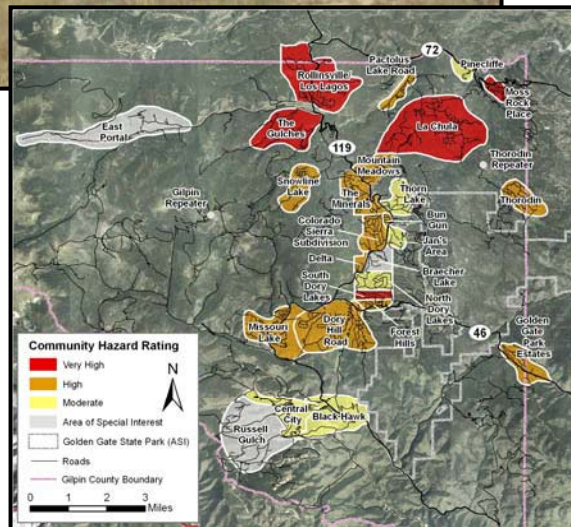
# GILPIN COUNTY, COLORADO

## Community Wildfire Protection Plan



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Gilpin County, Colorado

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# INTRODUCTION

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## PURPOSE

The Community Wildfire Protection Plan (CWPP) is a collaboratively developed strategic plan. The plan identifies specific wildland fire hazards and risks facing wildland urban-interface (WUI) communities and neighborhoods. It provides prioritized mitigation recommendations that are designed to reduce those hazards and risks. The CWPP development process allows the community to plan how it will reduce wildfire hazards and risks by identifying strategic areas and methods for fuel reduction across the landscape. A certified CWPP creates a National Fire Plan funding priority to support the financing of projects identified in the assessment. Further, federal land management agencies may be able to expedite the implementation of fuel treatments identified in the CWPP, through alternative environmental compliance options offered under the Healthy Forest Restoration Act (HFRA).

Once the CWPP is adopted, it is each community's responsibility to move forward and implement the action items identified in the plan. This may require further planning at the project level, cooperation with public land management agencies, acquisition of funding, or simply motivating individual homeowners.

## NEED FOR ACTION

Decades of aggressive fire suppression practices have removed a critical natural cleansing process from the vegetation regeneration cycle. This practice of fire exclusion has altered historic forest and shrub-land conditions, contributing to an unprecedented buildup of naturally occurring flammable woody fuels. Compounding this issue are years of persistent regional drought, resulting in stressed and weakened trees and widespread epidemics of disease, insect infestation, and tree mortality. This convergence of events has led to unprecedented levels of wildfire hazard that is played out every year with increasing wildfire intensity, fire size, extended burn season, suppression costs, and increased structure loss.

At the same time, our nation's demographic profile is shifting to growth centers in western and southwestern states, the same regions where these fire-dependent ecosystems are stressed. The potential for catastrophic consequences to life-safety are devastating, costly, very real, and in recent years has drawn the attention of the U.S. Congress in the pursuit of an effective solution.

## FEDERAL DIRECTIVES

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

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

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

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

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

Further, HFRA helps implement the core components of the NFP and provides the impetus for wildfire risk assessment and planning at the county and community level. HFRA refers to this level of planning as the Community Wildfire Protection Plan (CWPP) process. This process empowers the participating community to take advantage of hazardous fuel management opportunities offered under HFRA legislation. The CWPP includes a framework for hazard evaluation, strategic planning, prioritized access to federal grants supporting hazard reduction projects, and a basis for collaboration with local, state, and federal land management agencies.

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

**This CWPP meets the requirements of HFRA by providing:**

1. *Collaboration* between local and state government representatives, in consultation with federal agencies, stakeholders, and other interested parties
  - See **Pages 11-15** for complete documentation of the collaborative process as well as **Appendix D** for the Community Survey Results.
2. *Prioritized fuel reduction* in identified areas, as well as recommendations for the type and methods of treatment. This includes identifying and prioritizing fuels reduction opportunities across the landscape.
  - See Fuels Modification Projects included by community in **Appendix B**

3. Recommendations and treatment measures to *reduce structural ignitability*. These recommendations will assist homeowners and communities in the reduction of ignitability factors posing a risk to structures in the study area.

- See **pages 26-33** for defensible space and fuels reduction standards and **Appendix B** for community specific recommendations.

## **GOALS AND OBJECTIVES**

Historically, wildfire is a naturally occurring process within Gilpin County. While the risk of wildfire ignition cannot be eliminated, definitive measures can be taken to impact the hazards that contribute to wildfire related losses. The primary goals of this analysis are:

- Conduct a comprehensive, scientifically-based, assessment that identifies critical wildfire hazards and risks within Gilpin County;
- Develop mitigation strategies designed to effectively reduce those hazards; and
- Prioritize fuels reduction projects outlining an achievable project implementation strategy.

Supporting objectives include:

- Facilitating community education concerning wildfire potential, mitigation effectiveness, and community ownership of the CWPP recommendations and action plans;
- Engage federal, state, local agencies, homeowner associations, and private residents;
- Segment the study area into individual Wildland-Urban Interface communities that share similar values at risk and that represent common hazard factors;
- Conduct a standardized community survey for each identified community that quantifies values and hazards affecting each;
- Establish an approximate level of risk for each community based on survey results;
- Conduct a scientifically valid, fire behavior analysis of the entire assessment area;
- Identify and prioritize specific wildfire mitigation treatments at the community level;
- Ensure that local efforts collaborate and coordinate with federal, state, and other related regional efforts; and
- Promote an improved level of emergency response.

# **GILPIN COUNTY PROFILE**

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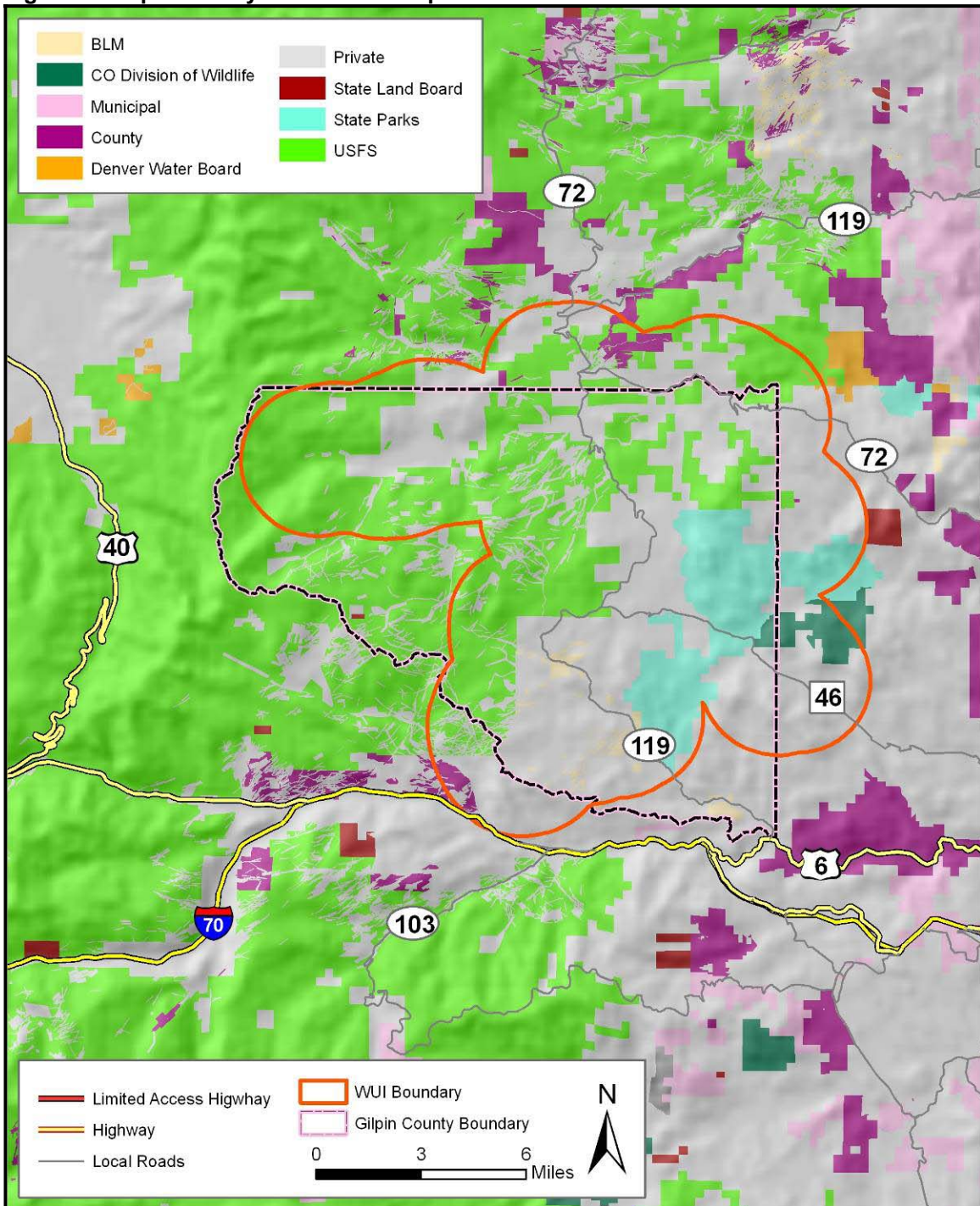
## **COUNTY OVERVIEW**

Originating from what was old Arapahoe County, Kansas Territory; Gilpin County was established in 1861 as one of Colorado's original seventeen counties. The county was named in honor of William Gilpin, the first governor of the Territory of Colorado. Central City, known during the gold rush era as Colorado's most important town, was the designated county seat.

As of 2007 the US census bureau estimates the County's permanent population to be 5,091 residents. This reflects a 6.7% increase from the 2000 census results. The temporary, ambient, or daily tourist population may fluctuate to over 50,000 visitors with casino gambling in Black Hawk and Central City, as well as a healthy flow of outdoor recreational enthusiasts. The elevation ranges from 6,960 feet to 13,294 feet. Below tree line most of the land is forested with about 52% managed by state or forest service agencies. Most of the towns and subdivisions are in the elevation range of 8,000 feet to 9,000 feet.

Please see land ownership map on the next page. All significant maps are replicated in larger format in Appendix C. Please reference these maps for more detail when needed.

**Figure 1. Gilpin County Land Ownership**





## **HISTORICAL DEVELOPMENT**

Early population centers grew rapidly around the first gold discovery in Gregory Gulch in the spring of 1859. By the mid 1860's miners had exhausted the sources of free gold in the shallow veins and current milling practices could not recover gold from the deeper sulfide ores. In 1868 Colorado's first successful ore smelter was built in Black Hawk and the mining industry was revived. Soon other smelters were built along North Clear Creek, the Colorado Central Railroad extended its line into the area by 1872, and the area boomed for several decades, earning the moniker "the richest square mile on earth."

By 1900 Central City's population had grown to over 3,000. Eventually the gold veins became exhausted and by 1920, significant mining activity in the area was over. By 1950, the population of the Black Hawk – Central City area was less than a few hundred.

In 1990 a statewide referendum allowed casino gambling in both towns and a new boom era began. Today, new casino construction continues as both towns compete to attract potential gambling revenue.

**Figure 2. Central City, circa 1880**



## CLIMATE

Average climate data from Black Hawk, elevation 8,000 reflects a relatively mild but dry climate. July and August are the warmest and wettest months, while January and February are the coldest and driest months. Lower elevations within the study area typically experience warmer and drier conditions.

**Table 1. Gilpin County Climate by Month**

Climate Attribute	Month												Annual
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Average maximum temperature (F)	33	37	43	50	60	71	75	73	66	56	48	42	58
Average total precipitation (inches)	0.49	0.58	1.15	1.55	1.70	1.54	2.43	2.45	1.31	1.11	.89	0.67	15.87

Source [www.weather.com](http://www.weather.com)

## TOPOGRAPHY

Topographic characteristics of an area include slope, aspect, and elevation. These factors play an important role in dictating vegetation types and wildland fire behavior. Topography often influences the characteristics of community infrastructure, further effecting wildfire hazard factors. With the continental divide as a western boundary, Gilpin County's topography is characterized by glacially carved valleys to the west and steep eroded canyons and high rolling saddles in the central and eastern portions. The North Fork of Clear Creek and South Boulder Creek form the major drainages that dissect the county. The older historic communities within the county are generally located along broader valley floors, which provided easier access to transportation, water, and other resources. Over the years, newer subdivisions have been constructed in less convenient, harder to reach locations, with minimal water resources and complicated access for residents and emergency responders.

## VEGETATION

Gilpin County is home to three unique ecosystems: the montane, the subalpine, and the alpine. Each ecosystem is a natural unit consisting of all plants, animals and micro-organisms in an area functioning together with all the non-living physical factors of the environment. Ecosystem boundaries are typically characterized by gradual species transitions rather than clear-cut points. However each ecosystem has some unique plants and animals that are typically found within its limits. Variations between the natural units that comprise the three aforementioned ecosystems are dictated largely by elevation, but can also be influenced by slope, slope aspect, drainage, available moisture, amount and type of soil, occurrence of fire or other major disturbances, and other factors.

Existing vegetation is the fuel source for wildland fire and has a direct effect on fire behavior. Understanding what types of vegetation are associated with specific ecosystems is an important step in predicting expected fire behavior. Accurately mapping vegetative ground cover within these zones is a critical component of fuel modeling and fire behavior modeling. Further, understanding the fire behavior

characteristics of particular fuel models facilitates more effective forest treatment strategies on a local, as well as landscape, level.

The montane ecosystem occurs at elevations between approximately 5,600 and 9,500 feet. Dry, south-facing slopes of the montane often have open stands of large ponderosa pines. Spacing of ponderosa pines is somewhat related to available soil moisture. Grasses and shrubs may grow between the widely spaced trees on dry slopes. North aspects of the montane ecosystem retain more soil moisture and support denser stands of conifer that are less drought resistant. The tree species found in the montane ecosystem may include Douglas fir, lodgepole pine, ponderosa pine, limber pine, and an occasional Engelmann spruce. Shade-tolerant plants may grow on the forest floor.

Montane soils with high moisture content may support groves of quaking aspen, whose leaves turn golden-yellow in the autumn and whitish bark are easy to recognize. Along streams or the shores of lakes, other water-loving small trees may be found. These include various willows, mountain alder, and water birch with dark-colored bark. In a few places, blue spruce may grow near streams and sometimes hybridize with Engelmann spruce. Flat montane valleys may frequently have water-logged soil and be unable to support growth of evergreen forests.

