**Declaration of Agreement and Concurrence**

_____, _____ Cascade Volunteer Fire Department
Name Title

_____, _____ Green Mountain Falls/Chipita Park
Name Title Volunteer Fire Department

_____, _____ Colorado Springs Utilities
Name Title

_____, _____ El Paso County, Board of County
Name Title Commissioners

_____, _____ Colorado State Forest Service
Name Title

_____, _____ USDA, District Fire Management
Name Title

_____, _____ Green Mountain Falls, Official
Name Title

_____, _____ Author/Writer/Co-Chair
Name Title

_____, _____ Author/Writer/Co-Chair
Name Title

Date of full concurrence:_____

# Ute Pass Community Wildfire Protection Plan
# Cascade Volunteer Fire Department & Green Mountain Falls/Chipita Park Volunteer Fire Department – Colorado

## August, 2007

Moving up the tree line on Pikes Peak Highway. Pikes Peak towers behind the low hanging-clouds. Photo by KRB

*Co-Chairs, Writing, and Editing: Kathrine & Randall Backe*
*Contributors: Cascade/Chipita Park/ & Green Mountain Falls/Chipita Park Volunteer Fire Departments, Colorado State Forest Service, United States Forest Service, El Paso County Environmental Services, Southern Rockies Conservation Alliance, Chipita Park Association Members, Cascade Community Resorts, Inc., Pikes Peak Mountain Estates, Green Mountain Falls Officials, Colorado Springs Utilities, Residents of the Cascade, Chipita Park, & Green Mountain Falls communities serving on the Committee.*

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## DEFINITIONS / GLOSSARY OF TERMS

**Age Class** – A classification of trees of a certain range of ages.

**Aspect** – The direction in which any piece of land faces.

**Biological Diversity** – The variety of living organisms considered at all levels of organization, including the genetic, species, and higher taxonomic levels, and the variety of habitats and ecosystems, as well as the processes occurring therein.

**Bole** – The main stem or trunk of a tree.

**Canopy** – The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand. Where significant height differences occur between trees within a stand, formation of a multiple canopy (multi-layered) condition can result.

**Citizen Safety Zone** – An area that can be used for protection by residents, and their vehicles, in the event that the main evacuation route is compromised. The area should be maintained, clear of fuels and large enough for all residents of the area to survive an advancing wildfire without special equipment or training.

**Coarse Woody Material** – Portion of tree that has fallen or been cut and left in the woods. Pieces are at least 16 inches in diameter (small end) and at least 16 feet long.

**Cohort** – A group of trees developing after a single disturbance, commonly consisting of trees of similar age, although it can include a considerable range of tree ages of seedling or sprout origin and trees that predate the disturbance.

**Community Assessment** – An analysis designed to identify factors that increase the potential and/or severity of undesirable fire outcomes in WUI communities.

**Crown Class** – A class of tree based on crown position relative to the crowns of adjacent trees.

**Crown Fire** – Fire that advances through the tops of the trees.

**Defensible Fuel Reduction Zones** – Areas of modified and reduced fuels that extend beyond fuel breaks to include a larger area of decreased fuels. These would include managed stands with reduced amounts, continuities, and/or distributions of fuels that would provide additional zones of opportunity for controlling wildfire.

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

**Density Management** – Cutting of trees for a variety of purposes including, but not limited to: accelerating tree growth, improved forest health, to open the forest canopy, promotion of wildlife and/or to accelerate the attainment of old growth characteristics if maintenance or restoration of biological diversity is the objective.

**Dominant** – Crowns extend above the general level of crown cover of others of the same stratum and are not physically restricted from above, although possibly somewhat crowded by other trees on the sides.

**Co-Dominant** – Crowns form a general level of crown stratum and are not physically restricted from above, but are more or less crowded by other trees from the sides.

**Down, Dead Woody Fuels** – Dead twigs, branches, stems, and boles of trees and shrubs that have fallen and lie on or near the ground.

**Extended Defensible Space** – A defensible space area where treatment is continued beyond the minimum boundary. This zone focuses on forest management with fuels reduction being a secondary consideration.

**Fire Behavior Potential** – The expected severity of a wildland fire expressed as the rate of spread, the level of crown fire activity, and flame length. Derived from fire behavior modeling programs utilizing the following inputs: fuels, canopy cover, historical weather averages, elevation, slope, and aspect.

**Fire Hazard** – The likelihood and severity of Fire Outcomes (Fire Effects) that result in damage to people, property, and/or the environment. Derived from the Community Assessment and the Fire Behavior Potential.

**Fire Mitigation** – Any action designed to decrease the likelihood of an ignition, reduce Fire Behavior Potential, or to protect property from the impact of undesirable Fire Outcomes.

**Fire Outcomes (Fire Effects)** – A description of the expected effects of a wildfire on people, property, and/or environment based on the Fire Behavior Potential and physical presence of Values-At-Risk. Outcomes can be desirable as well as undesirable.

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

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

**Hazard** – The combination of the wildfire hazard ratings of the WUI communities and the fire behavior potential as modeled from the fuels, weather, and topography of the study area.

**Intermediate** – Trees are shorter, but their crowns extend into the general level of dominant and co-dominant trees, free from physical restrictions from above, but quite crowded from the sides.

**Risk** – The likelihood of an ignition occurrence that results in a significant fire event.

**Shelter-In-Place** – A method of protecting the public from an advancing wildfire involving instructing people to remain inside their homes or public buildings until the danger passes. This concept is a dominant modality for public protection from wildfires in Australia where fast moving, short duration fires in light fuels make evacuation impractical. The success of this tactic depends on a detailed preplan that takes into account the construction type and materials of the

building used, topography, depth and type of the fuel profile, as well as current and expected weather and fire behavior.

**Suppressed** – Also known as overtopped. Crowns are entirely below the general level of dominant and co-dominant trees and are physically restricted from immediately above.

**Values-At-Risk** – People, property, and environmental features within the project area which are susceptible to damage from undesirable fire outcomes.

# I. Introduction to the Ute Pass CWPP

Wildland fires along Colorado's southern Front Range have been occurring for millennia, diversifying vegetation and wildlife, bringing nutrients to the soil, and changing the landscape. Fires are an essential part of the natural process. With the development of human communities in and near forested landscapes, however, wildfires can also destroy homes, damage property, and even pose a threat to human life. Ironically, the success of fire suppression during the twentieth century has made the forest management situation even more difficult because many forested stands have become significantly denser than they were early in the past century (see Historical section of this document). Although federal, state, and county forestry agencies, as well as local fire districts and many communities have been aware of these challenges for some time, the catastrophic wildfires along the Front Range in 2002 gave many others a wake-up call.

The Healthy Forests Restoration Act (HFRA) of 2003 emphasizes the role of community planning and offers a variety of benefits to communities with a Community Wildfire Protection Plan (CWPP) in place. Groups such as the Front Range Fuels Treatment Partnership (see their 2004 Annual Report) took the lead in working with communities to develop and implement CWPPs.

Local community leaders should develop CWPPs with support from local, state, and federal agencies, as well as non-governmental stakeholders. A CWPP should take the form of a written, agreed upon document that identifies how a community will reduce its risk from wildland fire.

The HFRA of 2003 establishes incentives for communities to develop CWPPs, as federal matching grants for fuel reduction and related projects become available once a CWPP is either finalized or well along in development. A CWPP requires approval by local government, the local fire authority, and the state forest management agency, in this case the Colorado State Forest Service. It also must be developed in consultation with the federal agency managing the land surrounding the at-risk communities, in this case the USDA Forest Service.

The impetus for a local Ute Pass CWPP originated at a special meeting of the Chipita Park Association on September 22, 2006. Although the idea of developing a local CWPP originated with the Chipita Park Association, the actual planning was a collaborative effort by the Ute Pass communities of Cascade, Chipita Park, and Green Mountain Falls. Planning meetings began in October 2006 and were held regularly, on an approximate monthly basis through August 2007.

The planning process followed the guidelines suggested by the handbook, *Preparing a Community Wildfire Protection Plan (March 2004),* sponsored by the following organizations: Communities Committee, National Association of Counties, National Association of State Foresters, Society of American Foresters, and Western Governors' Association. Using these guidelines, the following steps were implemented:

1. Establish and convene a core committee of local leaders and decision makers.
2. Involve county, state, and federal forestry agencies.
3. Contact and seek involvement from local stakeholders.
4. Establish boundary maps for the CWPP.
5. Conduct a community wildfire risk assessment.
6. Identify fuels treatment priorities and fire mitigation recommendations.
7. Develop an implementation plan and assessment strategies to monitor progress and update the plan periodically.
8. Finalize the CWPP and share it with the communities.

Special thanks are due the Ute Pass CWPP Committee members for their active roles and contributions of time and effort to this plan. A complete listing of the committee is provided in the next section of this document.

Steps 1 and 2 in the development of the CWPP began with the first meeting of the planning committee on October 16, 2006. This kick-off meeting included representatives from the Chipita Park Association, Cascade Resort Communities, El Paso County, the Colorado State Forest Service, and the USDA Forest Service. A concerted effort was made to involve representatives of all required groups, as well as other resource and community groups, at all meetings that followed. We addressed a meeting of the Cascade Fire Protection Board on December 4, 2006 and also a meeting of the Cascade/Chipita Park Volunteer Fire Department on December 5, 2006, explaining the purpose for developing a CWPP, and asking for their involvement and support. In addition, a special meeting was held January 3, 2007 to involve and update the local fire districts.

Step 3, engaging interested parties, was addressed through our Chipita Park Association newsletter, and by posting notices at the Green Mountain Falls and Cascade Post Offices, the local library, the Cascade/Chipita Park Fire Hall, and a local café. An informational news release about our planning was published in the *Pikes Peak Courier View* (Woodland Park) newspaper, and in a newsletter, *The Cascade Echo,* published by the Cascade Women's Club. We also held a free informational fair and pancake breakfast for approximately 120 guests at Marcroft Hall in Chipita Park on June 16, 2007. Additional efforts to engage local residents have included public monthly meetings, with phone and email notification. Attendance at the monthly CWPP meetings usually averaged 15 - 20 individuals, including county, state, and federal agency personnel.

Steps 4–8 of the planning process were carried out during the monthly meetings held during 2007. The information gathered, along with a detailed analysis of these steps, is provided in the remainder of this document.

## II. Historical Dimensions of Wildfire and Forest Cover in Ute Pass

### A. Early History

Long before the first White settlers, the Ute Indians used Ute Pass as their primary route from the mountains to the plains. The gold rush of 1858 brought thousands of fortune seekers through the pass to the South Park area. In 1872, a wagon road was built through the pass, following Fountain Creek. Later, the Colorado Midland Railway followed Fountain Creek up the pass and reached the town of Divide in 1887. The wagon road was improved several times, and during World War I, the route was designated as the Pikes Peak portion of the Ocean-to-Ocean Highway—the fastest route from Washington, D.C. to San Francisco (Pettit, 1979).

The early fire history of the Ute Pass area is sketchy at best. In reviewing the literature, little more than anecdotal information is available, although it is obvious from photographs taken in the late nineteenth and early twentieth centuries that the density of forest cover was much less at that time than it is today. Early records indicate that extensive logging in the area, rather than fires, was responsible for much of the sparse forest cover visible in those photographs. Nevertheless, there is some indication of fires.


Green Mountain Falls view from the West entrance c. 1890. Wellington photo, courtesy of Ute Pass Historical Society.

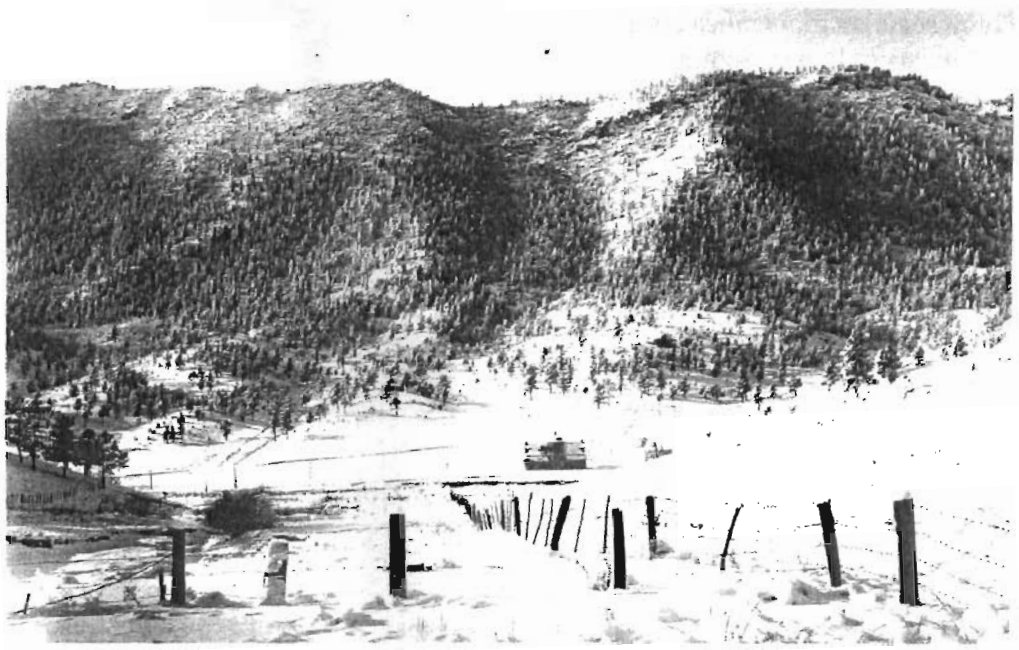
Herbert M. Sommers chronicled one of the earliest written accounts of a large fire in the area. His manuscript, *The Story of the Big Burn of 1853-1854* (1965), indicates that it likely was the largest fire in Colorado during the nineteenth and twentieth centuries. His description, much of it told to him by a Cherokee Indian known as Who You, refers to the burn as extending some 70 miles long, and burning for three weeks. Much of Sommers' description also relies on his observations

of burn scars on mountainsides as visible from certain areas in Colorado Springs and in Ute Pass. The fire, according to Sommers, apparently started at a point near Fort Carson, ascended South and North Cheyenne Canyons, and burned "the heavy timber on Cheyenne Mountain." It burned in front of a hard wind from the southeast, and was pulled up Ute Pass, "acting as a giant flue." Many of the north and northwest faces of the mountains and gulches were jumped and those areas of virgin timber still remained after the fire. As it ascended Ute Pass, the fire sometimes cleared all timber on one side, leaving unharmed some on the opposite side. "Such was the case at Cascade and Green Mountain Falls, both of which have virgin timber now in their general area. However, at Chipita Park and Crystola, it is easy to recognize the burned out area—some of which has started to recover or reforest itself with scrub oak, aspen, pines, and spruce." [Note: this quote from Sommers is based on an observation written in 1965.] The fire traveled westward to Divide and on to Lake George, both north and south of the present U.S. Highway 24. Here, according to Sommers, the fire path widened, but remained north of the Platte River Canyon on to the top of Wilkerson Pass, where it finally burned itself out. (Refer to the Forest Reserves map from 1898 at the end of this history section. It shows burned areas, including those from the "big burn," and other fires in the forest reserves, prior to their designation as national forests.)

No records can give the exact year, but the Cherokee Who You's method of travel and contacts with the Pawnees have satisfied Sommers that it occurred in either 1853 or 1854, and most likely in the fall of 1854.

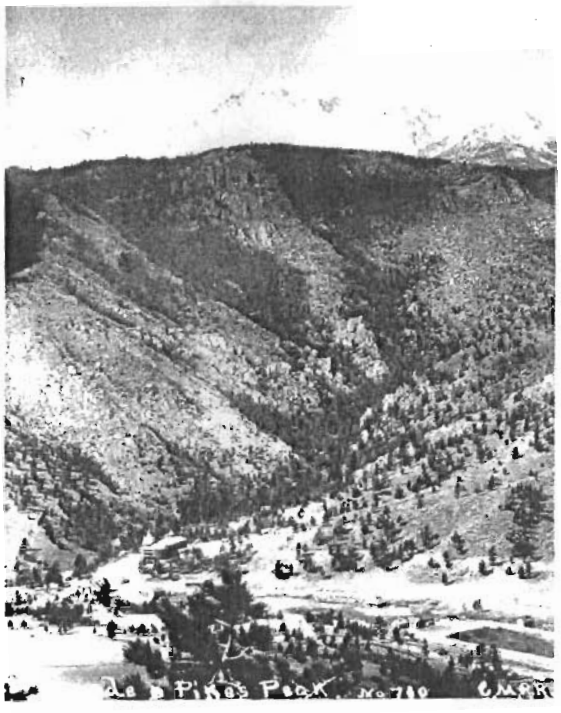
Jan Pettit's excellent *Ute Pass: A Quick History* (1979) gives several references to extensive logging in the Ute Pass area. She mentions an early saw mill operated on the west side of the stream in what was then Ute Park, now known as Chipita Park. She refers to wagonloads of timber hauled from Bald Mountain and Manitou Park, down Wellington Gulch into Ute Park, and on down the pass.

According to Marion Ritchey Vance and John A. Vance, in their "Story Behind Pike National Forest" (2006), at the beginning of the twentieth century, "nearly three quarters of what is now Pike National Forest had been cut over or burned. Unbridled logging cleared the front range of trees from Central City to Cripple Creek; it is said that no timber in Colorado had been so exploited as that of the present Pike where the sawmills ran day and night." Vance and Vance, in relating the history of the Forest, make reference to "the wholesale deforestation, slaughter of wildlife, over-grazed grassland, and damage from forest fire that characterized the area at the time public lands were first set aside as timberland reserves in the 1890s."



Ute Park (now Chipita Park) Railroad Station, facing south, from Wellington Ranch c.1900. Wellington Photo, courtesy of Ute Pass Historical Society.

During the gold rush of the 1890s in the Cripple Creek and Victor District, traffic through the pass boomed, and five saw mills in Woodland Park turned out millions of board feet of spruce and pine lumber.



Cascade with Pikes Peak above and Ramona Hotel below. Ira Rudy photo for Colorado Midland Railroad c. 1890, courtesy of Ute Pass Historical Society.

The rapid growth of mining towns and Front Range cities were insatiable in their demand for lumber, and the railroads needed railroad ties, with some 200,000 being shipped annually from Woodland Park. In addition, the hundreds of mines in the District required shoring timbers. All of these demands for timber products had their impact on the timbered slopes.

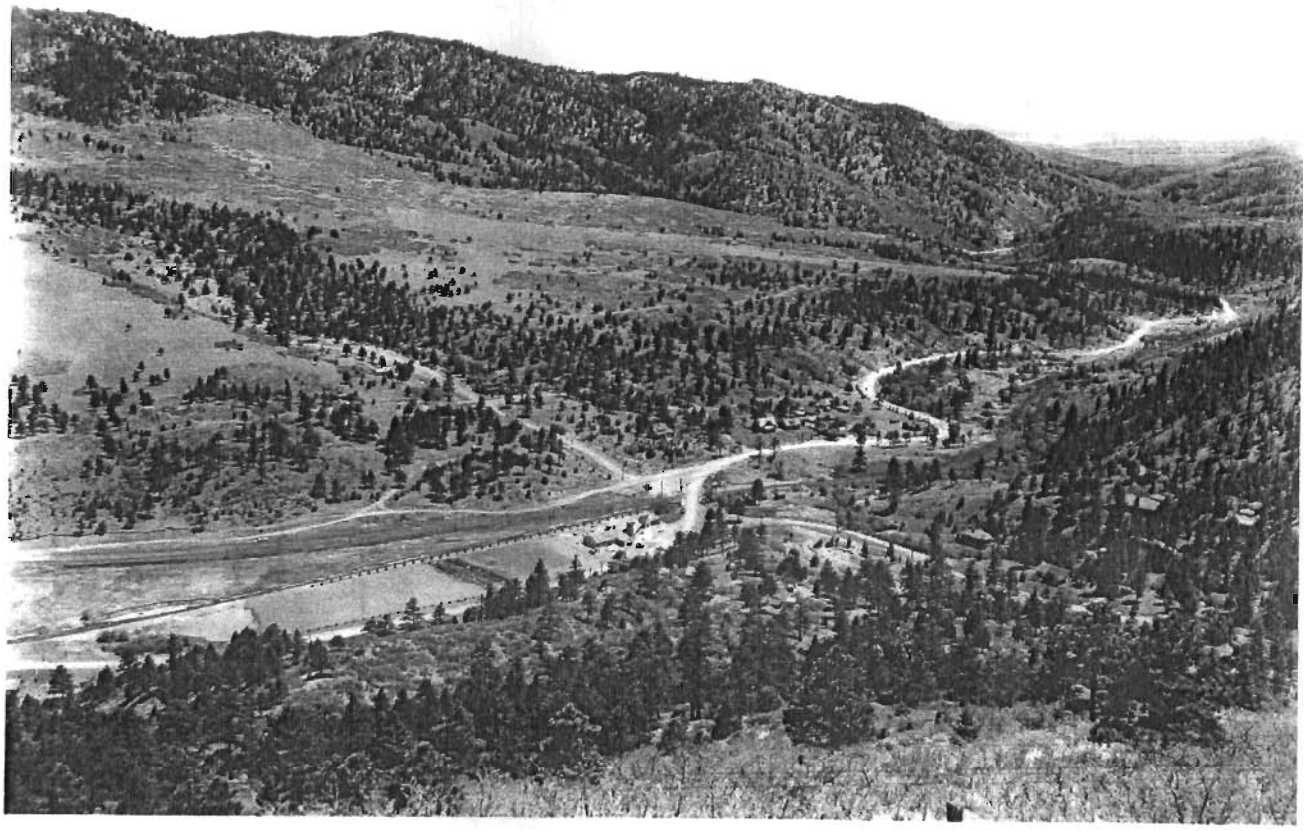
At the end of the nineteenth century, according to Vance and Vance, "half a dozen major forest fires had swept the Pikes Peak area—some caused by lightning, some by human carelessness, and some by way of cover-up for illegal logging operations. With the loss of ground cover, *erosion* became a major problem, and the watershed that served Colorado Springs and other Front Range cities was in jeopardy."