Trees common to Gilpin County's montane ecosystem include ponderosa pine, Douglas fir, lodgepole pine, and quaking aspen. Common shrubs include antelope bitterbrush, kinnikinnick, common juniper, Oregon grape, wax currant, big sage, and Rocky Mountain juniper.

The subalpine ecosystem occupies elevations approximately between 9,000 and 11,000 feet. A typical subalpine forest may consist mostly of subalpine fir and Engelmann spruce. However, previously-burned or disrupted areas may contain varying amounts, or even pure stands, of lodgepole pine. Lodgepole seedlings do well in sunlight and are often abundant after a stand replacement event such as fire or de-forestation. However once the forest is re-established, plant succession may result in increasing amounts of spruce and subalpine fir.

Ground cover in a previously-burned forest area often includes two species of huckleberry. Limber pine may also be a part of subalpine forests. Engelmann spruce and subalpine fir, which grow straight and tall in the lower subalpine forests, become shorter and deformed nearer tree line. At tree line, tree seedlings may germinate on the lee side of rocks and grow only as high as the rock provides wind protection. Further growth is more horizontal than vertical; and additional rooting may occur where branches contact the soil. The resulting low growth of dense trees is called krummholz. Well-established krummholz trees may be several hundred to a thousand years old.

Trees common to Gilpin County's subalpine ecosystem include subalpine fir, Engelmann spruce, limber pine. Shrubs common the subalpine zone include blueberry, cinquefoil, wax currant, elder, and Wood's rose.

The alpine ecosystem, starting at elevations of 11,000 to 11,500 feet, completes the county's suite of vegetation ecosystems. While wildfire is rare at these high elevations, mention of its associated plants types is warranted. Extreme weather conditions with strong, frequent winds and cold temperatures help limit what plants can grow there. Most alpine plants are perennial grasses and forbs but willows may be found in protected

ravines and shallow drainages. Cushion plants, looking like ground-hugging clumps of moss, escape the strong winds blowing a few inches above them. Where tundra soil is well-developed, grasses and sedges are common. Non-flowering lichens cling to rocks and soil.

## **VALUES AT RISK**

In any type of risk assessment, human welfare and life safety receive highest priority in both tactical and strategic planning. The mitigation recommendations presented in this report are based on this predication. Creating fire-safe zones around structures, reducing structural ignition potential, and ensuring adequate and safe evacuation is essential. This mitigation directly addresses the primary goal of reducing the threat wildfires may pose to human welfare and life safety of residents and emergency responders alike.

The content and priority level of all other perceived values potentially at-risk due to wildfire is certainly subject to personal opinion and may vary greatly from person to person or community to community. Generally however, several major categories were documented from community meetings and the citizen survey results displayed in Appendix D.

### **Private residences**

- Homes
- Property
- Other assets
- Lifestyle

### **Essential Infrastructure**

- Power
- Water
- Transportation
- Communication
- Emergency services

### **Public Facilities**

- Schools
- Public administration buildings
- Libraries
- Recreation centers

### **Commercial Infrastructure**

- Retail businesses
- Service providers
- Industrial facilities

### **Historical infrastructure**

- Homes
- Commercial buildings
- Mining
- Cemeteries

**Tourism**

- Casino gambling
- Outdoor recreation
- Scenic areas

**Public lands**

- State parks
- Watersheds
- County open space
- National Forests
- Wilderness areas

With nearly 60% of county revenue based on casino gaming, Gilpin County may be in a more vulnerable position than other more diversified areas should this single-stream cash flow experience significant interruption from a large scale fire.

Gilpin County is a beautiful place to live, work, and play, offering quality-of-life fulfillment on many levels. However, as a fire-prone or fire-adapted ecosystem, Gilpin County residents have assumed a certain level of risk by living in such an area. Fortunately, definitive and achievable measures can be taken to significantly reduce wildfire hazards and the risk of loss to the values that county residents consider important. Those measures are outlined in this report.

# COLLABORATION: COMMUNITIES/AGENCIES/STAKEHOLDERS

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## CORE TEAM AND PROJECT STAKEHOLDERS

CWPP development is defined by HFRA as a collaborative process that involves local government, local fire authorities, state forest management agencies, relevant federal land management agencies, as well as a broad range of other interested stakeholders.

The initial step involves organizing an operating group to serve as the core decision-making team. At a minimum, HFRA requires the Core Team to be comprised of representatives from local government, local fire authorities, and the state forest management agency. For Colorado this is the Colorado State Forest Service (CSFS). Together, these entities form the decision-making team responsible for the development of the CWPP and must mutually agree on the plan's final contents, as outlined in HFRA. The Gilpin County Core Team members are listed in the table below.

**Table 2. Gilpin County Core Team Members**

Team Member	Organization
Roger Baker	Gilpin County Manager
Allen Owen	Colorado State Forest Service
Ryan Roberts	Chief, Timberline Fire Authority
Bob Norris	Chief, Black Hawk Fire Department
Gary Allen	Chief, Central City Fire Department
George Greenwood	Anchor Point Group
Chris White	Anchor Point Group

As a majority holder of managed lands within the region, activities of the USFS play a critical role in directing forest management and treatment in the county. HFRA directs the CWPP core team to consult with agency representatives throughout the planning process.

**Table 3. USFS Team Member**

Team Member	USFS Department
David Niemi	Fire Management Officer, Arapahoe Roosevelt National Forest

In order to ensure the final document reflects true community priorities, substantive input was sought from a broad range of local stakeholders. These include active and organized neighborhood associations, community forestry or land management groups, as well as other stakeholder groups or individuals that display a commitment to fire protection and fuels management. The extensive stakeholder group for the Gilpin County CWPP is listed in the table below.

**Table 4. Gilpin County Stakeholders**

Team Member	Organization
Irene Shonle	CSU Extension Gilpin County
Tom Lambrecht	President, Greater Rollinsville Community Assoc.
Bruce Hartman	Gilpin County Sheriff's Office
Richard Bulich	Timberline Fire Authority
Nan Harvey	Colorado Beetle Initiative
Wes Isenhardt	President, Gilpin County Citizens Initiative
Phil Headrick	Golden Gate Canyon State Park FMO
Dan Weber	Golden Gate Canyon State Park Manager
Bill Carpenter	CFA VP, Landowner, TF, Ag Tax
Earl Robinson	Gilpin Road and Bridge, Head
Jeanne Nicholson	County Commissioner
Kathleen Gaubatz	Clear Creek County OEM
Doris Beaver	
Michelle Northrup	Missouri Lakes HOA
Barbara Thielemann	Central City
Jim Russell	Gilpin County, GIS
Gail Maxwell	
Chris Patrick	
Laurie Brandau	Timberline Fire Authority
Bill Bergen	Meadowlake Mtn Acres (Thorne Lake) POA

## STRATEGIC PLANNING

Several stakeholder meetings were held during the development of the CWPP. The initial stakeholder “kickoff” meeting, held October 6, 2008 at the Timberline Fire Authority Station 7, brought together CWPP “Core Team” members. Included were County officials, local fire agencies, CSFS, local land management agencies, neighborhood associations, and other prominent stakeholders. Discussion focused on the scope of the project, desired outcomes, and agency participation. The meeting covered introductions, methodology, stakeholder goals, project management, mapping data, and a regional map review. The group delineated and defined the county’s community and neighborhood zones that would be targeted for assessment. The attendees at this meeting are listed in the table below.

**Table 5. Stakeholder Kickoff Meeting Attendees**

Attendees and Affiliation	
Bob Oatman	President, Dory Lakes POA
Wes Isenhardt	President, Gilpin County Citizens Initiative
Doris Beaver	Not listed
Michelle Northrup	Missouri Lakes HOA
Barbara Thielemann	Central City
Kathleen Gaubatz	Clear Creek County OEM
Irene Shonle	CSU Extension Gilpin County
Billie Carpenter	Private Forest Landowner
Robert Norris	Black Hawk Fire Dept
Earl Johnson	Gilpin County Road and Bridge Dept
Jim Russell	Gilpin County
Allen Owen	CSFS - Boulder
Roger Baker	Gilpin County
Phil Headrick	Colorado State Parks
Gary Allen	Central City Fire Dept
Jeanne Nicholas	Gilpin County
Gail Maxwell	Timberline Fire Authority
Bob Grancola	Not listed
Chris Patrick	Not listed
Laurie Brandau	Timberline Fire Authority
Ryan Roberts	Timberline Fire Authority
George Greenwood	Anchor Point Group
Chris White	Anchor Point Group



A second stakeholder meeting was held February 5, 2009 at the Timberline Fire Authority Station 7, to review community hazard and risk assessments and mitigation recommendations. Details of the CWPP development and community assessment processes were presented, as were mitigation recommendations for each community. Extent of the Gilpin County Wildland Urban Interface buffer was discussed and several community boundaries were extended or modified. The attendees at this meeting are listed in the table below.

**Table 6. Second Stakeholder Meeting Attendees**

Stakeholder	Organization
Irene Shonle	CSU Extension, Gilpin County
Tom Lambrecht	Greater Rollinsville Community Assoc
Bruce Hartman	Gilpin County Sheriff's Office
Forrest Whitman	Gilpin County Commissioner
Buddy Schmaltz	Gilpin County Commissioner
Wes Isenhardt	President, Gilpin County Citizens Initiative
Phil Headrick	Golden Gate Canyon State Park FMO
Allen Owen	CSFS Boulder
Roger Baker	Gilpin County Manager
Earl Robinson	Gilpin Road and Bridge, Head
Jeanne Nicholson	County Commissioner
Gail Maxwell	Chair CSFPD, Co-Chair Timberline FA
Laurie Brandau	Timberline Fire Authority
George Greenwood	Anchor Point Group
Chris White	Anchor Point Group

## COMMUNITY OUTREACH

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

In addition to the stakeholder meetings a series of advertised public meetings were held to generate direct feedback from county residents on the CWPP development process, community assessment results, and specific community mitigation recommendations. These meetings included:

- February 5<sup>th</sup> – Timberline Fire Authority Station 7 – A public open house following the stakeholder meeting. Approximately 45 people attended.
- March 12<sup>th</sup> – Timberline Fire Authority Station 7 – Formal public meeting. 7 people attended.
- March 14<sup>th</sup> – Gilpin County Community Center – Formal public meeting following the Gilpin County Wildfire Symposium. Approximately 35 people attended.

Throughout the CWPP development process a unique web-based communication tool was provided to all CWPP stakeholders. This tool allowed communication between project team members and stakeholders. Access to the web site was provided to the general public upon the release of the draft report to facilitate submission of public feedback to the project team.

A county-wide resident survey was provided through the Gilpin County website. This on-line resource was made available, to the public, and was launched on 2/04/2009 and was closed on 04/23/2009. 230 people visited the survey site during that time. Results were utilized in the development of this report and are detailed in Appendix D.

Overall the following goals were expressed by the residents and were common themes at public meetings:

- Consideration of infrastructure ( for example – significant electric transition lines)
- Protection of private homes / public buildings
- Provision of adequate evacuation
- Protection / consideration for watersheds

# COMMUNITY ASSESSMENT

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## METHODOLOGY

A comprehensive community wildfire assessment takes into account a wide variety of factors in order to fully identify and characterize wildfire risks and hazards associated with each neighborhood or community.

Generally these factors include:

- Proximity to and characteristics of hazardous fuels;
- Predicted fire behavior;
- Topographic position and orientation;
- Historical fire occurrence;
- Local ignition risk;
- Forest condition;
- Weather characteristics and trends.

Predominant community characteristics evaluated include:

- Structure flammability;
- Defensible space;
- Access; and
- Availability of emergency resources

Predominant community characteristics are also identified, assessed, and combined with these features to provide a full understanding of a community's relative hazard and risk level. By carefully analyzing the relationship between all these elements, including input from local residents, an accurate hazard model can be developed that provides valuable guidance for developing effective mitigation recommendations and logical treatment prioritization.

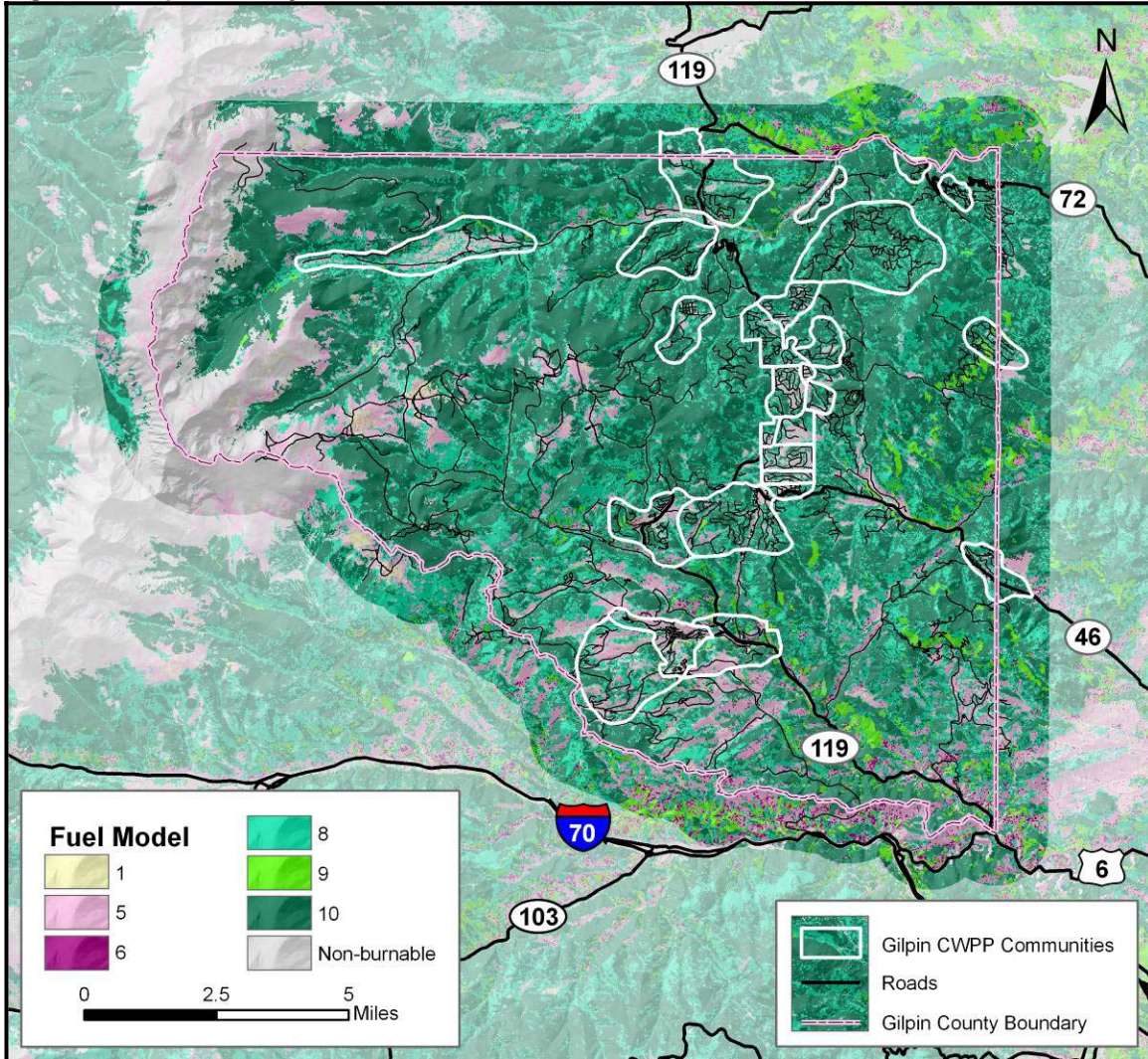
The primary assessment area for this CWPP is defined by the boundary of Gilpin County. Fifteen individual communities or subdivisions were identified as areas of significant concern by the stakeholder team and surveyed, in detail, with the methodology outline above. Evaluations and recommendations of seven additional neighborhoods from the previous Colorado Sierra CWPP project are also included. See **Map C-3** in **Appendix C** for the Community Hazard Rating map.