Forest reserves in the area were established by presidential proclamations in 1892. By 1907, these reserves were combined and officially renamed Pike National Forest, which today covers 1.2 million acres. The primary concern for the Pike was to re-create the forest. Vance and Vance point out that "protection of the Front Range watershed was paramount" and it involved quickly re-establishing of ground cover to halt serious erosion. A seedling facility, named the Monument Nursery in 1907, began producing millions of seedlings annually, and by mid-century, more than 40,000 acres of denuded lands had been replanted with blue and Engelmann spruce, Douglas fir, ponderosa, limber, and bristlecone pine.

This photo from around 1920 shows some re-establishment of trees in Green Mountain Falls.

View of Green Mountain Falls Hotel and Lake. Original at Colorado Springs Pioneers Museum, c. 1920. Tent "city" center left. Courtesy of Ute Pass Historical Society.

In the photo below of Cascade, Colorado taken in 1927, it is possible to discern the re-establishment of forest cover on the north-facing slopes (foreground).



Cascade, Colorado, 1927; courtesy of Ute Pass Historical Society. Forest cover is still sparse, even though trees are being re-established.

**B. Recent History**

Although the towns along lower Ute Pass sprang up in the late 1800s as resort destinations for easterners, summer homes were soon established, and in the mid to late twentieth century, the communities evolved to provide year-round residences for people, many of whom commuted to work in Colorado Springs.

The following two photos are recent views of Cascade, the community closest to the eastern boundary of this community wildfire protection plan, as one ascends the pass from Manitou Springs. These views are in stark contrast to the earlier photos, and show how forest cover has increased dramatically since the early twentieth century.

Cascade, Colorado; view looking down Ute Pass from Pikes Peak Highway overlook; July, 2007. Forest cover is more noticeable than in earlier photos. Courtesy of Ute Pass CWPP Committee.

Cascade, Colorado; view toward NE from Pikes Peak Highway overlook; July, 2007. Courtesy of Ute Pass CWPP Committee.

The photo that follows shows the relatively sparse large tree cover on the south-facing slopes of the Rampart Range. Vegetation on these slopes consists mostly of Gambel oak and grasses.

South-facing slopes of the Rampart Range from Chipita Park. Photos courtesy of Ute Pass CWPP Committee, July, 2007.

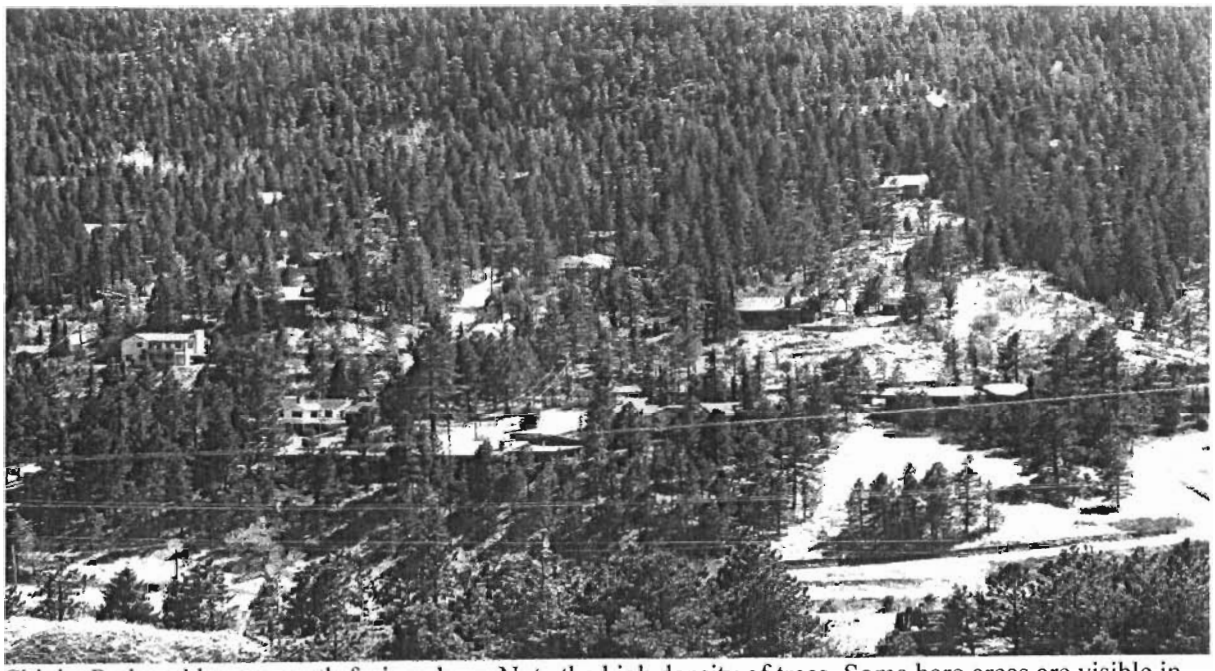
During the twentieth century, tree planting and fire suppression led to growth of *dense* stands of spruce and pine forests, especially on north-facing slopes, which were more protected from the sun and the consequent evaporation of moisture.

Chipita Park view from the north, with Marcroft Hall in center, foreground. Photo courtesy of Ute Pass CWPP Committee, April 2007. Note the density of forest cover.

**Information obtained from Pike National Forest Fire Plan Atlases, courtesy of the U.S. Forest Service (USFS), Pikes Peak Ranger District in Colorado Springs, indicate that no fires in excess of 100 burned acres were recorded in the immediate Ute Pass area during the latter half of the twentieth century. Smaller wildfires, however, have been more common. As an example, between 1955 and 1983, a total of 75 wildfires were recorded within three miles of U.S. Highway 24 between Manitou Springs and Green Mountain Falls. Of these, only three were between 10 and 100 acres, and all others were less than 10 acres in size. Of these, humans caused 46 and lightning caused 29. Since that time, some large (over 100 burned acres) wildfires have occurred in Pike National Forest, but not within three miles of the**

**boundary of our community wildfire protection plan.** Most notable of these were the 820-acre Berry Fire southwest of Monument in April, 1989, and the Hayman Fire, largest wildfire in Colorado history, which burned more than 138,000 acres in June, 2002 (see more details at the bottom of this page).

Vance and Vance (2006) point out "because the Pike borders directly on metropolitan Colorado Springs, it is classed as one of fourteen 'Urban National Forests' in the United States. It is the most heavily used of Colorado's eleven National Forests and may serve as a laboratory for others facing dramatic increase in use." **Along the Front Range and up through Ute Pass, there is no buffer between urbanization and forest habitat. The boundary between developed areas and the forest is referred to as a wildland-urban interface (WUI). More specifically, it is defined as a wild land area within a half-mile of housing with a density greater than one house per 40 acres.** Vance and Vance (2006) suggest, "The addition of dwellings in a flammable forest heightens the risk of conflagration and complicates fire suppression. Firefighting forces must increasingly concentrate on saving structures rather than the surrounding forest."



Chipita Park residences, north-facing slope. Note the high density of trees. Some bare areas are visible in the foreground where beetle-infected trees have been removed. Photo courtesy of Ute Pass CWPP Committee, April, 2007.

**The State of the Rockies Report Card (2007) identified a county-by-county measure of fire risk. "The intersection of WUI areas and high fire risk is one regional measure of fire risk by county (that is, showing where people and fire risk coincide)." By this measure, El Paso County, Colorado ranks as one of the top 10 counties in the Rocky Mountain region for fire risk.**

The largest wildfire in Colorado history occurred during June of 2002. Known as the Hayman Fire, it burned more than 138,000 acres within 20 days, mostly within the boundaries of Pike National Forest, north of U.S. Highway 24. The fire reached to within about 15 miles northwest of Green Mountain Falls, the closest of the Ute Pass communities included in this report. According to the State of the Rockies Report Card (2007), this fire "illustrates the effects of long-term fire exclusion in the Rockies ..."

The USDA Forest Service Rocky Mountain Research Station issued an Interim Fire Case Study Analysis of that fire on November 13, 2002. The report indicated that "extreme environmental

conditions (winds, weather, and fuel moisture) and the large size of the Hayman Fire that developed on June 9, overwhelmed most fuel treatment effects in areas burned ... that day. This includes all treatment methods including prescribed burning and thinning." There were some exceptions, however, including "the Polhemus prescribed burn (2001), the Schoonover wildfire (2002), and the Platte Springs wildfire (2002), that occurred less than one year earlier. These areas did actually stop the fire locally, illustrating that removal of surface fuels alone (irrespective of thinning or changes to canopy fuels) can dramatically alter fire behavior within one year of treatment."

**The case study analysis goes on to note that "in the Colorado Front Range as a whole, twentieth-century fire suppression probably has altered fuel conditions and fire regimes most significantly in low-elevation ponderosa pine forests where fires were relatively frequent prior to the late nineteenth century."**

**An examination of risk assessment tables and descriptions elsewhere in this report reveals that fire risk to cultural/historical sites and ecological features in the Ute Pass communities of Cascade, Chipita Park, and Green Mountain Falls, is predominately medium to extreme.** This corresponds to similar ratings that describe the rate of spread potential for fires in the areas adjoining those communities. (Refer to part IV, Assessing the Risk, in this document.)

View to southwest, with Green Mountain Falls in background. Note that tree density is significantly higher than in the early photos shown in this section. This is due to extensive replanting and fire suppression early in the twentieth century. Photo courtesy of Ute Pass CWPP, April 2007.

The USDA Forest Service Hayman Fire case study also points out that "the size of the fuel treatment unit relative to the size of the wildfire was probably important to the impact on both progress and severity within the treatment unit. Large areas such as the Polhemus prescribed burn (approximately 8,000 acres) were more effective than small fuel breaks (Cheesman Ridge, 51 acres) in changing the fire progress. Under extreme conditions of June 9, spotting easily breached narrow treatments and the rapid movement of the fire circumvented small units."

Also of significance in the case study analysis is the following conclusion: "No fuel treatments were encountered when the fire was small. The fire had time and space to become broad and generate a large convection column before encountering most treatment units. Fuel treatments

may have been more effective in changing fire behavior if they were encountered earlier in the progression of the Hayman Fire before its later phases when mass ignition was possible."

An examination of the economic impacts of the Hayman Fire can provide some insight into the potential impacts on Ute Pass infrastructures, should a similar catastrophic fire occur within the Ute Pass area and the Colorado Springs watershed section of Pike National Forest.

To determine the potential economic impact of destruction by fire in this particular section of the study area, we look to the Hayman Fire Case Study, Technical Report RMRS-GTR-114, as published by the USDA Forest Service in September 2003.

Many aspects of this larger burn area are consistent with the Ute Pass study area, including the following: the inclusion of a large water-supply watershed, the existence of important recreational facilities, the topography and lack of road access into the area, and the overlap of many different organizational entities as pertains to control/maintenance of the land. Differences in the two areas can be justified by offsetting factors, and although the timber resources in our study area may be less than that of the Hayman Burn area, the average terrain in our study area is even more rugged than the general terrain of the Hayman study.

The chart below provides a comparison of the economic costs of the Hayman Fire and projected costs of a similar fire in the Ute Pass area.

**Economic Impact of Catastrophic Fire in the Ute Pass Area and Colorado Springs Watershed Section of Pike National Forest**

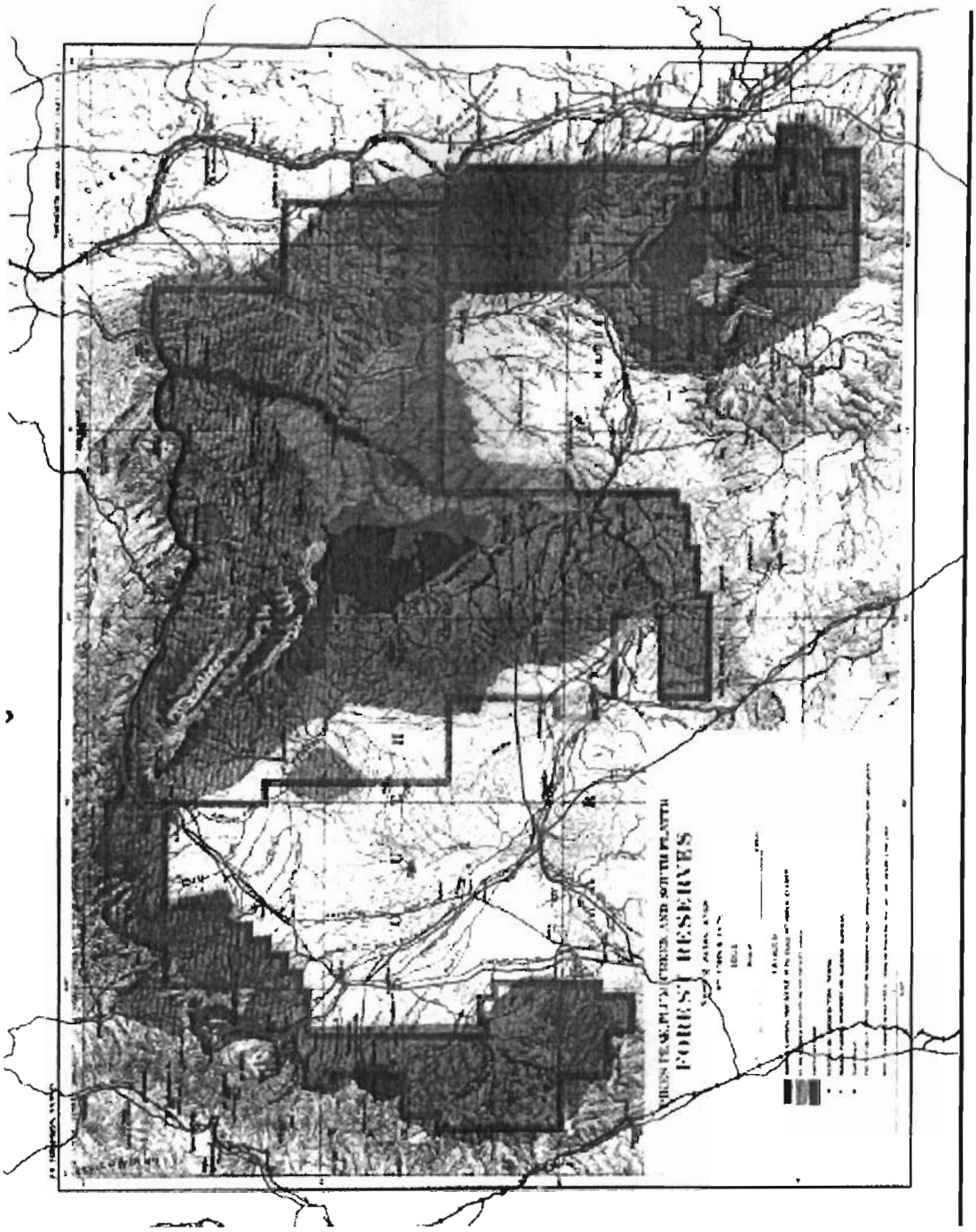
| | **Hayman Fire - 138,000 acres** | ***Ute Pass - Pikes Peak section - 33,000 acres** |
|---|---|---|
| **Fire Fighting/Suppression Costs** | **Millions of Dollars** | **Millions of Dollars** |
| Suppression – USDA Forest Service, other state and Fed agencies | 42.0 | 10.0 |
| Add'l expenses associated with fire-fighting and community support - FEMA, State, American Red Cross | 2.0 | 0.5 |
| Land rehabilitation and restoration | 74.0 | 17.7 |
| **Direct Losses** | | |
| Total insured property losses | 38.7 | 240.0 |
| Loans for uninsured losses - SBA and FEMA | 4.9 | 1.2 |
| transmission lines | 0.9 | 0.2 |
| **Related losses** | | |
| tourism effects - business income loss | 0.4 | 4.4 |
| water storage capacity damage | 37.0 | 8.8 |
| timber loss | 34.0 | 8.1 |
| **TOTAL** | **233.9** | **290.9** |

***These are potential *initial impact* estimated costs based on acreage comparisons and in no way reflect actual costs which would be much more extensive and require further research in the Pikes Peak region.**

The State of the Rockies Report Card (2007) also suggests that, "in addition to large forest fires, insect and disease infestations represent a second key factor affecting forest health. These infestations also exacerbate fire risk by killing mature overstory trees, providing readily burnable fuel for extensive canopy fires." Specific infestations affecting forest health in the Ute Pass area include the mountain pine beetle and the ips beetle.

A section of forest showing beetle-killed trees that demonstrates the impact of the beetle infestation. This view is of the north-facing slope from US Highway 24 at the west Green Mountain Falls exit. Photo courtesy of Ute Pass CWPP Committee, July, 2007.

According to the *2006 Report on the Health of Colorado's Forests* (Colorado State Forest Service), mountain pine beetles "are the most aggressive insect affecting mature pines in western North America." The current mountain pine beetle epidemic began in Colorado's high country in the mid-1990s. The drought of 2000-2004 "enabled beetle populations to rapidly expand in both infested and new areas. There is concern that the vast populations of mountain pine beetle will spread from north-central Colorado to the Front Range. Overcrowded Front Range forests are indeed in the early stages of a slower-growing mountain pine beetle epidemic ..." The report also points out that beetle attacks are a significant cause of fuel buildup. "After 10 or 15 years, beetle-killed trees will fall and can burn very intensely."




Forest Reserves map from 1898. It shows burned areas, including those from the "big burn," and other fires in the forest reserves, prior to their designation as national forests. Note the modern highways, shown in red, that have been superimposed on this map.

**Legend**

Green — Timber showing very little or no trace of fires
Lt. Brown — Much burned over by old or recent fires
Dk. Brown — Badly burned

## III. Goals and Committee Membership

### A. Goals of the CWPP

The Ute Pass CWPP has identified six major goals that guided development of the plan. These goals were first drafted and discussed in smaller working groups before being modified and agreed upon by the larger committee during the February 2007 meeting. Care was taken in drafting the goals to meet the criteria of the HFRA.

**Ute Pass CWPP Goals**

The following goals served as a framework for the planning process:

- To inform residents and involve them in the process/goals of the Ute Pass Community Wildfire Protection Plan (CWPP)
- To reduce hazardous fuels through
  - Mitigation efforts with all stakeholders
  - Promote forest health (i.e. – mountain pine beetle trees and other diseases)
- Complete a risk assessment for Ute Pass CWPP area
- Support firewise techniques in the creation and maintenance of defensible property for all stakeholders
- Enhance fire response capabilities
- Develop recommendations to
  - Attract funding for implementation plans
  - Include specific recommendations for implementation in Sections 1—4 of the mapped area when considering the plan as it pertains to the risk assessment
- Implement a monitoring system as the plan progresses

### B. Membership

On the following page is a list of committee members who were involved in the development of this CWPP.

**Ute Pass Community Wildfire Protection Plan**
**Committee Members - 2006-2007**

| | |
|---|---|
| Anderson, P.J. | Cascade Communities Resort, Inc. |
| Alexander, Mike | United States Forest Service |
| Ayotte, Robert | United States Forest Service |
| Backe, Kathrine & Randall **(Co-Chairs)** | Chipita Park Association |
| Barnes, John | Cascade Volunteer Fire Department |
| Barter, Tom | United States Forest Service |
| Bowman, Rich | Green Mountain Falls/Chipita Park Volunteer Fire Department |
| Buser, Chad | United States Forest Service |
| Chapman, Carla | Columbine Canyon Homeowner's Assn. |
| Chapman, John | Southern Rockies Conservation Alliance |
| Cleek, Tom | Pikes Peak Mountain Estates |
| Ecklund, Vic | Chief Forester, Colorado Springs Utilities |
| Florence, Gary | Green Mountain Falls/Chipita Park Volunteer Fire Department |
| Frandena, Chris | Town of Green Mountain Falls |
| Hudson, Tom | United States Forest Service |
| Johnston, Mark | El Paso County Environmental Services |
| Kreuzer, Bud | Cascade Volunteer Fire Department |
| McAllister, Newman | Chipita Park Association |
| Murphy, Steve | Green Mountain Falls/Chipita Park Volunteer Fire Department |
| Marcus, Naomi | Colorado State Forest Service/Colorado Springs Utilities Watershed Project |
| Root, Dave | Colorado State Forest Service |
| Payne, Robert | Chipita Park Association |
| Sanchez, Dawn | United States Forest Service |
| Seachris, Bruce | Fire Chief, Cascade/Chipita Park Fire Dist. |
| Selk, David & Marlyne | Residents/Chipita Park |
| Spaulding, Steve | Cascade/Forest Consultant |
| Stevens, Tyler | Mayor, Green Mountain Falls |
| Stewart, Bert L. | Chipita Park Association |
| Toth, Richard | Chipita Park Association |
| Valladares, Janelle | United States Forest Service |
| Whittemore, Mike | Cascade Volunteer Fire Department |
| Will, Jinnie | Chipita Park/B & B Forest Consulting |
| Woodrich, Dave | Green Mountain Falls/Chipita Park Volunteer Fire Department |
| Worthey, Marshall | Green Mountain Falls Trustee |

Although not all members attended every meeting, we had on the average, fifteen to twenty people in attendance. Meetings held from September, 2006 – August, 2007.

# IV. Wildland-Urban Interface Description

## A. Boundaries

Considerable discussion took place during CWPP committee meetings early in 2007 concerning what would constitute the boundaries of the Ute Pass CWPP. The boundaries were finalized in March of 2007. The boundary serves as the wildland urban interface (WUI) boundary of the plan. (Refer to the Ute Pass CWPP Boundaries map included in this section.) The populated areas include, but are not limited to, the communities of Cascade, Chipita Park, and Green Mountain Falls. (Refer to Land Ownership map). On the boundary map, the boundary is indicated in orange, whereas the blue lines delineate the two fire districts included.

The CWPP Boundaries map is divided into four sections by a vertical and a horizontal line. Section 1 is the northwest section, Section 2 the northeast section, Section 3 the southwest section, and Section 4 the southeast section. References are made to these Section numbers in the risk assessment narrative (Assessing the Risk) in part IV of this document.