With stakeholder input, a three mile buffer was established around these identified communities to serve as the county's Wildland Urban Interface (WUI) boundary. Mitigation treatments within the WUI boundary better qualify for National Fire Plan funding than those located in remote regions away from identified population centers or values at risk. Refer back to **Figure 1** on page five or **Map C-1** in **Appendix C** for the WUI boundary map.

## WILDLAND FUELS OF GILPIN COUNTY

Unless structural density is high, existing vegetation is the primary fuel source for wildland fire and has a direct effect on fire behavior. By categorizing vegetation types into specific fuel models and associating unique expected fire behavior with each model, a basis for predictive computerized fire behavior modeling is established. Generally there are seven characteristics used to categorize fuel models: Fuel loading; size and shape; compactness; horizontal continuity; vertical arrangement; moisture content; chemical and mineral content.

Figure 3. Gilpin County Fuels



The most commonly used fuel modeling methodology was developed by H.E. Anderson (1982). In this system, thirteen unique fuel models are presented in four fuel groups: grasslands, shrublands, timber litter and understory, and logging slash. The most common fuel models observed in Gilpin County, as defined by the Anderson-13 system, are defined in the following table. Descriptions of each fuel model, along with a detailed analysis of fire behavior potential in the study area, can be found in **Appendix A**.

**Table 7. Gilpin County Fuels Descriptions**

FBFM	Description
1. Short Grass	<b>Grass Group</b> – Fire spread is determined by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. These are surface fires that move rapidly through the cured grass and associated material. Very little shrub or timber is present, generally less than one-third cover of the area. Annual and perennial grasses occur in this model. Fire rate of spread can exceed 3.5 miles per hour (300 chains per hour) with flame lengths over 8 feet.
5. Brush	<b>Brush Group</b> – Fire spread generally occurs in the surface fuels that are made up of litter cast by the shrubs and the grasses or forbs in the understory. Fires are generally not very intense. Usually shrubs are short and almost totally cover the area. Young green stands with no dead wood would qualify:
6. Intermediate or Dormant Brush	<b>Shrub Group</b> – Fire spreads through the shrub layer with flammable foliage but requires moderate winds to maintain the foliage fire. Fire will drop to the ground in low wind situations. Shrubs are mature with heights less than 6 feet. These stands include oakbrush and mountain mahogany less than 6 feet tall. Fire rate of spread can be rapid with flame lengths of 6 to 10 feet.
8. Closed or Short-Needle Timber Litter–Light Fuel Load	<b>Timber Group</b> – These fuels produce slow-burning ground fires with low flame lengths. Occasional “jackpots” in heavy fuel concentrations may occur. These fuels pose a fire hazard only under severe weather conditions with high temperatures, low humidity, and high winds. These are mixed conifer stands with little undergrowth. Rate of spread is up to 106 feet per hour with flame lengths of one foot.
9. Hardwood or Long-Needle or Timber Litter–Moderate Ground Fuel	<b>Timber Group</b> – Fires run through the surface litter faster than in FBFM 8 and have longer flame lengths. These are semi-closed to closed canopy stands of long-needle conifers, such as ponderosa pine. The compact litter layer is mainly needles and occasional twigs. Concentrations of dead-down woody material contribute to tree torching, spotting, and crowning. Fire rate of spread is up to 27 chains per hour with flame lengths of 5 feet.
10. Mature/Overmature Timber and Understory	<b>Timber Group</b> – Surface fires burn with greater intensity than the other timber litter models. Dead and down surface timber litter is heavier than other timber models and the stands are more prone to hard-to-control fire behavior such as torching, spotting, and crown runs.

## MODELING FIRE BEHAVIOR POTENTIAL

Computer modeling of potential fire behavior provides valuable insight into the likelihood of particular wildfire characteristics based on a set of spatially gridded inputs and pre-determined weather variables. The analysis provides visual and tabular interpretation of probable rate of spread, flame length, and crown fire potential. Required inputs include elevation, slope, aspect, fuel models, and canopy closure. Weather inputs are calculated by averaging annual data from the closest Remote Automated Weather Station (RAWS) – in this case the Pickle Gulch RAWS – to determine most likely average (50th percentile) and extreme (97th percentile) weather conditions.

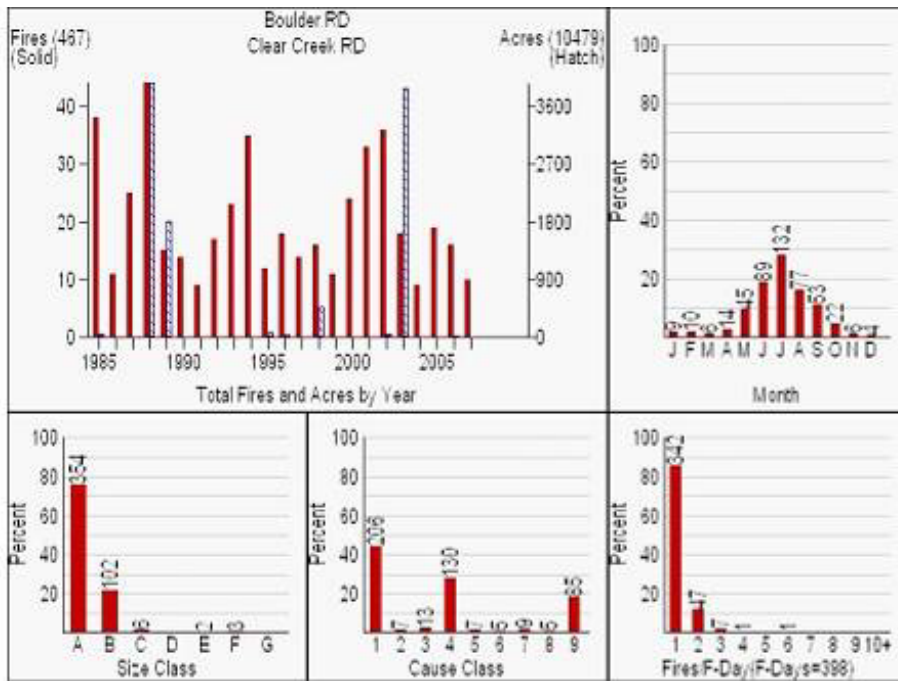
Percentile weather refers to historic occurrences of specified conditions. For example, 97th percentile conditions mean that within the weather data examined from the RAWS station, only three percent of the days had more extreme conditions. 50th percentile is approximately average with half the records exceeding recorded conditions and half the records below recorded conditions.

Outputs from the analysis are combined with detailed ground surveys, supporting the development of the most effective mitigation measures for each community. Software utilized in the analysis includes BehavePlus to estimate surface fire behavior such as expected rates of spread, associated flame lengths, and fire intensity, and FlamMap, which combines surface fire predictions with the potential for crown fire development. Methodology details and results for the Gilpin County assessment are found in **Appendix A**.

## FIRE OCCURRENCE

Fire records, for private lands, within Gilpin County were not available. Federal lands within the county, including the USFS Clear Creek and Boulder Ranger Districts were analyzed for fire occurrence. The typical fire season for the study area is defined as May through September when eighty-five percent of the fires occur. Large fires are now becoming more common throughout the entire year, especially at lower elevations. While 45% of fires in these districts were caused by lightning, over 55% were caused by non-natural ignitions. The vast majority of ignitions were contained to under an acre. Roughly 2% of ignitions account for well over 90% of total acres burned. Typically these large fire ignitions are associated with the extreme 97<sup>th</sup> percentile weather conditions.

**Figure 4. USFS Fire Data**




Fire size class: A<1/4 acre, B= 1/4 to 9 acre, C= 10 to 99 acre, D= 100 to 299 acre, E= 300 to 999 acre, F= 1,000 to 4,999 acre, G> 5,000 acre  
 Fire cause class: 1=lightning, 2= equipment, 3= smoking, 4= campfire, 5= debris burning, 6= railroad, 7= arson, 8= juveniles, 9= misc.  
 Source: US Forest Service: <http://famweb.nwrg.gov/izfast>

## FIRE REGIME CONDITION CLASS

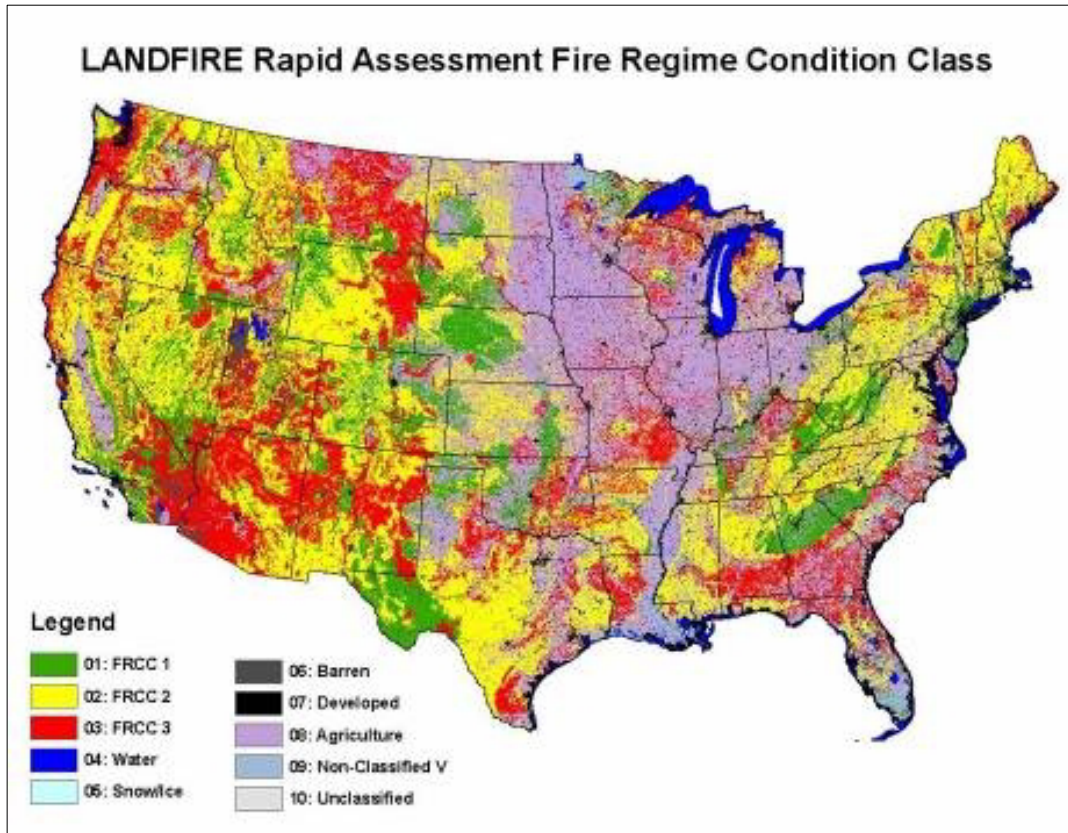
A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning. The data used for this evaluation is derived from a national scale map with a minimum mapping unit of 1 square kilometer, and should not be confused with potential fire behavior output models. Fire Regime Condition Class (FRCC) is a conceptual tool that is used to measure the amount of departure from an expected natural condition that would exist in the absence of aggressive fire exclusion management policies. FRCC may be utilized, in combination with other factors, to help guide management objectives and set priorities for treatments. It is often used as a proxy for the probability of severe fire effects such as the loss of key ecosystem components – soil, vegetation structure, species, or alteration of key ecosystem processes – nutrient cycles, hydrologic regimes, etc. FRCC thus serves as an index of hazards to the status of a variety of ecological components native to the study area.

**Figure 5. Fire Regime Condition Class Descriptions**



<b>Condition Class</b>	<b>Condition Class Description</b>
1	Fire regimes are within their historical range and the risk of losing key ecosystem components as a result of wildfire is low. Vegetation attributes (species composition and structure) are intact and functioning within an historical range. Fire effects would be similar to those expected under historic fire regimes.
2	Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components as a result of wildfire is moderate. Fire frequencies have changed by one or more fire-return intervals (either increased or decreased). Vegetation attributes have been moderately altered from their historical range. Consequently, wildfires would likely be larger, more intense, more severe, and have altered burn patterns, as compared with those expected under historic fire regimes.
3	Fire regimes have changed substantially from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have changed by two or more fire-return intervals. Vegetation attributes have been significantly altered from their historical range. Consequently, wildfires would likely be larger, more intense, and have altered burn patterns, as compared with those expected under historic fire regimes.

Figure 6. LANDFIRE Rapid Assessment FRCC



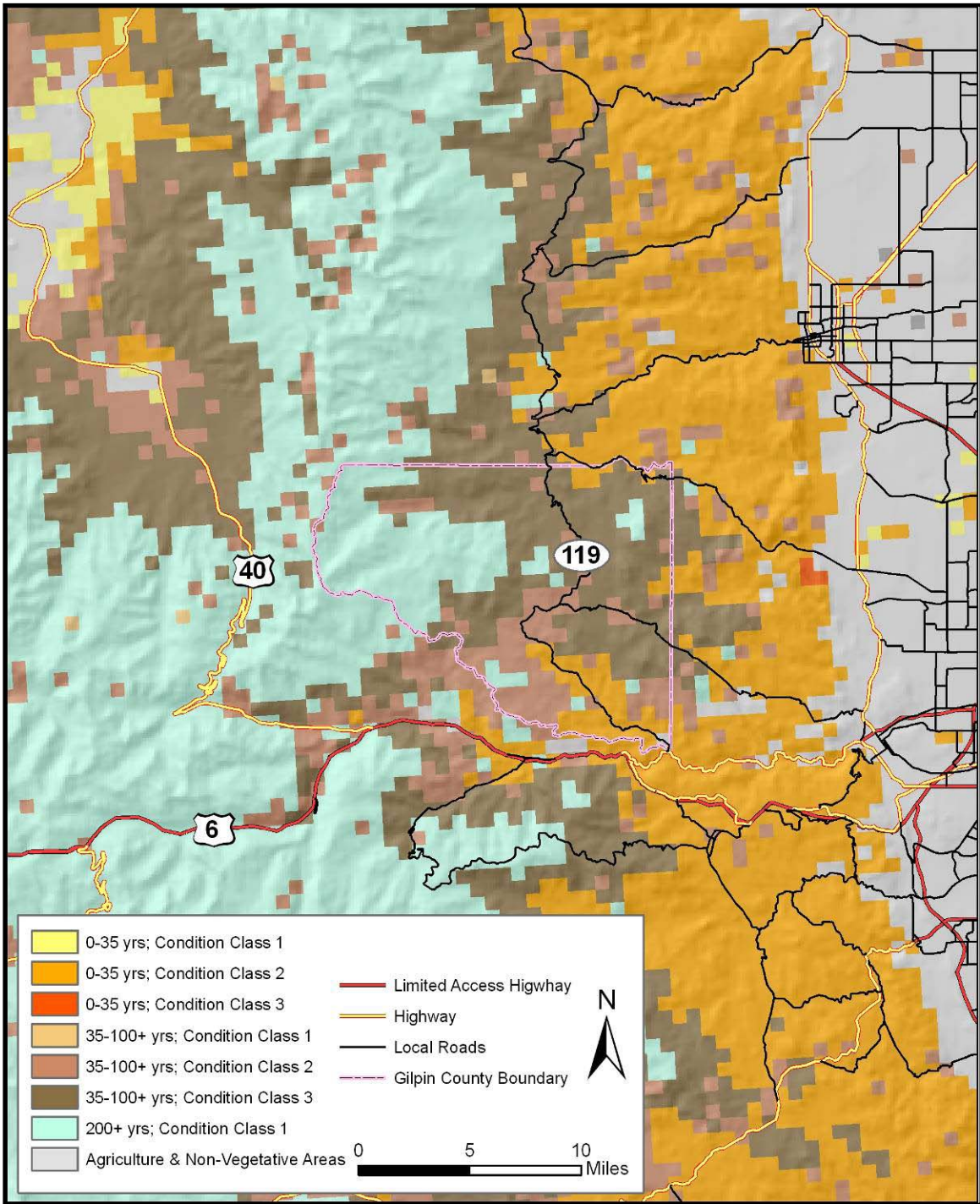
The risk of losing key ecosystem components (e.g., native species, large trees, soil) is low (green) for Class 1, moderate (yellow) for Class 2, and high (red) for Class 3.

Much of Gilpin County is dominated by FRCC 2 which indicated that historic fire regimes have been moderately altered. Consequently, wildfires are likely to be larger, more severe, and have altered burn patterns as compared with those expected under historic fire regimes. Additionally, FRCC 1 in the county reflects the presence of higher elevation lodgepole pine, which under normal historic conditions supports a fire return interval of over 200 years, which is largely unaffected by modern land management policies of fire exclusion. Historically, significant fires in these ecosystems are more severe and often classified as “stand replacement events.” This supports the assumption that even areas with a FRCC1 designation can support catastrophic stand replacement wildfire under normal historic conditions.

Please see graphic for Gilpin County FRCC on the next page.



Figure 7. Gilpin County FRCC



## COMMUNITY SURVEYS

Detailed community surveys were conducted during the fall of 2008. Eleven communities were identified through stakeholder input including the cities of Black Hawk, Central City, and unincorporated Rollinsville. Twelve additional communities delineated by common access, proximity, topography, or predominant construction characteristics were also evaluated. Each identified community is buffered by a three mile zone identified as the community's Wildland Urban Interface (WUI), allowing forest treatment recommendations to extend outside the immediate boundaries of the neighborhood.

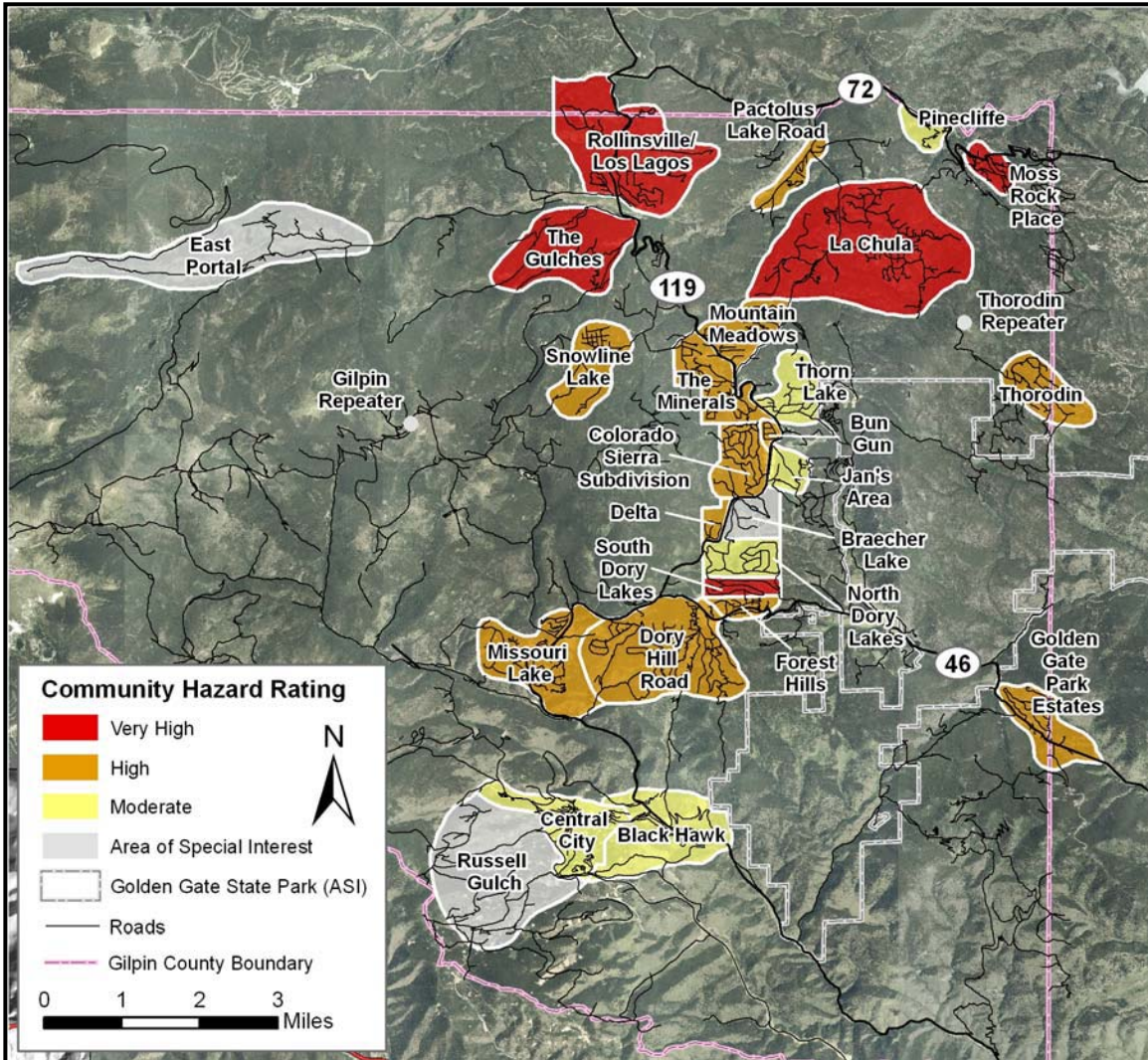
A standardized survey methodology was utilized to assess the relative level of wildfire hazard and risk for each community. This wildfire Hazard Rating system (WHR) was developed specifically to evaluate communities within the WUI and establish a relative hazard rating scale. The WHR combines physical infrastructure such as structure density and roads, and fire behavior components such as fuels and topography, with the field experience and knowledge of wildland fire experts. It has been proven and refined by use in rating over 1,500 neighborhoods throughout the United States.

Surveys assess predominant characteristics within a WUI as they relate to structural ignitability, fuels, topography, expected fire behavior, emergency response resources, and ultimately human safety and welfare. Scores are assigned to each element and then totaled to determine the relative level of risk for each individual community. Low, moderate, high, and extreme hazard ratings are assigned based on the total community score.

These comprehensive community assessments provide the basis for effective identification, prioritization, and implementation of specific mitigation and hazard reduction recommendations. Individual community survey details including contributing factors, mitigation recommendations, and community treatment maps are located in **Appendix B**.

Please see the community hazard rating map and corresponding table on the next page.

**Figure 8. Gilpin County Community Hazard Rating Map**



**Table 8. Gilpin County Communities by Hazard Rating**

1. Rollinsville / Los Lagos	13. Forest Hills
2. The Gulches	14. Missouri Lake
3. La Chula	15. Dory Hill Road
4. Moss Rock Place	16. Golden Gate Park Estates
5. South Dory Lakes	17. Pactolus Lake Road
6. Snowline Lake	18. Pinecliffe
7. Mountain Meadows	19. Thorn Lake
8. The Minerals	20. Jan's Area
9. Thorodin	21. North Dory Lakes
10. Colorado Sierra Subdivision	22. Central City
11. Bun gun	23. Black Hawk
12. Delta	[Intentionally left blank]

# **MITIGATION SOLUTIONS**

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## **OBJECTIVES OF MITIGATION**

Wildfire hazard mitigation may be interpreted as any action taken to reduce the likelihood of loss from a wildfire. Effective mitigation solutions may be accomplished through a variety of actions including creating defensible space around home and subdivisions, upgrading individual homes with fire resistant building material and improving access and addressing, ensuring adequate and safe community evacuation routes, hazardous fuel reduction along access routes, strategic landscape forest treatments, enhancing emergency preparedness and response capabilities, upgrading current infrastructure, and developing programs that foster community awareness and neighborhood activism.

Mitigation recommendations presented in this report were derived through careful analysis of community field survey results, the latest available geographical information system data (GIS), input from some of the region's top wildfire professionals, and scientifically validated with advanced predictive fire behavior modeling analysis. Each community is individually assessed to determine the unique hazards and risks facing the area in order to formulate the most effective and achievable mitigation strategies to reduce the threat, keeping in mind that human welfare and life safety are the highest priority.

The CWPP process stresses homeowner involvement at all levels. This includes community activism but also guides interested homeowners to set an example through the implementation of defensible space and building improvements to lessen the likelihood of structural ignition. When properly implemented, fuel reduction and individual home improvements can effectively minimize wildland fire behavior and structural ignition risks around any home. Further, in the absence of defensible space, the effectiveness of adjacent or nearby landscape level forest treatments is minimized. In some neighborhoods, homes are constructed in sufficient density that coordinated defensible space efforts on adjacent lots can have a positive impact on a much larger scale. Finally, mitigation efforts by the homeowner on private land are stressed because these actions could start today. No consensus, grant applications, or environmental impact statements are necessary to proceed. This action is totally dependent on the incentive and motivation of the individual.

## **COMMUNITY AWARENESS AND EDUCATION**

The long term success of any CWPP hinges on the ongoing mitigation implementation efforts of communities, neighborhoods, and individual home owners. The most effective means to initiate and maintain local interest and support is through public outreach efforts and community education. CWPP stakeholders or other motivated individuals can organize meetings and presentations at the community, subdivision, or homeowner association level. These events are great opportunities to share information concerning wildfire hazards and risks inherent to the area and to educate residents about all effective measures that can be implemented individually or at the community level to reduce those threats. Often home mitigation can be initiated through organized spring clean-up programs involving the coordination of a central disposal site, mobile chipping, or hauling services. Organizing an annual "slash day" is a great way to motivate

homeowners to reduce hazardous fuel loads around their property. Coordinating with local Boy/Girl Scout Troops, or other youth organizations, looking for innovative community service projects is another possible avenue to initiate action.

Community and stakeholder involvement is a critical component of developing a successful CWPP, but the same is true of implementing, sustaining, and monitoring the plan over time. It is important to maintain momentum within the community after the CWPP is completed. Ongoing supporting actions may also include grant application efforts, county ordinances revisions requiring mitigation prior to building permit awards, pre-suppression planning, maintenance and expansion of slash collection sites, resource mapping updates, and ongoing collaboration and planning with neighboring agencies and jurisdictions.

## **DEFENSIBLE SPACE AND STRUCTURAL IGNITABILITY**

An aggressive program of evaluating and implementing defensible space for homes will do more to limit fire-related property damage than any other single recommendation in this report.

Of all the factors that contribute to a structure's ability to survive a wildfire, a home's roofing material and the quality of the defensible space surrounding the structure have been found to be the most important. Defensible space is an area around a structure where flammable vegetation is treated, cleared or reduced to slow the spread of wildfire towards the structure. It also reduces the chance of a structure fire moving from the building to the surrounding forest. Additionally, defensible space provides room for firefighters to try and protect the structure. A house is more likely to withstand a wildfire if grasses, brush, trees and other common forest fuels are managed to reduce a fire's intensity.

Creating defensible space is largely a voluntary endeavor. However, in recent years insurance companies have been independently inspecting insured properties from a wildfire hazard perspective, and many counties have adopted defensible space ordinances affecting new home construction, roof replacement, or remodels when a building permit is involved. These regulations are adopted in order to mitigate the increasing hazards associated with the spread of development into less accessible and more heavily vegetated areas.

Neighboring counties have adopted building code or other criteria for effective defensible guidelines that are based on those set forth in the Colorado State Forest Service's Creating Wildfire Defensible Zones, Bulletin No. 6.302 (Dennis 2003). The publication outlines practical and common-sense guidelines for the creation of an effective defensible space around structures and other values at-risk, as follows.