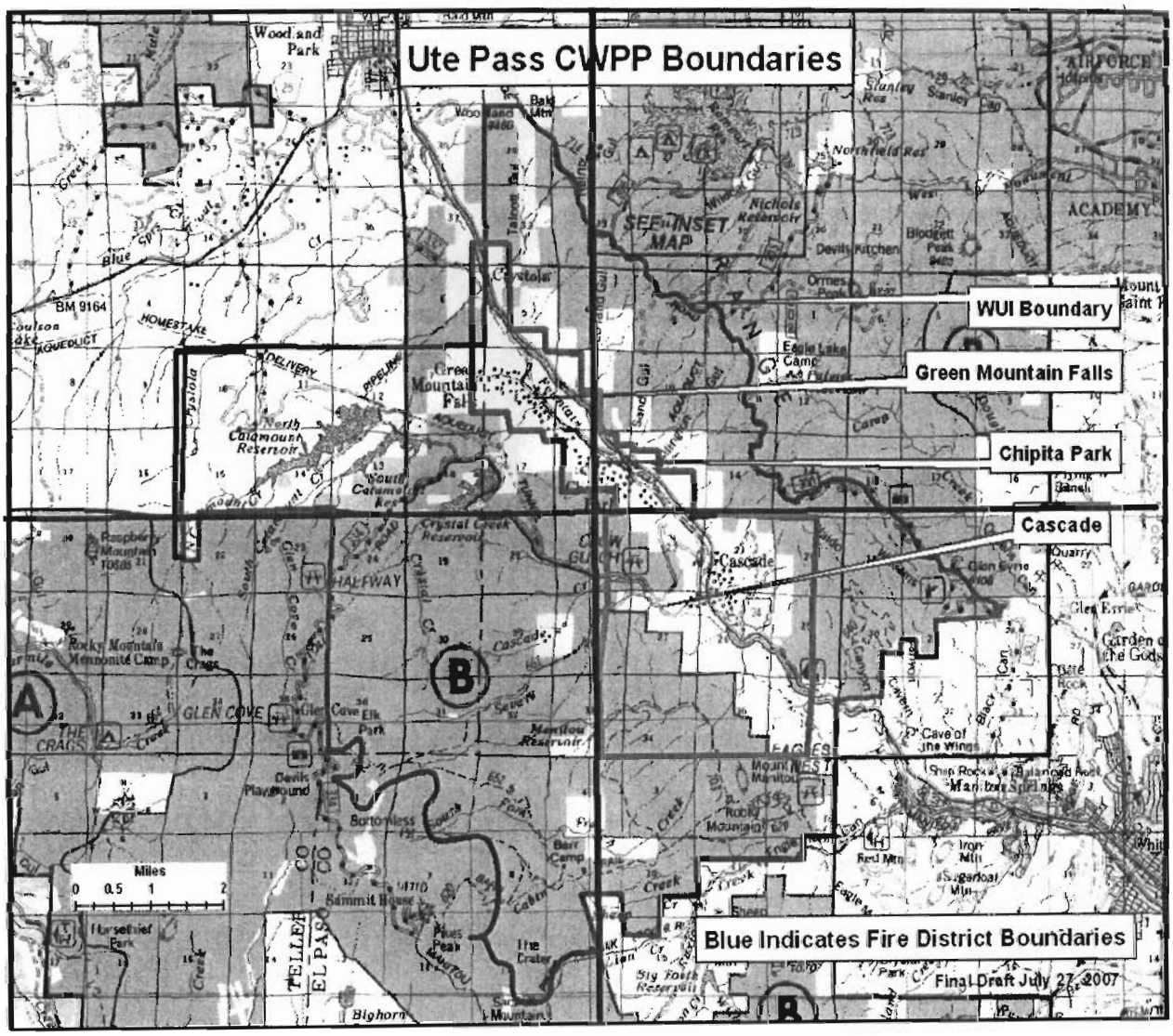
The Rampart Range Road forms the northeast WUI boundary, and the city of Manitou Springs is at the southeast corner, but not included in the plan. The southern boundary roughly follows the Pikes Peak Cog Railway. The western boundary meanders follows the tree line on Pikes Peak and includes a large section of private lands surrounding the Catamount Reservoirs in the northwest corner of the Ute Pass CWPP boundaries.

Ute Pass CWPP Maps

These Ute Pass CWPP maps are found on consecutive pages that follow:

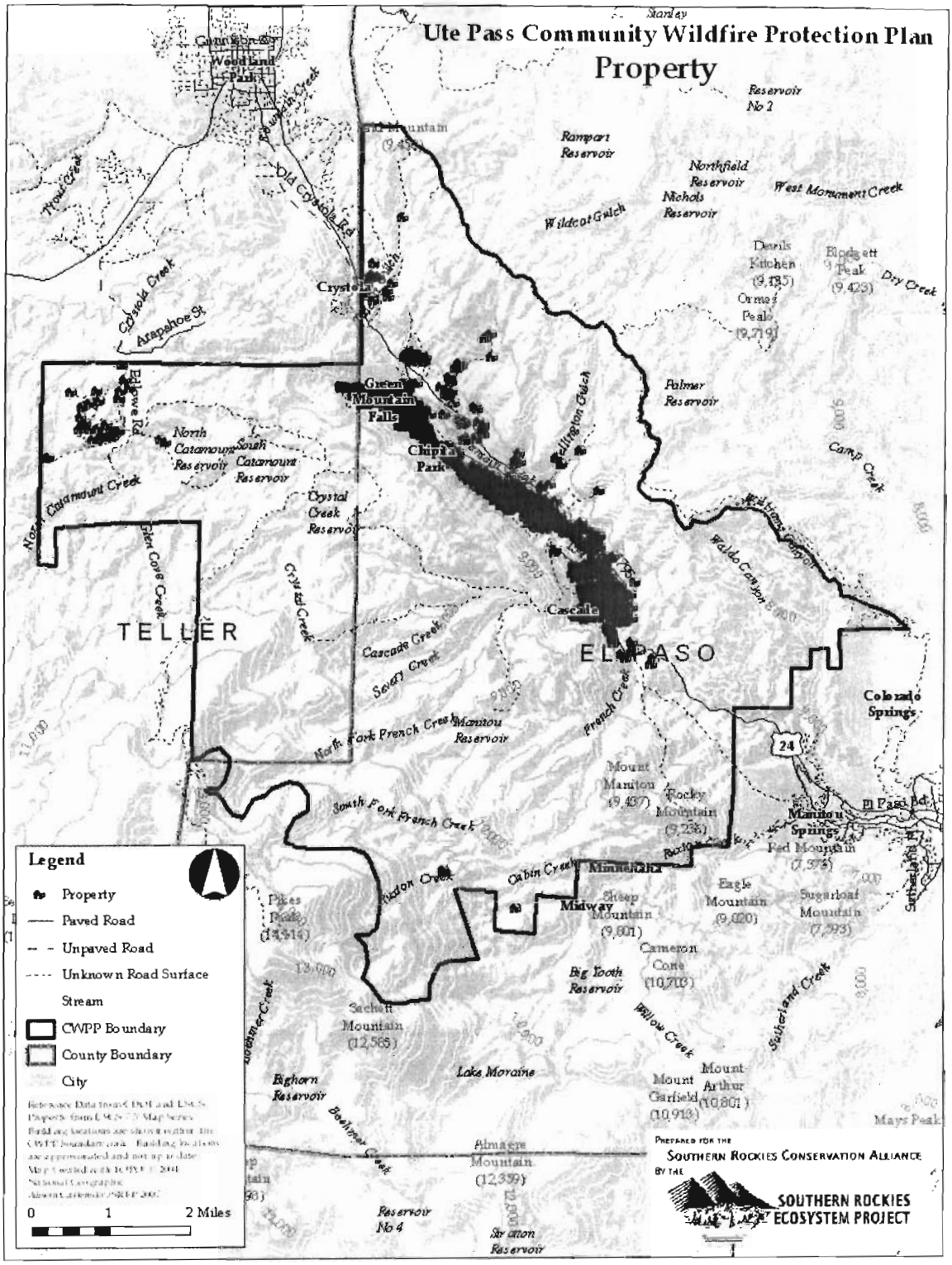
- Ute Pass CWPP Boundaries
- Ute Pass CWPP Property
- Ute Pass CWPP Land Ownership