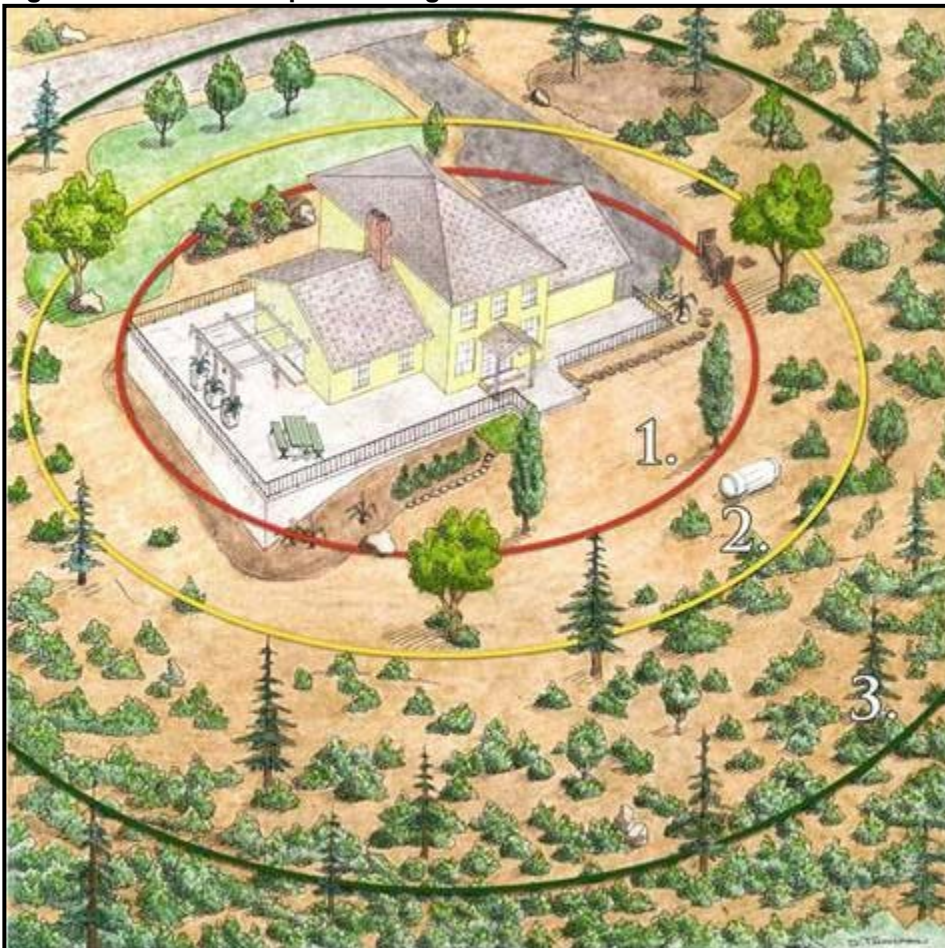
Use fire-resistive materials (Class C or better rating), not wood or shake shingles, to roof homes in or near forests and grasslands. When a roof needs significant repairs or replacement, do so with a fire-resistant roofing material. Check with the county building department. Some counties now restrict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

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

Creating an effective defensible space involves developing a series of management zones in which different treatment techniques are used. Develop defensible space around each building on a property. Include detached garages, storage buildings, barns and other structures in the plan.

The actual design and development of defensible space depends on several factors: size and shape of buildings, materials used in their construction, the slope of the ground on which the structures are built, surrounding topography, and sizes and types of vegetation on the property. These factors all affect design. Additional guidance is available from the Boulder District of the Colorado State Forest Service , the fire department or specialized defensible space contractors.

**Figure 9. Defensible Space Management Zones**



The following describes the “Zone” concept guidelines utilized in the creation of defensible space.

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

Plant nothing within 3 to 5 feet of the structure, particularly if the building is sided with wood, small diameter logs (< 6” tip diameter) or other flammable materials. Decorative rock, for example, creates an attractive, easily maintained, nonflammable ground cover.

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

Frequently prune and maintain plants in this zone to ensure healthy growth. Remove dead branches, stems and leaves. Do not store firewood or other combustible materials in this area. Enclose or screen decks with metal screening. Extend the gravel coverage under the decks. Do not use areas under decks for storage.

Ideally, remove all trees from Zone 1 to reduce fire hazards. If you do keep a tree, consider it part of the structure and extend the distance of the entire defensible space accordingly. Isolate the tree from any other surrounding trees. Prune it to at least 10 feet above the ground. Remove any branches that interfere with the roof or are within 10 feet of the chimney. Remove all “ladder fuels” from beneath the tree. Ladder fuels are vegetation with vertical continuity that allows fire to burn from ground level up into the branches and crowns of trees. Ladder fuels are potentially very hazardous but are easy to mitigate. No ladder fuels can be allowed under tree canopies. In all other areas, prune all branches of shrubs or trees up to a height of 10 feet above ground (or 1/3 the height, whichever is the least).

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

Thin trees and large shrubs so there is at least 10 feet between crowns. Crown separation is measured from the furthest branch of one tree to the nearest branch on the next tree. On steep slopes, allow more space between tree crowns. Remove all ladder fuels from under these remaining trees. Carefully prune trees to a height of at least 10 feet. Small clumps of 2 to 3 trees may be occasionally left in Zone 2. Leave more space between the crowns of these clumps and surrounding trees.

**Table 9. Tree and Shrub Spacing**

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

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

Isolated shrubs may remain, provided they are not under tree crowns. Prune and maintain these plants periodically to maintain vigorous growth. Remove dead stems from trees and shrubs annually.

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

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

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

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

Dispose of slash (limbs, branches and other woody debris) from trees and shrubs through chipping or by piling and burning. Contact the CSFS office, fire department or county sheriff's office for information about burning slash piles. If neither of these



alternatives is possible, lop and scatter slash by cutting it into very small pieces and distributing it over the ground. Avoid heavy accumulations of slash. Lay it close to the ground to speed decomposition. If desired, no more than two or three small, widely spaced brush piles may be left for wildlife purposes. Locate these towards the outer portions of the defensible space.

**Zone 3** is an area of traditional forest management and is of no particular size. It extends from the edge of the defensible space to the property boundaries. A gradual transition into this zone from defensible space standards is suggested. Typical management objectives for areas surrounding home sites or subdivisions are: provide optimum recreational opportunities; enhance aesthetics; maintain tree health and vigor; provide barriers for wind, noise, dust and visual intrusions; support limited production of firewood, fence posts and other forest commodities; or grow Christmas trees or trees for transplanting.

**Table 10. Tree Spacing, Zone 3 D-Space**

Minimum tree spacing for Zone 3	
Tree Diameter (inches)	Average Stem Spacing Between Trees (feet)
3	10
6	13
9	16
12	21
15	26
18	31
21	36
24	42

Specific requirements will be dictated by the objectives for the land and the kinds of trees present. Forest management in Zone 3 is an opportunity for increased health and growth rate of the forest in this zone. Keep in mind that root competition for available moisture limits tree growth and ultimately the health of the forest.

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

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

While pruning is not generally necessary in Zone 3, it may be a good idea from the standpoint of personal safety to prune trees along trails and fire access roads. Pruning helps reduce ladder fuels within the tree stand, thus enhancing wildfire safety.

Mowing is not necessary in Zone 3. Any approved method of slash treatment is acceptable for this zone, including piling and burning, chipping or lop-and-scatter.

### Special Recommendations

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

### Brush and shrubs

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

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

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

**Table 11. D-Space Size for Grass Fuels**

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

### Grasses

Keep dead, dry or curing grasses mowed to less than 6 inches throughout the year.

Simply applying this practice in areas where grass is the predominant fuel enables homeowners to reduce the size of defensible space with no negative impact on effectiveness.

### Windthrow

In Colorado, certain locations and tree species, including lodgepole pine and Engelmann spruce, are especially susceptible to damage and uprooting by high winds (windthrow). If there is evidence of this problem in or near the defensible space, consider the following adjustments to the defensible space guidelines.

### Adjustments

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

Also consider leaving small clumps of trees and creating small openings on their lee side (opposite of the predominant wind direction). Again, a professional forester can help design the best situation for each specific homesite and tree species. Remember, with species such as lodgepole pine and Engelmann spruce, the likelihood of a wildfire

running through the tree tops or crowns (crowning) is closely related to the overabundance of fuels on the forest floor. Be sure to remove downed logs, branches and excess brush and needle buildup.

It is highly recommended that a professional forester specializing in defensible space be contact to help design an effective and aesthetically pleasing defensible space.

### **Maintaining Defensible Space**

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

### **Defensible Space and FireWise Annual Checklist**

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

### **Structural Ignitability**

Improving the fire-resistant characteristics of a structure goes hand-in-hand with the development of defensible space. Common structural fuel hazards associated with homes in the WUI include:

- Combustible roofing and siding
- Combustible decks with exposed undersides
- Combustible material under decks
- Open attic vents
- Combustible fencing
- Woody debris in gutters

As mentioned above, the most significant improvement that can be made to many of the homes in fire-prone regions is the replacement of wood shake roofing with noncombustible roofing material, as is required for building permits in many Colorado counties. Gutters should be regularly cleared of all combustible debris such as pine needles and leaves. Screening of gutters and roof vents is recommended.

### **Home Addressing**

Home addressing, although a crucial component of effective emergency response is often overlooked by residents in rural areas. Many areas in Gilpin County were found to have inconsistent or missing addressing for private homes. Local fire response may know these areas and the people who live there, but in larger scale incidents, out of area resources may not be familiar with the community. Installing standardized reflective address signage on a non-combustible pole at the base of the driveway is therefore highly recommended throughout the study area.

### **References**

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

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

## COMMUNITY ACCESS AND EVACUATION

A community's access characteristics are an important component to its overall hazard profile. They not only dictate the efficiency of residential evacuation in the event of an emergency but also influence the effectiveness and safety of emergency responders. An optimal access profile provides for multiple points of ingress and egress on roads that support two-way traffic flow. Adequate turnarounds on dead-ends and cul-de-sacs for emergency apparatus are essential.

The Gilpin County assessment reviewed access characteristics of each identified neighborhood area, highlighting potentially hazardous situations. Elements such as single points of entry, restricted dead-ends, tight switchbacks, restricted traffic flow, and road grade was evaluated. Recommended improvements may be as straight forward as seasonal grading, constructing or improving turnarounds at dead-ends, widening a restricted road section or switchback to support fire apparatus access. In situations where single point of access to a neighborhood or community was observed, careful attention was given to surveying possible secondary emergency access routes. Typically these routes exist but are often unimproved 4WD "backdoor" roads providing access to main roads or other subdivisions. Improving these routes to support a class of vehicle that are common to mountain families such as all-wheel-drive cars, updating appropriate emergency planning documents, and educating residents will go a long way to mitigate an inadequate road system.

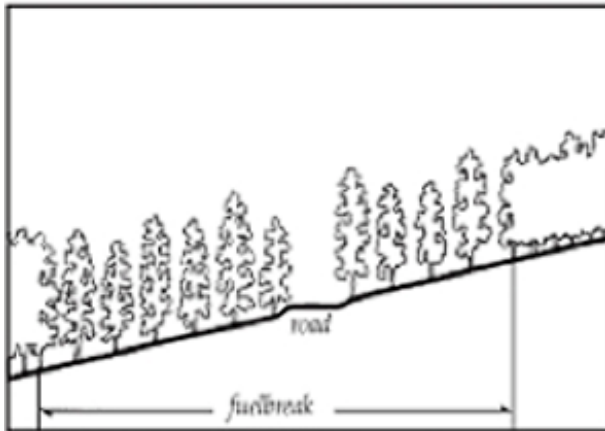
In most situations involving primary and secondary access and evacuation routes, corresponding roadside forest thinning and seasonal maintenance are recommended. Thinning prescriptions along roads provide a cost effective means to interrupt forest canopy continuity along an easily accessible corridor, and at the same time, enhance the safety of evacuation and emergency operations. Roadside fuel breaks also serve suppression efforts with safe and accessible anchor points from which to base suppression efforts or firing operations. Detailed recommendations for individual communities are located in **Appendix B**.

## ROADSIDE THINNING AND LANDSCAPE FUEL TREATMENTS

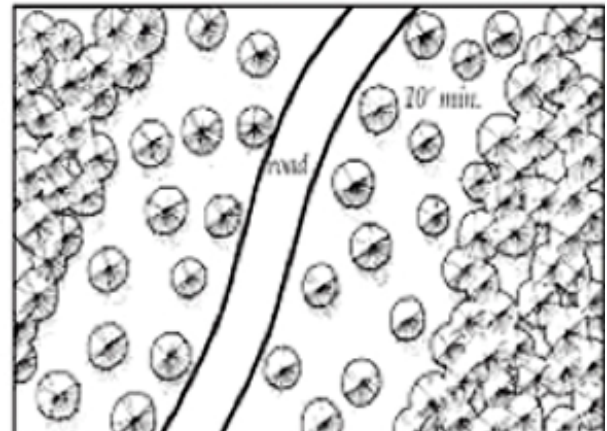
While defensible space implementation treats hazardous fuels close to individual structures, broader landscape level fuel modification practices known as fuel breaks or shaded fuel breaks are implemented on a neighborhood or community scale. They may be constructed along primary access routes to facilitate evacuation or strategically implemented along exposed community margins based on expected potential fire behavior. Any fuel break by itself will not stop a wildfire. It is a location where the fuel has been sufficiently reduced to increase the probability of success for fire suppression and evacuation activities. Ground resources can use the location for direct attack or firing out. Air resources can use the location for fire retardant drops. The public and responding emergency resources can use the location for more efficient ingress and egress.

The fuel break recommendations in this report (see **Appendix B**) emphasize utilizing existing roadways as an anchor for fuel modification for several reasons. Fuel breaks are designed to interrupt the continuity of the forest canopy, creating sufficient vertical and horizontal gaps in the fuel load to drop a crown fire out of the trees and onto the ground. In essence, it creates a landscape that will only support a surface fire, strategically located, that can be more easily suppressed.