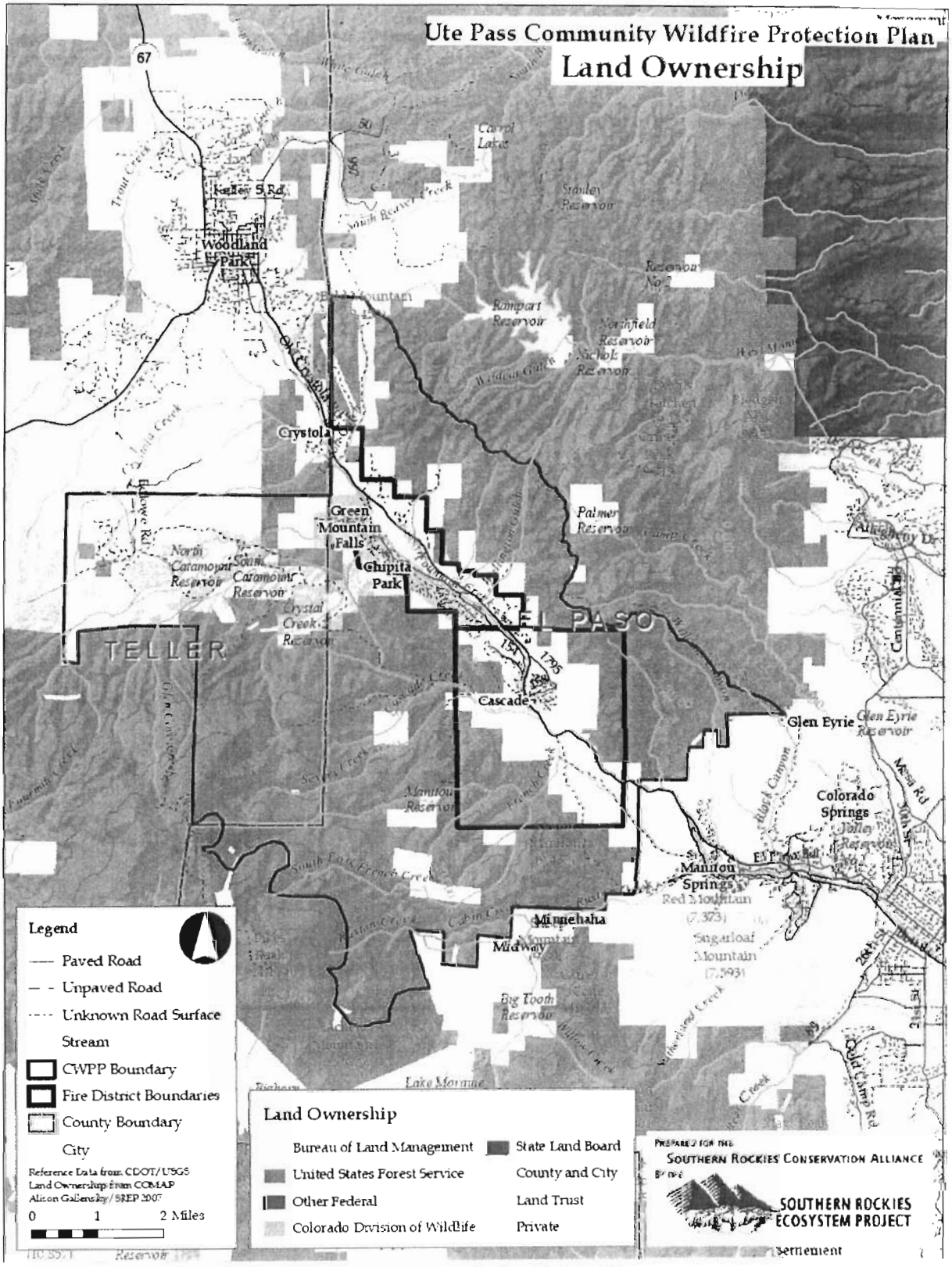
# Ute Pass CWPP Boundaries




**Legend**

**CWPP Boundaries – Orange**
**Fire District Boundaries - Blue**


Ute Pass Community Wildfire Protection Plan
Property
Legend
Property
Paved Road
Unpaved Road
Unknown Road Surface
Stream
CWPP Boundary
County Boundary
City
0 1 2 Miles
TELLER
EL PASO
Woodland Park
Crystola
Green Mountain Falls
Chipita Park
Cascade
Colorado Springs
Manitou Springs
Midway
Rampart Reservoir
Northfield Reservoir
Nichols Reservoir
Palmer Reservoir
North Catamount Reservoir
South Catamount Reservoir
Crystal Creek Reservoir
Manitou Reservoir
Big Tooth Reservoir
Bighorn Reservoir
Lake Moraine
Reservoir No 4
Stratton Reservoir
Pikes Peak (14,114)
Mount Manitou (9,437)
Rocky Mountain (9,236)
Red Mountain (7,375)
Sheep Mountain (9,801)
Eagle Mountain (9,020)
Sugarloaf Mountain (7,393)
Cameron Cone (10,710)
Sacket Mountain (12,565)
Mount Garfield (10,913)
Mount Arthur (10,801)
Almagre Mountain (12,339)
Mays Peak
Prepared for the Southern Rockies Conservation Alliance
By the Southern Rockies Ecosystem Project


Ute Pass Community Wildfire Protection Plan
Land Ownership
Woodland Park
Crystola
Green Mountain Falls
Chipita Park
Cascade
Glen Eyrie
Colorado Springs
Manitou Springs
Minnehaha
Midway
TELLER
EL PASO
Legend
Paved Road
Unpaved Road
Unknown Road Surface
Stream
CWPP Boundary
Fire District Boundaries
County Boundary
City
Reference Data from: CDOT/USGS
Land Ownership from: COMAP
Alison Gallensky/ SREP 2007
0 1 2 Miles
Land Ownership
Bureau of Land Management
United States Forest Service
Other Federal
Colorado Division of Wildlife
State Land Board
County and City
Land Trust
Private
Prepared for the
Southern Rockies Conservation Alliance
by the
Southern Rockies Ecosystem Project

## B. Physical and Biological Characteristics

1. Topography

Rugged topography with steep terrain characterizes most of the area within the CWPP WUI boundary. (Refer to the Aspect – Solar Orientation of Slope map on the next page). The northwest section (Section 1) rises abruptly from Chipita Park, at an elevation of 7,500 feet, to over 9,500 near the three reservoirs that provide water for the Ute Pass communities and the city of Colorado Springs. Some of the slopes in this section have grades up to 45 percent. There are a few areas that have grades exceeding 50 percent. The southwestern section (Section 3) is essentially in Pike National Forest, and includes portions of Pikes Peak, up to and just above timberline at elevations exceeding 11,500 feet. The northeast boundary (Section 2) is near the crest of the Rampart Range at over 9,200 feet elevation. The southeast corner (in Section 4) adjacent to Manitou Springs near the bottom of Ute Pass is at approximately 6,500 feet elevation. With the exception of the pass itself, which morphs from a canyon at the base to a wider valley near the three communities, much of the terrain consists of mountain and gulch topography.

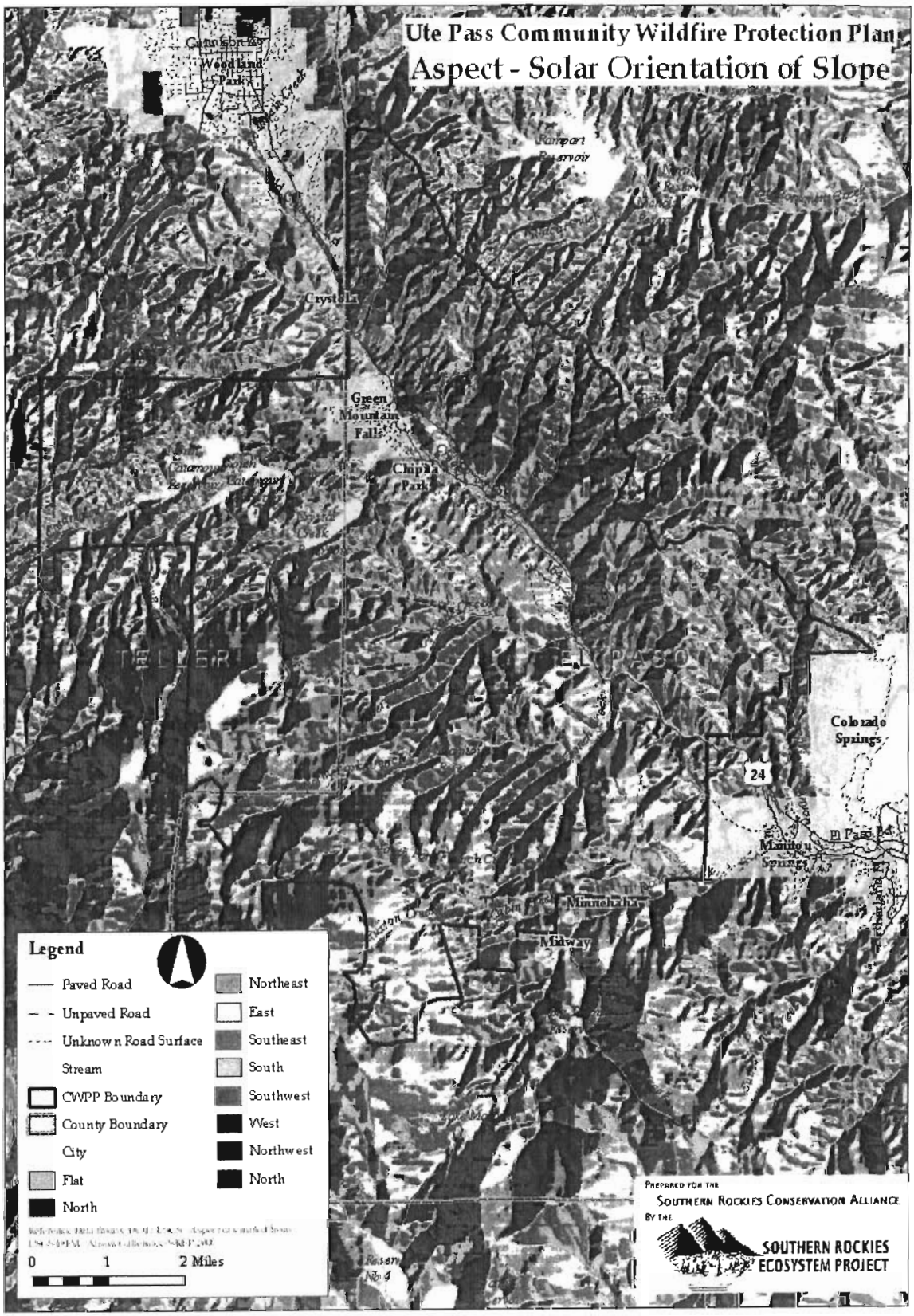
Fires burning in narrow drainages and steep terrain common in this area present special hazards. The steep drainages of Fountain Creek and its tributaries will influence fire behavior in predictable ways. First is that these drainages are natural chimneys. During the day, warm air usually rises upward through drainages, pushing a fire ahead. Fires burning in the lower canyon might be expected to funnel up the canyon threatening all the communities above. Drainages may also funnel and intensify winds, increasing fire intensity, and causing unpredictable fire behavior.

Second, a fire on the steep slopes above a drainage would be expected to burn quickly and with great intensity uphill. On steep slopes, heat rising from a fire dries the fuels above and increases the ease of ignition and rate of fire spread uphill. This greatly increases the risk to structures above a fire. The risk to firefighters is so ominous that it is not considered safe to work above a fire on a steep slope. Third, in a narrow canyon, such as the canyon between Manitou and Cascade, a fire can quickly jump from one slope to the other causing an additional hazard for firefighters.

2. Vegetation

Vegetation is the most important element to consider when determining how fire hazard should be mitigated. There are three elements that will determine the intensity of a fire: topography, weather, and fuel (vegetation). Only vegetation can be altered to moderate fire behavior.

The vegetation cover in the areas surrounding the communities varies from mixed conifer forest in the northeast section to predominantly Douglas fir and ponderosa pine in the western sections. Ascending Pikes Peak, in the southwestern section (Section 3), the forest changes to spruce-fir until the krummholz zone and timberline is reached at about 11,000 feet. Lower in the pass, near U.S. Highway 24 and Fountain Creek, semi-desert grassland and Gambel oak shrubland predominate. (Refer to the Vegetation Cover map on page 32.)


Ute Pass Community Wildfire Protection Plan
Aspect - Solar Orientation of Slope
Woodland Park
Rampart Reservoir
Crystal
Green Mountain Falls
Chipita Park
Colorado Springs
24
Manitou Springs
Midway
Legend
Paved Road
Unpaved Road
Unknown Road Surface
Stream
CWPP Boundary
County Boundary
City
Flat
North
Northeast
East
Southeast
South
Southwest
West
Northwest
North
0 1 2 Miles
Prepared for the
Southern Rockies Conservation Alliance
by the
Southern Rockies Ecosystem Project

The greatest threat to life and property exists in the three communities along Fountain Creek. With respect to the populated areas, the Fountain Creek drainage can be said to divide the area into two general forest cover types based on the slope. The vegetation descriptions that follow are general. Areas of atypical vegetation are common within the general descriptions. Prescriptions to mitigate fire hazard should be specific to the conditions found on a particular site, and a knowledgeable forester should be consulted before any forest management is undertaken.

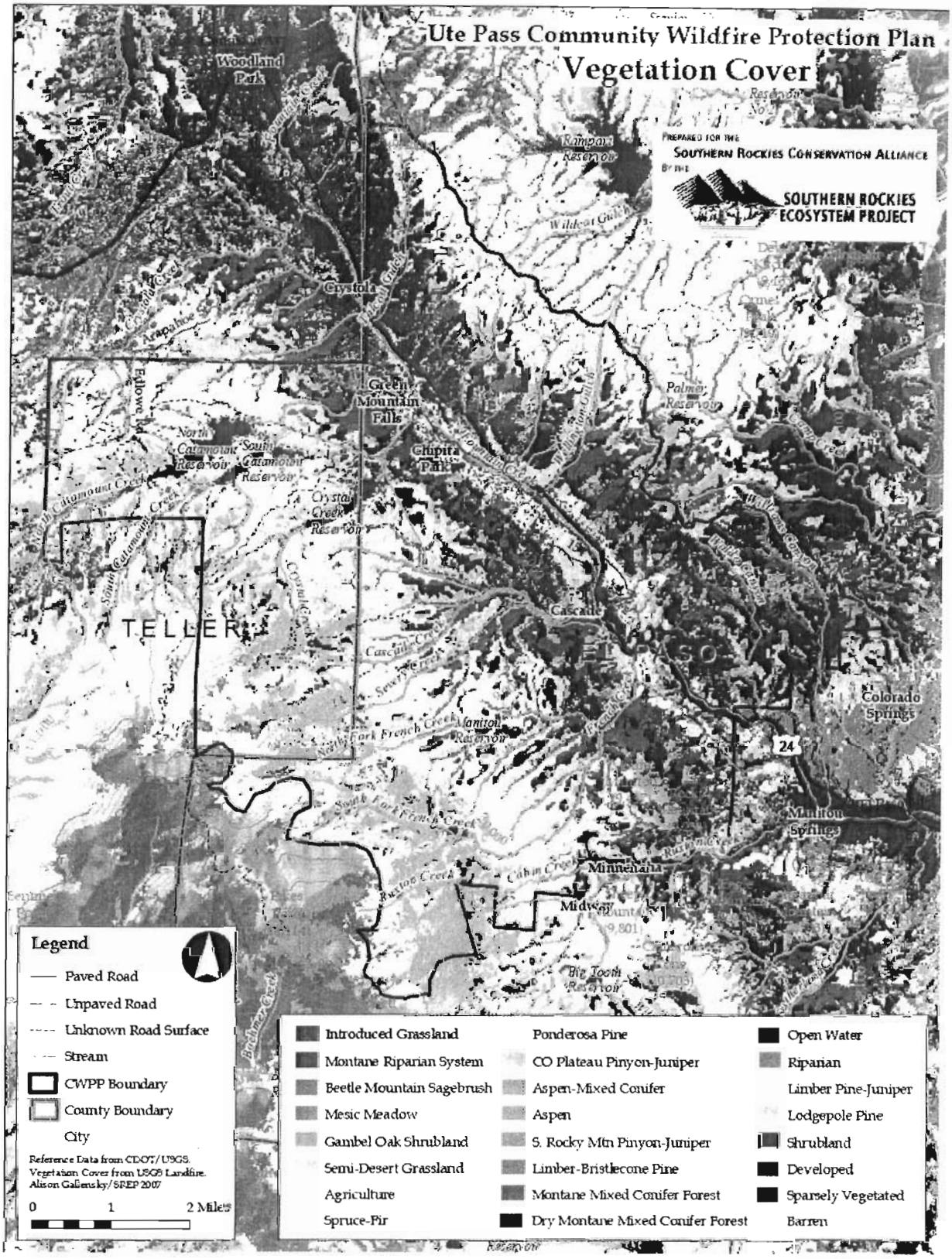
North-facing slopes receive less solar radiation, and are cooler and moister. The vegetation here is a mixed conifer forest with remnants of aspen. Historically, one might expect these forests to be dominated by ponderosa pine and aspen. Ponderosa and aspen require direct sunlight for growth, and most of the present examples of these two trees grew in after the "big burn" in the 1850s. Without fire suppression in the twentieth century, frequent low intensity fires would have thinned these ponderosa and aspen stands. An open forest of mature ponderosa should have developed with openings in the forest canopy. Aspen and younger ponderosa would be present in the openings.

Without the thinning of low intensity fires, the forest floor became shaded by the dense ponderosa and shade tolerant conifers such as Douglas-fir and spruce that have sprouted beneath the ponderosa. Shade tolerant conifers have also overtopped and crowded out many of the aspen stands. The result of this unnatural succession has increased the probability of intense, damaging fires. In the event of a fire, the shade tolerant trees near the ground ignite and carry fire into the closed canopy. These fires are called crown fires (sometimes the term "catastrophic fire" is used as a synonym). If severe weather conditions exist, crown fires may rage beyond the ability of firefighters to control them. The Hayman fire is, of course, the most familiar example of an intense crown fire.

North of Fountain Creek—the south facing slopes—might be best described as an oak-pine savanna. Greater solar radiation creates a drier environment and Gambel oak (scrub oak) are intermixed with stands of ponderosa pine. The oak is a highly flammable species capable of burning with great intensity. No greater illustration of the danger of fire in oak is necessary than to recall the loss of fourteen firefighters during the South Canyon Fire at Storm King Mountain in 1994. That fire did not occur in a conifer forest, but during a crown fire in dense Gambel oak.

3. Climate

The climate within the boundaries of the Ute Pass WUI is quite typical of the Colorado Front Range, with moderate average temperatures, but large temperature differentials between day and night because of the low moisture content of the air. Because of Colorado's distance from major sources of moisture (the Pacific Ocean and the Gulf of Mexico), precipitation on the eastern foothills and slopes of the Front Range is generally light. Usually, the mountain ranges receive most of their precipitation as snow during the winter months. Sometimes in summer, the weather patterns will shift enough to bring very dry air from the southwest desert areas, and in years of drought, this can exacerbate fire danger. The southern Front Range, which includes the Ute Pass area, can receive rainfall in late summer from the "Southwest monsoon" that brings moisture up from the south. In an article titled "Climate of Colorado," Pielke, et. al., (2003) explains that "some years, local thunderstorms form nearly every afternoon in and near the mountains. The last half of July and much of August is particularly prone to mountain thunderstorms while June is often a much drier month in the high country ... Lightning also triggers forest fires in drier years."


Ute Pass Community Wildfire Protection Plan
Vegetation Cover
Prepared for the
Southern Rockies Conservation Alliance
by the
Southern Rockies Ecosystem Project
Woodland Park
Crystola
Green Mountain Falls
Chipita Park
Cascade
Colorado Springs
Manitou Springs
Minnehaha
Midway
TELLER
Legend
Paved Road
Unpaved Road
Unknown Road Surface
Stream
CWPP Boundary
County Boundary
City
Reference Data from CDOT/USGS.
Vegetation Cover from USGS Landfire.
Alison Gallensky/SREP 2007
0 1 2 Miles
Introduced Grassland
Montane Riparian System
Beetle Mountain Sagebrush
Mesic Meadow
Gambel Oak Shrubland
Semi-Desert Grassland
Agriculture
Spruce-Fir
Ponderosa Pine
CO Plateau Pinyon-Juniper
Aspen-Mixed Conifer
Aspen
S. Rocky Mtn Pinyon-Juniper
Limber-Bristlecone Pine
Montane Mixed Conifer Forest
Dry Montane Mixed Conifer Forest
Open Water
Riparian
Limber Pine-Juniper
Lodgepole Pine
Shrubland
Developed
Sparsely Vegetated
Barren

The Ute Pass communities are at the base of Pikes Peak, with the southwest CWPP WUI boundary encompassing a portion of the mountain. The "Climate of Colorado" article cited above goes on to say that, "backing the foothills are the mountain ranges above 9,000 feet with the higher peaks over 14,000 feet. The most dramatic feature is Pikes Peak near Colorado Springs where elevations rise abruptly from less than 5,000 feet near Pueblo in the Arkansas Valley to over 14,000 feet at the top of the mountain. During the summer months, this topographic feature becomes a thunderstorm machine as thunderstorms develop almost any day that humidity is sufficiently high." Winds can either move up or down Ute Pass, depending on the location of high and low pressure systems relative to the immediate area. In winter, it is not uncommon for air to descend from aloft and move down the pass at high speeds. This warms and dries the air considerably, forming the relatively warm Chinook "snow-eater" winds. Winds, accompanied by relatively dry air and lack of significant precipitation during any season can produce conditions that increase potential wildfire danger.

Monthly temperature and precipitation averages are shown in the chart at the bottom of this page. They were recorded within the boundaries of the Ute Pass CWPP. It should be noted, however, that the Ruxton Park weather station is located at 9,050 feet elevation, in the southwestern section (Section 3) of the WUI. Because this is approximately 1,000–2,000 feet higher than the elevation of the communities themselves, temperature averages in those communities will be 5–10 degrees warmer than at Ruxton Park. Likewise, precipitation in those communities will be somewhat less than at the weather station.

**Climate Summary (Monthly)**
**Ute Pass Community Wildfire Protection Plan**

The following data have been recorded at the Ruxton Park, Colorado Weather Station at 9,050 feet elevation, part way up Pikes Peak. It is within the Ute Pass CWPP Wildland Urban Interface boundary, and is the closest weather station to the Ute Pass communities, approximately 5 to 10 miles depending on the community. (Data from the Western Regional Climate Center)

Period of Record: 9/1/1959 to 12/31/2005

| Month | Average Maximum Temp (F) | Average Minimum Temp (F) | Average Total Precip. (in.) | Average Total Snowfall (in.) | Average Snow Depth (in.) |
|---|---|---|---|---|---|
| January | 34.0 | 7.4 | 0.63 | 9.9 | 6 |
| February | 35.3 | 7.9 | 0.86 | 15.3 | 7 |
| March | 39.5 | 13.0 | 1.86 | 28.8 | 9 |
| April | 46.7 | 20.3 | 2.71 | 29.6 | 7 |
| May | 56.6 | 28.6 | 2.45 | 10.2 | 1 |
| June | 66.3 | 35.9 | 2.55 | 1.2 | 0 |
| July | 71.4 | 40.7 | 3.80 | 0.0 | 0 |
| August | 68.8 | 39.2 | 3.95 | 0.0 | 0 |
| September | 62.7 | 32.7 | 1.81 | 2.5 | 0 |
| October | 59.9 | 24.4 | 1.32 | 13.1 | 1 |
| November | 40.8 | 14.9 | 0.93 | 14.0 | 3 |
| December | 35.0 | 8.6 | 0.86 | 15.2 | 5 |
| Annual | 50.8 | 22.8 | 23.72 | 139.9 | 3 |

[Dave Root, Assistant District Forester, Colorado State Forest Service, Woodland Park District, was a major contributor to the Topography and Vegetation narratives of this section.]

## V. Assessing the Risk

### A. Introduction to the Wildfire Risk Assessment

The wildfire risk assessment is an analysis of the potential for damage or loss due to wildfire to the many natural and community values within the CWPP WUI boundaries. The risk could be to people, buildings, personal and commercial property, as well as to historic, cultural, and ecological resources. The risk assessment guides mitigation planning and provides information to residents regarding reduction of structural vulnerability. In April 2007, a questionnaire was sent to residents of the three communities to assess their knowledge and concerns about the wildfire threat. Volunteers administered some of the questionnaires in person, and some were sent out using email lists to a sampling of residents. There were 100 respondents to the questionnaire. The results of this survey give a general snapshot of community awareness and interest in issues represented by a CWPP. The CWPP Committee was pleasantly surprised at the generally positive responses. Space was provided for comments at the bottom of the questionnaire. (See Ute Pass Survey Results below. Editors' notes are in brackets.)

**Ute Pass Community Wildfire Protection Plan Survey Results**

Please select the appropriate questions and √ answers– [100 respondents as of 4/30/07]

1.) Are you concerned about the threat of wildfire to your property?

YES__**95**__ (go to Question 2 -)

NO___**4**____ (go to Question 3 -)

Not Sure?__**3**__ (go to Question 5 -) [Two people checked two responses here, to give a total greater than 100.]