**Figure 10. Principles of shaded fuel breaks**



*Cross-section of a typical fuel break built in conjunction with a road.*



*Plan view of fuel break showing minimum distance between tree crowns.*

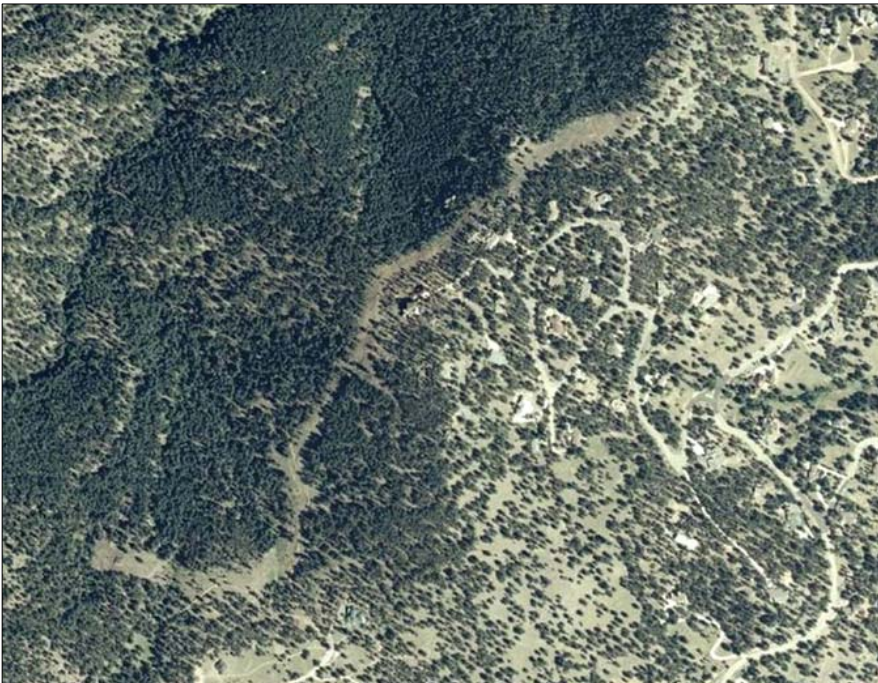
Roadside thinning strategies offer greater cost efficiencies than landscape treatments with harder access. The road reduces wood and biomass removal and therefore much less cutting per acre treated is required to achieve fuel break guidelines. Finally, there is an added benefit of creating a safer evacuation route.

**Figure 11. An Example of Roadside Thinning**



Using shaded fuel break principals, landscape fuel treatment zones are recommended in this report wherever: community margins conflict with potentially significant fire behavior from the surrounding wildlands; roadside shaded fuel breaks can be connected; or the proximity of existing or proposed treatment on public lands warrants a collaborative cross-boundary project. In the summer, this thinning project will “fill-in” with green aspen leaves.

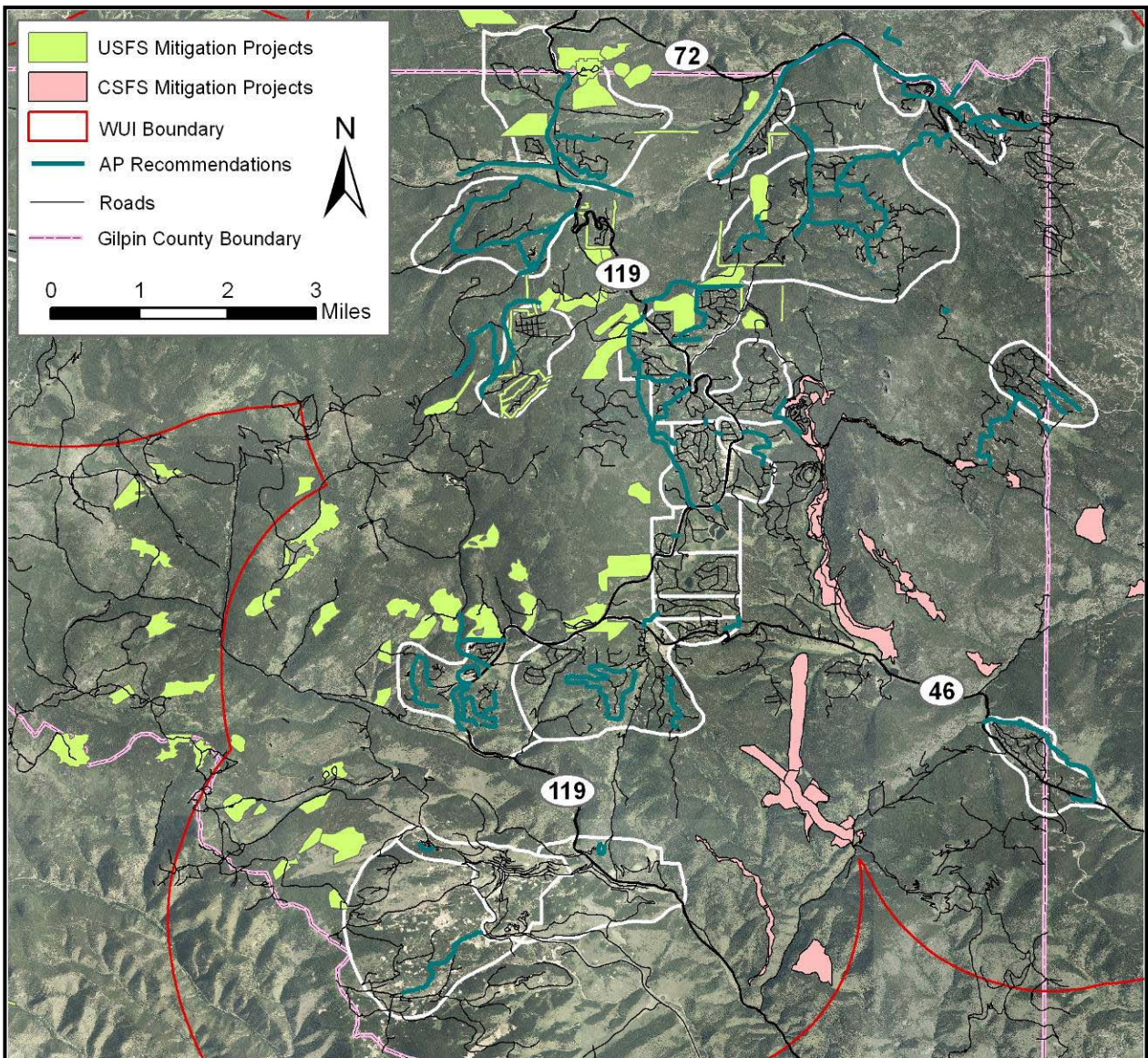
**Figure 12. Aerial Photo of Fuel Breaks**



## AGENCY COLLABORATION AND CROSS-BOUNDARY PROJECTS

Gilpin County, like much of the Rocky Mountain region, is home to significant holdings of public lands. State and Federally managed lands account for nearly 50,000 acres of Gilpin County's total land mass of 96,000 acres. Most all of the communities and neighborhoods assessed in this plan share a boundary with state or federal forests. Similar forest management challenges face all land management agencies and include over-crowded even aged timber stands, hazardous fuel loading, drought stress, insect infestation, as well as the expansion of residential development to the margins of public lands.

**Figure 13. Agency Collaboration and Cross-Boundary Projects**





Despite shrinking budgets, both the State and the US Forest Service have been active for years in planning and implementing fuel reduction and forest management projects. These projects include completed and planned treatments within Golden Gate Canyon State Park (GGSP), as well as two major projects planned within the county through USFS efforts on federal land. In all cases, agency treatments that are developed in proximity to communities are reviewed for possible inclusion with the community mitigation plan or enhanced with adjacent treatment recommendations on private or public lands. HFRA gives priority to projects and treatment areas identified in a CWPP by directing federal agencies to give specific consideration to fuel reduction projects that implement those plans. Thus, by identifying planned agency treatments that directly support community mitigation efforts, this CWPP can help the agency prioritize that project over others that may be located in more remote sections of the forest.

### **Golden Gate Canyon State Park**

With over 12,000 acres, 35 miles of hiking trails, 150 campsites including backcountry access, as well as rustic cabins to rent, GGSP offers a wide spectrum of outdoor recreational options. With extensive year-round camping available the park is also a significant potential source for wildfire ignition. Fire managers have implemented an aggressive forest management plan that includes hundreds of acres of fuel breaks and thinning prescriptions designed to reduce the threat of wildfire escaping the park on to private lands.

### **Lump Gulch**

If funded, the Lump Gulch fuels reduction plan will be implemented on the margins of Forest Service land in an around the Rollinsville area. The primary stated goal of the project is to reduce the potential for wildfire to spread from National Forest to private lands. With many prescriptions located on or near community margins, much of this tentative project falls within the designated Gilpin County WUI buffer and has direct positive impact on communities in the area.

### **Yankee Hill**

The USFS Yankee Hill pilot project is a component of an interdisciplinary federal fuels reduction project that is being implemented in a number of diverse regions across the United States. A primary objective is to develop a standardized and repeatable methodology to integrate multiple land and resource management objectives when evaluating fuel risks. Landscape scale treatment patterns were developed based on an iterative and collaborative approach. Predictive fire behavior computer modeling was used to evaluate the effectiveness of the proposed treatments.

### **Forest Ag Program**

In addition to managing forests on state lands, the CSFS manages a program designed to help landowners manage and treat larger forested parcels on private lands. The Forest Agriculture Tax Classification Program, or Forest Ag Program, is a property tax designation given to lands used for the primary purpose of producing tangible wood products. The program is mandated by state law, managed by CSFS, and implemented by the Assessor's Office in each county. To be eligible for Forest Ag Program designation, a landowner must:

- Own at least 40 contiguous, forested acres
- Use the land to produce tangible wood products
- Have legal access to the property
- Obtain and work under a Forest Management Plan

14 property owners in Gilpin County are participating in the 2009 Forest Ag program. This represents active fuel reduction on 51 parcels covering a total of 1,139 acres.

The Forest Ag Program has several benefits. Obviously, landowners benefit through lower property taxes. Additionally, properly managed forest are generally healthier, more resilient, productive and attractive than an unmanaged forest. Reduced property taxes help landowners avoid the need to subdivide due to financial pressures and keeps these 40-acre-plus tracts of land intact. This is ecologically important since development and fragmentation makes forest management difficult and expensive to achieve. Finally, producing and selling wood products from Forest Ag properties adds to the economic base of local communities.

## GILPIN COUNTY RECOMMENDED FUELS MODIFICATION PROJECTS

The following table contains all the recommended fuels reduction projects for the Gilpin County study area. This table has been reproduced in Appendix B for easier reference to the individual graphic on which each fuels reduction project can be found. Please note that the figure references in the table below are for figures in **Appendix B**, not figure numbers in the main report.

**Table 12. Fuels Modification Projects by Priority**

Project Name	Size	Priority Level	Figure # (App. B)
Creekside Trail/Judges Road Roadside Thinning	~4,100 ft	Priority level – Very High	Figure 4
Eagles Nest Lane Roadside Thinning	~1,300	Priority level – Very High	Figure 5
Gamble Gulch Roadside Thinning	~1.3 mi	Priority level – Very High	Figure 3
The Gulches Fuel Reduction	~1,600 ft	Priority level – Very High	Figure 3
Highpoint Circle Potential Emergency Access	~1,300	Priority level – Very High	Figure 6, 15
Highway 72 Roadside Thinning	~2,500 ft	Priority level – Very High	Figure 5
Highway 119 Roadside Thinning	~1.1 mi	Priority level – Very High	Figure 2
La Chula Fuel Reduction	~1.4 mi	Priority level – Very High	Figure 4
La Chula Potential Evacuation Access	~1.9 mi	Priority level – Very High	Figure 4
La Chula Roadside Thinning	~3 mi	Priority level – Very High	Figure 4
Lower Travis Gulch Roadside Thinning	~1.2 mi	Priority level – Very High	Figure 3
Moss Rock Place Potential Emergency Access	~500 ft	Priority level – Very High	Figure 5
Moss Rock Place Fuel Reduction	~2,000 ft	Priority level – Very High	Figure 5
Moss Rock Place/Pinecliffe Fuel Reduction	~1.1 mi	Priority level – Very High	Figure 5, 18
North County Road Roadside Thinning	~2700 ft	Priority level – Very High	Figure 2
Patricia Road Fuel Reduction	~500 ft	Priority level – Very High	Figure 2
Patricia Road Roadside Thinning	~3500 ft	Priority level – Very High	Figure 2
Rollinsville / Los Lagos Potential Emergency Access	~1.1 mi	Priority level – Very High	Figure 2
Rollinsville Railroad Mowing	~2.1 mi	Priority level – Very High	Figure 2
Travis Gulch Potential Emergency Access	~1000 ft	Priority level – Very High	Figure 3
Upper Moon Gulch Roadside Thinning	~1.8 mi	Priority level – Very High	Figure 3

Badger Road/Coyote Circle Potential Emergency Access	~600 ft	Priority level - High	Figure 15
Badger Road/Coyote Circle Roadside Thinning	~2.8 mi	Priority level - High	Figure 15
Blue Spruce Road Roadside Thinning	~3,200 ft	Priority level – High	Figure 8, 9
Chalet Drive Roadside Thinning	~4,300	Priority level – High	Figure 15
Conestoga Road Potential Emergency Access	~1,400 ft	Priority level - High	Figure 8, 9
Dowdle/Stanton Drive Roadside Thinning	~1.0 mi	Priority level - High	Figure 10
Elk Meadow Lane Potential Emergency Access	~400 ft	Priority level – High	Figure 11
Feldspar Road Roadside Thinning	~4,300 ft	Priority level - High	Figure 8, 9
Golden Gate Park Estates Fuel Reduction	~1.7 mi	Priority level – High	Figure 16
Golden Gate Park Estates Roadside Thinning	~2,200	Priority level - High	Figure 16
Highway 119 Roadside Thinning	~3,700 ft	Priority level - High	Figure 14
Karlann Drive Potential Emergency Accesses (Multiple)	~3,300 ft	Priority level - High	Figure 11, 12
Missouri Gulch Road Roadside Thinning	~4,300 ft	Priority level - High	Figure 14
Missouri Lake Fuel Reduction 1	~2,800 ft	Priority level - High	Figure 14
Missouri Lake Fuel Reduction 2	~2,800 ft	Priority level - High	Figure 14
Missouri Lake Roadside Thinning	~1.8 mi	Priority level - High	Figure 14
Morning Star Circle Roadside Thinning	~1,300 ft	Priority level – High	Figure 8, 9
Mountain Meadows Drive Potential Emergency Access	~4,200 ft	Priority level - High	Figure 8, 9
Mountain Meadows Fuel Reduction	~4,200 ft	Priority level - High	Figure 8, 9
Old Dory Hill Road Fuel Reduction	~1,500 ft	Priority level - High	Figure 13
Pactolus Lake Railroad Mowing	~2.2 mi	Priority level - High	Figure 17
Pactolus Lake Road Roadside Thinning	~1,700	Priority level - High	Figure 17
Paint Brush Drive Potential Emergency Access	~2200 ft	Priority level - High	Figure 8, 9
Paint Brush Drive Roadside Thinning	~2,200 ft	Priority level - High	Figure 8, 9
Paradise Valley Parkway Roadside Thinning	~1.2 mi	Priority level - High	Figure 14
Sandau Lane Roadside Thinning	~1,700 ft	Priority level – High	Figure 8, 9
Snowline Lake Landscape Fuel Reduction	~1.1 mi	Priority level – High	Figure 7
Snowline Lake Potential Emergency Access	~2.1 mi	Priority level - High	Figure 7

Thorodin Linked Fuel Reductions	~3,000 ft	<b>Priority level - High</b>	Figure 10
Thorodin Potential Emergency Access	~1.2 mi	<b>Priority level - High</b>	Figure 10
Thorodin Repeater Fuel Reduction	~500 ft	<b>Priority level - High</b>	Figure 10
Yankee Hill Landscape Fuel Reduction	~1.7 mi	<b>Priority level – High</b>	Figure 11
Bear Mountain Road Potential Emergency Access	~4,500 ft	<b>Priority level – Moderate</b>	Figure 20
Black Hawk Landscape Fuel Reduction	~1,200 ft	<b>Priority level – Moderate</b>	Figure 23
Black Hawk Linked Defensible Spaces	~2.7 acres	<b>Priority level – Moderate</b>	Figure 23
Campground Potential Emergency Access	~300 ft	<b>Priority level – Moderate</b>	Figure 19
Central City Landscape Fuel Reduction	~900 ft	<b>Priority level – Moderate</b>	Figure 22
Dory Lakes Linked Defensible Spaces	~36 acres	<b>Priority level - Moderate</b>	Figure 6, 13, 21
Gap/Damascus Road Roadside Thinning	~3,200 ft	<b>Priority level - Moderate</b>	Figure 11, 12, 19
Pinecliffe Railroad Mowing	~1.4 mi	<b>Priority level - Moderate</b>	Figure 18
Virginia Canyon Road Roadside Thinning	~1.3 mi	<b>Priority level – Moderate</b>	Figure 22

## **MOUNTAIN PINE BEETLE<sup>1</sup>**

The following mountain pine beetle information was presented to the Front Range Fuels Treatment Partnership Roundtable, Golden, CO, January 23, 2008.

More than a dozen leading research experts from the western US and Canada met over a three-day period last week, to assess the status of our scientific knowledge of lodgepole pine ecology and fire behavior in relation to the mountain pine beetle epidemic. Their focus was on Colorado and southern Wyoming, but they also examined knowledge from many other lodgepole pine areas where mountain pine beetle epidemics are occurring.

The science team, led by Dr. Merrill R. Kaufmann (emeritus scientist, Rocky Mountain Research Station) and Mike Babler (fire initiative program manager, The Nature Conservancy), reached consensus on a series of points:

- Not all lodgepole pine forests are the same. Some forests are pure lodgepole pine established after large fires decades or centuries ago. Others are mixtures with subalpine species such as Engelmann spruce, subalpine fir, and aspen at higher elevations, or with mixed conifer species such as ponderosa pine, Douglas-fir, and aspen at lower elevations. Each type of forest has unique features of ecology and fire behavior. And lodgepole pine trees in all three types are vulnerable to attack by mountain pine beetles.
- Forests are living systems subject to constant change. It is normal and expected that many natural agents change our forests over time, including mountain pine beetles, fire, and wind. While forests losing many trees to insect attack will never look the same in our lifetime, healthy and vigorous forests will undoubtedly return in most locations.
- Lodgepole pine will not disappear from the southern Rocky Mountains. The make-up of our forests will change where mountain pine beetle causes high mortality. But we will continue to have forests dominated by or including lodgepole pine, and these forests will provide valuable ecological services and aesthetic and recreational benefits.
- Active vegetation management is unlikely to stop the spread of the current mountain pine beetle outbreak, because the beetles are so numerous and spreading so rapidly that they may simply overwhelm any of our efforts. However, judicious vegetation management between outbreak cycles may help mitigate future bark-beetle caused tree mortality in local areas.
- Though they are infrequent, large intense fires with extreme fire behavior are characteristic of lodgepole pine forests, especially during very dry and windy conditions. Such fires are a natural way for lodgepole pine to be renewed and are largely responsible for extensive pure lodgepole pine forests.

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<sup>1</sup> Kaufmann M.R., G.H. Aplet, M. Babler, W.L. Baker, B. Bentz, M. Harrington, B.C. Hawkes, L. Stroh Huckaby, M.J. Jenkins, D.M. Kashian, R.E. Keane, D. Kulakowski, C. McHugh, J. Negron, J. Popp, W.H. Romme, T. Schoennagel, W. Shepperd, F.W. Smith, E. Kennedy Sutherland, D. Tinker, and T.T. Veblen. 2008. *The status of our scientific understanding of lodgepole pine and mountain pine beetles – a focus on forest ecology and fire behavior*. The Nature Conservancy, Arlington, VA. GFI technical report 2008-2.

- In forests killed by mountain pine beetles, future fires could be more likely than fires before the outbreak. Large intense fires with extreme fire behavior are again possible. While more research is needed to learn in what ways and how long the fuels and fire environment are altered by the beetles, protection of communities and other values at risk continues to be imperative.
- Mountain pine beetle outbreaks are not likely to cause increased erosion, because they do not disturb the soils or reduce protective ground cover. In areas of high tree mortality, stream flow may increase and the timing of water delivery may be changed for decades, because of reduced canopy interception of precipitation and reduced water uptake by the trees.
- Climate changes will most likely contribute to substantial forest changes in the decades ahead. Given the climate changes in the last 20 years and projected changes for the next several decades, large fires and other natural disturbances are anticipated in many forests of Colorado and southern Wyoming. These large disturbances and other changes in growing conditions will likely contribute to restructuring many forest lands.

# EMERGENCY PREPAREDNESS

Emergency services within Gilpin County are provided by the Black Hawk Fire Department, the Central City Fire Department, and the Timberline Fire Authority – the result of a recent merger between the Colorado Sierra Fire District and the High Country Fire District.

**Figure 14** shows the location of fire stations throughout the county. **Figure 15**, on the next page indicates each community's distance to the nearest fire station.

**Figure 14. Gilpin County Fire Station Locations**

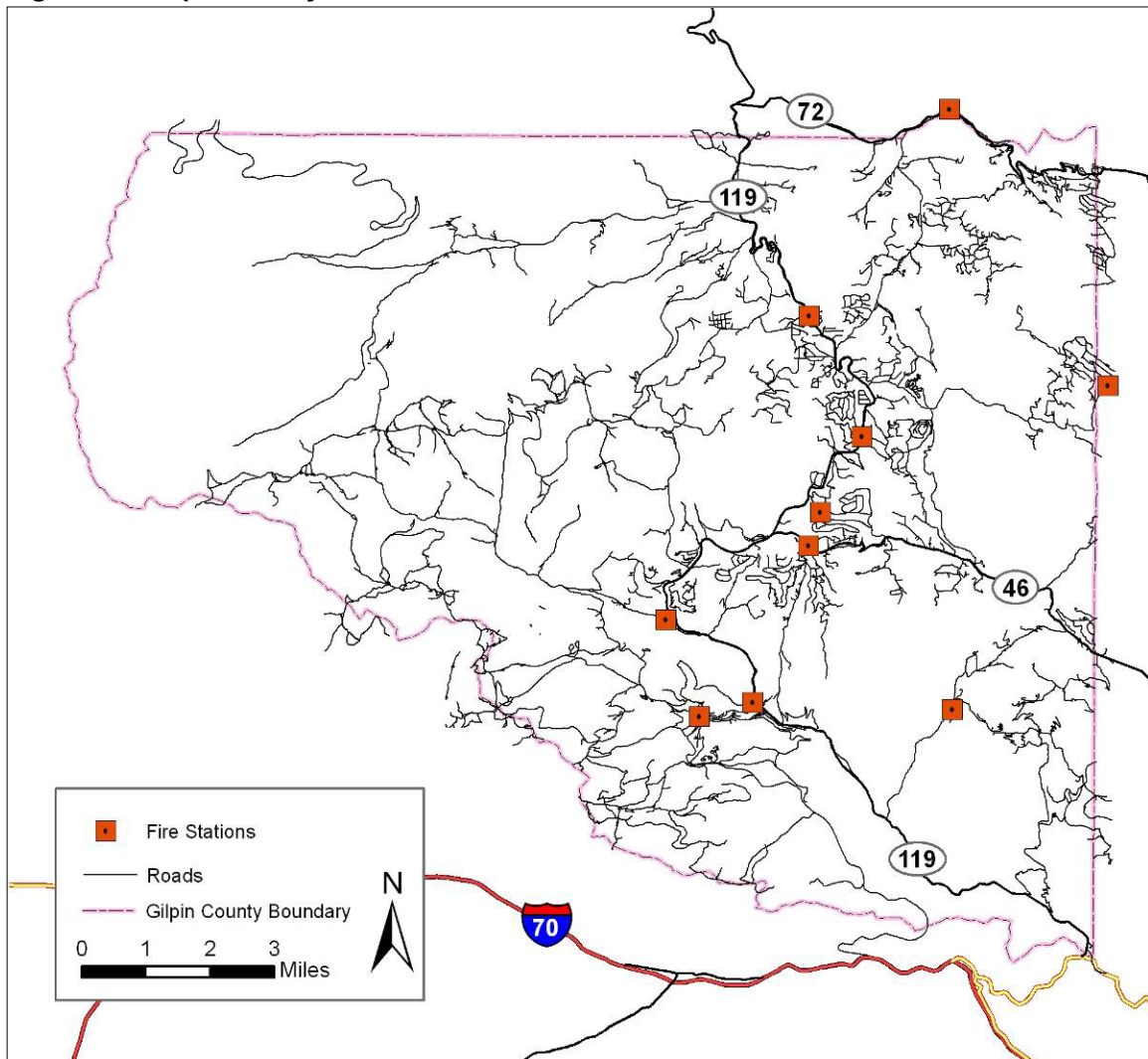
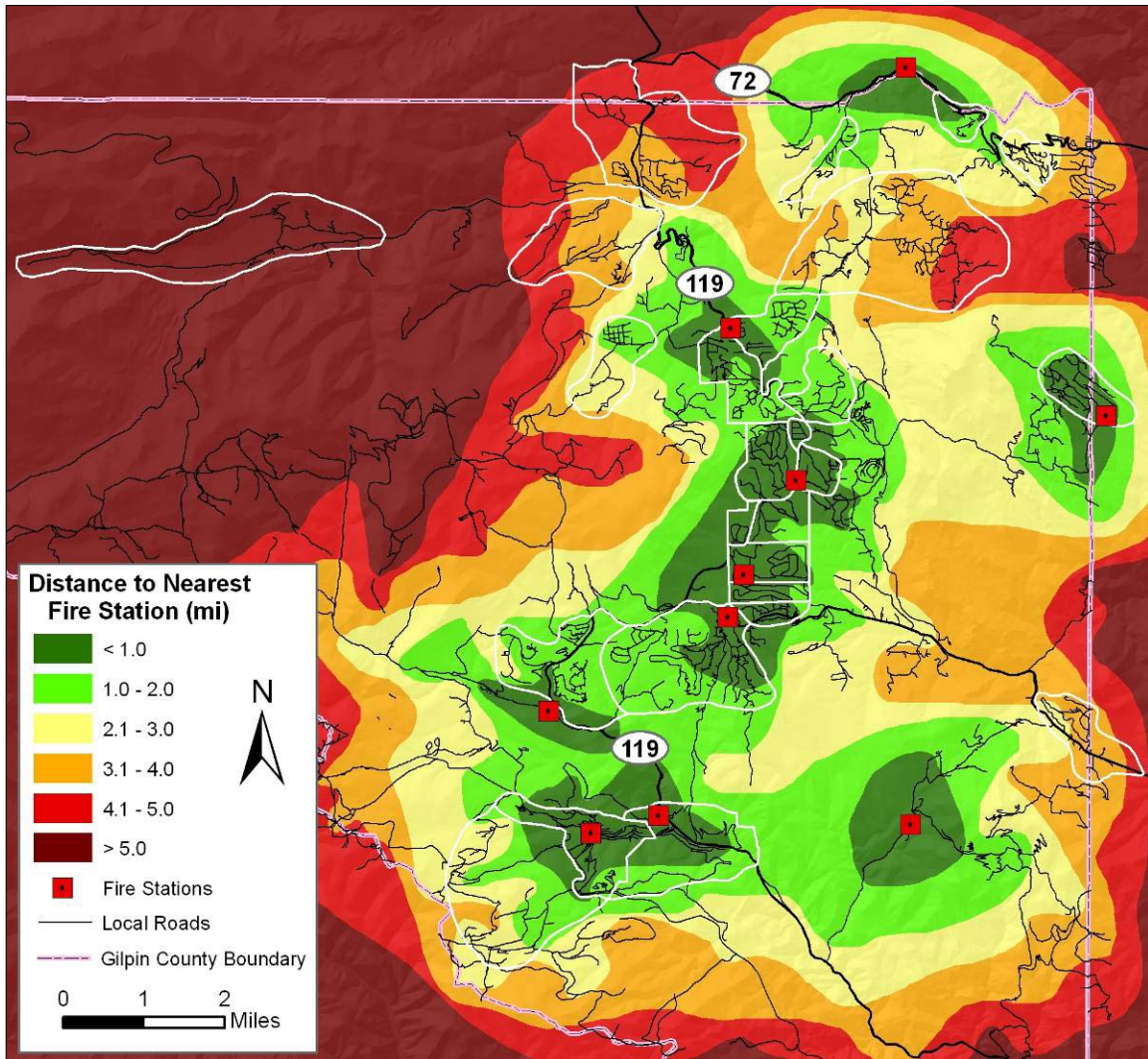




Figure 15. Gilpin County Proximity Map



Distances to the nearest fire stations were calculated in ArcGIS and take into account the road distance to a given area, rather than merely the “flight distance.” This map shows the road distances from the communities to the nearest fire station. The purposes of this analysis is to defining response distance to potential fire ignitions. The distance analysis calculates drivable distance, not drive time. However, the distance is an important factor in rating community hazards. Response times will vary greatly over the same distance due to road conditions, steepness, curvature of roads, and evacuation traffic.

Communities with mean distances greater than four miles from a fire station were given a weighted increase in their hazard rating.

## **BLACK HAWK FIRE DEPARTMENT**

Historically an all-volunteer fire department, the Black Hawk Fire Department has evolved with the changing character of the town following the introduction of limited stakes casino gambling in 1991. Although Black Hawk has only 100 residents, the industry of gaming causes the daily population to swell up to 50,000. Today the department is a combination of part-time and full-time firefighters and full-time paramedics. The department is run out of one station with four pieces of fire apparatus, and is staffed 24 hours a day, seven days a week with 22 career firefighters, including three captains, three lieutenants, 15 firefighters, six reserve firefighters, and six Gilpin Ambulance, Inc. paramedics. Two paramedics are assigned to each shift.

### **Emergency Water Resources**

Emergency water is supplied to the Black Hawk Fire District through a pressurized hydrant grid system.

## **BLACK HAWK FIRE DEPARTMENT RECOMMENDATIONS**

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### **Firefighter training**

- Structural training to accommodate high rise incident medical and structural fire scenarios.
- Emergency Medical Technician medical training for all firefighters.
- NWCG S-130/190 for all firefighters.
- Annual wildland refresher NWCG RT-130 and physical for seasonal red card status for all firefighters.
- Additional recommended wildland class for all firefighters include NWCG S-215 Fire Operations in the Urban Interface, S-290 Intermediate Fire Behavior, I-200 and I-300 Basic and Intermediate ICS.
- Encourage Type 3 incident management team participation.
- Encourage personnel to seek higher qualifications and participate in out-of-district fire assignments.
- Encourage training with adjacent districts.

### **Equipment**

- Provide standard “Personal Protective Equipment” known as bunker or turnout gear, in compliance with NFPA 1971 standards for all firefighters.
- Provide standard wildland “Personal Protective Equipment”, in compliance with NFPA 1977 standards for all firefighters.

### **Mutual Aid and agency collaboration**

- In cooperation with Gilpin County Emergency Management, Central City Fire Department, and Timberline Fire Authority, develop an emergency operations plan that provides clear and mutually acceptable protocols concerning out-of-district response areas, incident dispatching, communications, and mutual aid procedures for both in- and out-of-county available resources.
- In collaboration with adjacent agencies, develop a pre-attack or pre-suppression plan that addresses available resources, known hazards, fire management strategies, and evacuation procedures.

### **Public Outreach**

- Develop a community education program that promotes community and commercial awareness of Wildfire facts, hazard reduction opportunities, and emergency procedures in the event of an incident.
- Establish emergency operational procedures, including points of contact with selected commercial entities within the district.

## **CENTRAL CITY FIRE DEPARTMENT**

Central City and the surrounding rural area is served by a volunteer fire department currently staffed with thirteen volunteer firefighters and one paid chief. The department operates out of two stations, one with limited bay capacity in the historic downtown area, and one larger facility outside the city limits shared with Gilpin County administrative offices. Each year, at least seven firefighters attain red card certification and a majority of these have additional NWCG qualifications.

Central City Fire maintains two Type VI brush trucks, one Type I Engine, one Type III Engine, and two incident command vehicles. The department responds to medical, trauma, and fire related dispatches within city limits but also serves the extended rural area to the south, west and northwest of town.

## **EMERGENCY WATER RESOURCES**

The community of Central City is served by a pressurized hydrant grid. One underground private tank is located in Russell Gulch at the storage units, and one is located on Highway 119 mile marker 1.5, at the service station. Other draft sources are located throughout the district on a seasonal basis.

## **CENTRAL CITY FIRE DEPARTMENT RECOMMENDATIONS**

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### **FIREFIGHTER TRAINING**

- Structural training to accommodate residential and commercial incident medical and structural fire scenarios.
- Emergency Medical Technician or First Responder training for all firefighters.
- NWCG S-130/190 for all firefighters.
- Annual wildland refresher NWCG RT-130 and physical for seasonal red card status for all firefighters.
- Additional recommended wildland class for all interested firefighters include NWCG S-215 Fire Operations in the Urban Interface, S-290 Intermediate Fire Behavior, I-200 and I-300 Basic and Intermediate ICS.
- Encourage Type 3 incident management team participation.
- Encourage personnel to seek higher qualifications and participate in out-of-district fire assignments.
- Encourage training with adjacent districts.

## **EQUIPMENT AND RESOURCES**

- Provide standard “Personal Protective Equipment” known as bunker or turnout gear, in compliance with NFPA 1971 standards for all firefighters
- Provide standard wildland “Personal Protective Equipment”, in compliance with NFPA 1977 standards for all firefighters.
- Apparatus recommendations include two additional tenders and one additional Type III wildland truck.
- With residential development increasing west of town and south of town, additional emergency water supply resources are recommended. These can vary in size depending on the scope of the development. Funding, may be derived, in part, through the building permitting process. Specific locations should be determined through a potential tactical scenario analysis as well as a study of available locations.

## **MUTUAL AID AND AGENCY COLLABORATION**

- Coordinate with Gilpin County Emergency Management, Black Hawk Fire Department, and Timberline Fire Authority, to develop an emergency operations plan that provides clear and mutually acceptable protocols concerning out-of district response areas, incident dispatching, communications, and mutual aid procedures for both in and out of county available resources.
- Develop a pre-attack or pre-suppression plan, in collaboration with adjacent agencies that addresses available resources, known hazards, fire management strategies, and evacuation procedures.

## **PUBLIC OUTREACH**

- Develop a community education program that promotes community and commercial awareness of Wildfire facts, hazard reduction opportunities, and emergency procedures in the event of an incident.
- Establish emergency operational procedures, including points of contact with selected commercial entities within the district.

## TIMBERLINE FIRE AUTHORITY

The creation of the Timberline Fire Authority was initiated last year through the merger of the Colorado Sierra and High Country Fire Protection Districts. This new fire authority consolidates resources of the two districts and simplifies incident dispatching within the adjacent response areas. Formal consolidation of the two districts is still pending (projected 2009); therefore, this resource analysis is based on input from the original Colorado Sierra fire protection districts and does not reflect a consolidated inventory.

## HIGH COUNTRY FIRE PROTECTION DISTRICT

High County Fire Protection District operates out of five stations in Gilpin and Boulder Counties. The department is staffed by 39 volunteer firefighters. Current qualification status of personnel was not provided. Apparatus inventory includes:

**Table 13. High Country Fire Protection District Apparatus Inventory**

Type	Tank Capacity in Gallons	Current Station Location
Brush Truck	400	1
Engine/Tender	1200	1
Tender	1250	1
Brush Truck	220	2
Tender / Pumper	1600	2
Rescue	n/a	2
Squad / Pumper	n/a	2
Brush truck	220	3
Engine / Tender	1250	3
Tender	1250	3
Brush truck	Unknown	4
Engine	500	4
Tender	1250	4
Engine	500	5
Tender	1000	5

## EMERGENCY WATER RESOURCES

Emergency water supplies in the High County Fire Protection District are primarily static sources such as cisterns and draft sites that access ponds, lakes or creeks. No further information was provided. It is recommended that a table similar to **Table 15** on page 53 be generated for this area (formerly High Country district area).

## **COLORADO SIERRA FIRE PROTECTION DISTRICT**

Colorado Sierra operates out of two stations and is staffed by 14 volunteer firefighters. All firefighters have NWCG S-130/190 Basic wildland firefighter and fire behavior training. Of these, about 50% maintain active red card status and nearly 75% have additional advanced NWCG qualifications. Apparatus inventory includes:

**Table 14. Colorado Sierra FPD Apparatus Inventory**

Type	Tank Capacity in Gallons	Current Station Location
Engine	Type VI	1
Rescue	Type VI	1
Tender	Unknown	2

## **EMERGENCY WATER RESOURCES**

The table on the next page shows the results of a water supply survey conducted in 2005 as a part of the Colorado Sierra CWPP.

**Table 15. Colorado Sierra Water Supplies**

Colorado Sierra Water Supplies						
Map ID	Water Source Name	Type	Delivery	Latitude	Longitude	Volume (in gals.)
A	Taggerts	Hydrant	Draft	39 51.902	105 27.887	10,000
B	Premier Realty	Tank	Draft	39 51.915	105 27.963	10,000
C	CO Natural Gas	Tank	Draft	39 51.928	105 27.942	10,000
D	Sierra Pond	Pond/Lake	Draft	39 52.230	105 28.280	.23 acre 8' deep
E	1600 Karlann Dr.	Tank	Draft	39 52.185	105 28.540	10,000
F	Sierra Delta - 9 Caesar Rd.	Tank	Draft	39 51.203	105 28.818	10,000
G	Dory Pond #1	Pond/Lake	Draft	39 51.858	105 28.667	Unknown
H	CSFPD Station #2	Tank	Other	39 50.850	105 28.615	1,000
I	Dory Pond #3	Pond/Lake	Draft	39 50.733	105 27.815	Unknown
J	CDOT Facility (under constr.)	Tank	Draft	39 51.947	105 27.902	30,000
K	Mountain Man Auto	Tank	Draft	39 52.053	105 27.840	20,000
L	Black Hawk Storage Sheds	Tank	Draft	39 51.987	105 27.890	10,000
M	Renaissance Solutions	Tank	Draft	39 52.52	105 27.958	10,000
N	Grapes (D & J Excavating)	Tank	Draft	39 52.237	105 27.848	10,000
O	Gilpin County Library	Tank	Draft	39 52.318	105 27.858	10,000
P	Braecher Meadow Lakes (mile marker 14.5 Hwy. 119)	Pond/Lake	Draft	39 51.491	105 27.017	Unknown
Q	CSFPD Station #1	Tank	Other	39 51.878	105 27.919	10,000
R	Big Lake in Dory Lakes	Pond/Lake	Draft	39 50.987	105 28.452	Unknown
S	Small Private Pond (Highpoint Circle)	Pond/Lake	Draft	39 50.575	105 28.550	Unknown



## **TIMBERLINE FIRE AUTHORITY RECOMMENDATIONS**

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### **FIRE AUTHORITY CONSOLIDATION**

- Finalize district merger
- Inventory combined resources, equipment, apparatus, and personnel qualifications including structural, medical, and wildland.
- Review and update mutual aid agreements as necessary

### **FIREFIGHTER TRAINING**

- Establish structural and medical training requirements to meet district needs.
- NWCG S-130/190 for all firefighters.
- Annual wildland refresher NWCG RT-130 and physical for seasonal red card status for all firefighters.
- Additional recommended wildland class for all interested firefighters include NWCG S-215 Fire Operations in the Urban Interface, S-290 Intermediate Fire Behavior, I-200 and I-300 Basic and Intermediate ICS.
- Encourage Type 3 incident management team participation.
- Encourage personnel to seek higher qualifications and participate in out-of-district fire assignments.
- Encourage training with adjacent districts.

### **EQUIPMENT AND RESOURCES**

- Provide standard “Personal Protective Equipment” known as bunker or turnout gear, in compliance with NFPA 1971 standards for all firefighters
- Provide standard wildland “Personal Protective Equipment”, in compliance with NFPA 1977 standards for all firefighters.
- An additional tender is recommended to be positioned in the Colorado Sierra subdivision area.
- Following consolidation, a strategic water resource analysis should be conducted. All subdivisions found to be lacking a local emergency water source should be considered for installation of at least one 30,000 gallon cistern, preferably located at an accessible area near the intersection of the subdivision entrance and the main access road.
- Any dry and municipal hydrants in the district should be inspected and serviced on an annual basis.
- Apparatus should be equipped with portable water storage, porta-tanks, or pumpkins.

## **MUTUAL AID AND AGENCY COLLABORATION**

- Coordinate with Gilpin County Emergency Management, Black Hawk Fire Department, Central City Fire Department, and other adjacent fire districts, to develop an emergency operations plan that provides clear and mutually acceptable protocols concerning out-of district response areas, incident dispatching, communications, and mutual aid procedures for both in and out of county available resources.
- Develop a pre-attack or pre-suppression plan, in collaboration with adjacent agencies that addresses available resources, known hazards, fire management strategies, and evacuation procedures.

## **PUBLIC OUTREACH**

- Develop a community education program that promotes and supports awareness of wildfire facts, hazard reduction opportunities, and emergency procedures at the neighborhood
- Initiate a recruitment program within the district.

# FUNDING AND GRANTS

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This section provides information that may be helpful in planning and preparing for fuels mitigation projects. Grant funding support is often a necessary component of a fuels treatment project and can facilitate fuel reduction on both private and public lands. Guidance on the application process and updated information on grant availability is available through the CSFS.

## **CSFS Eligible Landowner Assistance Programs and Contingencies**

For the funding opportunities listed below, the following stipulations apply:

- Landowners apply through CSFS district offices unless otherwise noted below
- Applications approved when funds are available throughout the year
- Matching expenses or in-kind activities by landowner are generally required
- Grant availability is subject to continued funding from federal and state government

## **Funding Opportunities**

1. **WUI Incentives:** Wildland-Urban Interface for fuels reduction
2. **I & D Prevention and Suppression:** Bark Beetle; Forest Health
3. **FRFTP:** Front Range Fuels Treatment Partnership for fuels reduction
4. **STEVENS:** Stevens or “companion” funds for fuels reduction projects on non-federal lands that may be threatened by burning on US Forest Service lands (these funds may be “no-match” in some cases)

## **CSFS Assistance Programs – Communities and Agencies**

For the funding opportunities listed below, the following stipulations apply:

- Cooperators, communities, organizations and agencies apply through CSFS district offices
- Applications received and approved during the identified funding window
- Matching expenses or in-kind activities by applicants are generally required
- Grant availability is subject to continued funding from federal and state government
- Applications for activities listed in current CWPPs are normally ranked highest for funding consideration

## Funding Opportunities

1. **WUI Incentives:** Wildland-Urban Interface for fuels reduction. Application period is August for grants awarded the following May. Grants are usually for a one-year period ending September 30<sup>th</sup> the year following the award.
2. **CWPP Implementation (CSFS/SFA):** Application period is January or May for grants awarded that year. Normally, grants must be completed by September 30<sup>th</sup> of the awarded year.
3. **Colorado Community Forest Restoration (HB 07-1130):** Application period is July-August for grants awarded that year. Normally, grants are for a two-year period ending June 30<sup>th</sup> of the second year following award. Subject to continued funding through Colorado Legislature.
4. **FRFTP – Front Range Fuels Treatment Partnership** for fuels reduction: Application period is January or May for grant awarded that year. Normally, grants must be completed within one to two years of the award date.
5. **STEVENS:** Stevens or “companion” funds for fuels reduction projects on non-federal lands that may be threatened by burning on US Forest Service lands (these funds may be “no-match” in some cases). Application is January or May for grants awarded that year. Normally, grants must be completed within one to two years of the award date.
6. **I & D Prevention and Suppression – Bark Beetle; Forest Health:** Application period is January or May for grants awarded that year. Normally, grants must be completed within one to two years of the award date.

For additional grants and grant application assistance, visit the Rocky Mountain Wildland Fire Information Grant Database: <http://www.rockymountainwildlandfire.info/grants.htm>

Grant writing handbook: <http://www.theideabank.com/freeguid.html>