2.) Have you taken any steps to reduce the wildfire threat to your property?

YES__**82**___ (go to Question 5 -)

NO___**18**___ (go to Question 4 -)

3.) Why are you not concerned?

a. Loss to Wildfire is a risk I accept ___**8**_____
b. I'm not aware that there is a problem __**3**____
c. I do not perceive a risk to my property__**2**____
d. I see no risk to wildfire at all _____

4.) I have not taken any steps to reduce the wildfire threat because –

a. It costs too much ___**2**____
b. It will destroy my view or privacy__**3**____
c. I do not want to cut any trees____**4**_____
d. I'm unsure what to do next_____**12**_____

5.) Would you like to receive more information on the wildfire threat in the Ute Pass area?

Yes__**87**___ No___**13**_____

6.) I would prefer to receive information via: (check all that apply)

Community Meeting__27_Mail__78___Internet ___44___

[People prefer to get info by mail.]

Comments:

*...I paid a team to cut all long grass, rake, bag many, many bags.*
*...Property has lots of scrub oak and removal would take from erosion problems.*
*...Have materials and training for firewise protection.*
*...Thank you so much. ...Thanks! ...Thank you very much! ...Ban all fireworks – large fines.*
*...Thanks for your work on this important issue*
*...We've cut diseased trees – at least 20 – not many close to house – house is stucco – you always worry but accept some risk.*

*...We try to keep the limbs off the roof but would be reluctant to cut down a tree. We have only a few large trees on the lot and they are all near the house.*

*...I removed many beetle trees from my property, but the house clearly has a lot of trees around it very close by. Removing them would make it look aesthetically bad, and would require a large bucket truck. So, I have left them, as they are really big trees. Some neighbors have done an excellent job of tree removal, while others have done very little until the local fire department came through and cleaned a lot of it out. If you can afford a house up here, you can afford to take care of the trees.*

*...I have confidence in our fearless and knowledgeable and ever ready to respond Fire Department!!!*
*...Our Ute Pass area wildland teams are the world's greatest!!*
*...Good Work!*
*...This work is important to the preservation of the Ute Pass area. Keep up the good work!*

**B. Community Values at Risk**

Most of the work in developing this CWPP involved assessing community risks from wildfire. Through this process, relative risk ratings were generated for various neighborhoods in the three communities. These ratings are used to prioritize locations for fuel treatment projects to mitigate the risk from wildfire, reduce structural vulnerability, and improve emergency preparedness.

The CWPP addresses six potential sources of wildfire risk:

- Current vegetative condition and wildfire fuel hazards
- Weather and climate patterns
- Fire history in areas within and adjacent to the WUI
- Homes and infrastructure vulnerability to wildfire
- Level of community-level fire-fighting preparedness
- Historic/cultural/ecological values at risk due to wildfire

The Ute Pass CWPP Committee defined the following three communities to be addressed in the risk assessment:

- Town of Green Mountain Falls
- Cascade (unincorporated)
- Chipita Park (unincorporated)

1. Structural Risk Assessment

Of most immediate concern to many in the communities is the vulnerability to fire of homes and related structures. In May 2007, six community volunteers conducted neighborhood structural risk surveys. Working in pairs, a driver and a recorder, they visited neighborhoods in each of the three communities. They tallied the presence of each risk factor for each home or associated building along their sampling route. The volunteers were trained in the use of the assessment instrument so that their tallying procedures were consistent. All structural risk surveys were conducted within a two-week period before the end of May.

The structural risk assessment uses a scoring model to determine overall ratings of High, Medium, or Low Risk for each neighborhood. The overall ratings are compiled from the following risk categories: Topography (accessibility)/Vegetation, Roof Type, Building Siding, Overhanging Structures, Lack of Defensible Space, and Lack of Fire Fighting Cistern. A Risk Score is computed for each category, then the scores for all categories are added to generate a Total Risk Score for the neighborhood. Each category in a neighborhood gets a Risk Score of 1.0 if the risk is High, except for Topography and Defensible Space (which get Risk Scores of 2.0 if risk is High). Those latter categories are weighted twice as heavily to emphasize their importance. The percentage of buildings that exhibit a risk factor in each sample is recorded as a decimal. For example, if 250 out of 500 buildings in a neighborhood sample have wood siding, then the Risk Score for that category is 250/500 = 0.5. The Risk Scores for each category are then added to get a Total Risk Score. These Total Risk Scores are then converted to a Risk Rating for each neighborhood. Scores of 1–2 are interpreted as Low Risk, 3–4 as Medium Risk, and 5–7 as High Risk.

From the results of the Structural Risk Assessment surveys, the following Relative Risk Ratings for each neighborhood were obtained:

Cascade (combined neighborhoods, excluding Pikes Peak Mountain Estates): **High Risk**
Cascade (Pikes Peak Mountain Estates): **Low to Medium Risk**

Chipita Park (combined neighborhoods, excluding W. Chipita Park Road and Fountain Road): **High Risk**
Chipita Park (Chipita Park Rd. N. side, W. of Picabo Rd.; Fountain Rd.): **Medium Risk**

Green Mountain Falls (Spruce and Park Streets, with adjoining streets): **High Risk**
Green Mountain Falls (Hondo Street): **High Risk**
Green Mountain Falls (Belvidere Street): **Medium to High Risk**

(Refer to the Structural Risk Assessment summary charts beginning on the next page.)

## Data for Structural Risk Assessment in the Community of Cascade

| | | Percent of Buildings With Each Risk Factor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Community **Cascade,** Chipita Park Gr. Mtn. Falls<br><br>community by streets as boundaries or other method with approximate land area | Topography of the Neighborhood Surveyed (such as access for fire district, slope, vegetation, dead trees, etc.) | Number of Buildings Surveyed | Wood Shingle Or Wood Shake Roof | Wood Siding Or Other | Overhanging Eaves, Balconies, Decks, and/or Unenclosed Stilt Construction | Lack of Defensible Space | Lack of Fire Fighting Cistern | Risk Score | Relative Risk Rating |
| Cascade<br><br>Combined Neighborhoods. | Steep topography. Many narrow roads. Lots of scrub oak. Many homes with juniper bush surrounding the house. Lots of ladder fuel.<br><br>**2.00 Risk Score** | 298 | **0.04 Risk Score**<br><br>11/298 | **0.83 Risk Score**<br><br>247/298 | **0.35 Risk Score**<br><br>105/298 | **1.83 Risk Score**<br><br>272/298 x 2 | No obvious hydrant or challenging access.<br><br>**0.10 Risk Score**<br><br>29/298<br><br>Rampart Terrace: 1 hydrant nearly buried. 1 standing pipe. | **5.14** | **High Risk** |

For each section or neighborhood, calculate *Risk Score and Rating* using these scales.

**Risk Scores:** 2 = Challenging topography, 1 = Wood roofing, 1 = Wood Siding, 1 = Overhanging Eaves, balconies, decks, etc., 2 = Lack of defensible space, 1 = Lack of fire-fighting water access or challenging access.

Total scores applied to a neighborhood to get the following ratings:

**Risk Ratings:** 1–2 = Low Risk 3–4 = Medium Risk 5–7 = High Risk

## Data for Structural Risk Assessment in the Community of Cascade

| | | Percent of Buildings With Each Risk Factor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Community **Cascade,** Chipita Park, Gr. Mtn. Falls<br><br>community by streets as boundaries or other method with approximate land area | Topography of the Neighborhood Surveyed (such as access for fire district, slope, vegetation, dead trees, etc.) | Number of Buildings Surveyed | Wood Shingle Or Wood Shake Roof | Wood Siding Or Other | Overhanging Eaves, Balconies, Decks, and/or Unenclosed Stilt Construction | Lack of Defensible Space | Lack of Fire Fighting Cistern | Risk Score | Relative Risk Rating |
| Pikes Peak Mountain Estates | Sloping topography.<br>Accessible.<br>A few challenging driveways.<br><br>**1.00 Risk Score** | **18** | **0.00 Risk Score**<br><br>0/18 | **0.11 Risk Score**<br><br>2/18 | **0.33 Risk Score**<br><br>6/18 | **0.67 Risk Score**<br><br>6/18 x 2 | No obvious hydrant or challenging access.<br><br>**0.00 Risk Score**<br><br>0/18 | **2.11** | **Low to Medium Risk** |

For each section or neighborhood, calculate *Risk score and Rating* using these scales.

**Risk Scores:** 2 = Challenging topography, 1 = Wood roofing, 1 = Wood Siding, 1 = Overhanging Eaves, balconies, decks, etc., 2 = Lack of defensible space, 1 = Lack of fire fighting water access or challenging access.

Total scores applied to a neighborhood to get the following ratings:
**Risk Ratings:** 1–2 = Low Risk 3–4 = Medium Risk 5–7 = High Risk

## Data for Structural Risk Assessment in the Community of Chipita Park

| | | Percent of Buildings With Each Risk Factor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Community Cascade, **Chipita Park,** Gr. Mtn. Falls<br><br>community by streets as boundaries or other method with approximate land area | Topography of the Neighborhood Surveyed (such as access for fire district, slope, vegetation, dead trees, etc.) | Number of Buildings Surveyed | Wood Shingle Or Wood Shake Roof | Wood Siding Or Other | Overhanging Eaves, Balconies, Decks, and/or Unenclosed Stilt Construction | Lack of Defensible Space | Lack of Fire Fighting Cistern | Risk Score | Relative Risk Rating |
| Chipita Park<br><br>[Combined Neighborhoods] | Steep to extreme slopes. Dense vegetation. (pine/fir/spruce) Difficult access. Houses close together. Lots of unattended dead trees both down and standing. Signs of Mountain Pine Beetle infestation.<br><br>**2.00 Risk Score** | **442** | **.04 Risk Score**<br><br>17/442 | **0.91 Risk Score**<br><br>402/442 | **0.55 Risk Score**<br><br>254/442 | **1.48 Risk Score**<br><br>328/442 | No obvious hydrant or challenging access.<br><br>**0.35 Risk Score**<br><br>154/442 | **5.33** | **High Risk** |

For each section or neighborhood, calculate *Risk score and Rating* using these scales.

**Risk Scores:** 2 = Challenging topography, 1 = Wood roofing, 1 = Wood Siding, 1 = Overhanging Eaves, balconies, decks, etc., 2 = Lack of defensible space, 1 = Lack of fire fighting water access or challenging access.

Total scores applied to a neighborhood to get the following ratings:
**Risk Ratings:** 1–2 = Low Risk 3–4 = Medium Risk 5–7 = High Risk

## Data for Structural Risk Assessment in the Community of Chipita Park

| | | Percent of Buildings With Each Risk Factor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Community Cascade, **Chipita Park,** Gr. Mtn. Falls<br><br>community by streets as boundaries or other method with approximate land area | Topography of the Neighborhood Surveyed (such as access for fire district, slope, vegetation, dead trees, etc.) | Number of Buildings Surveyed | Wood Shingle Or Wood Shake Roof | Wood Siding Or Other | Overhanging Eaves, Balconies, Decks, and/or Unenclosed Stilt Construction | Lack of Defensible Space | Lack of Fire Fighting Cistern | Risk Score | Relative Risk Rating |
| Boundaries:<br><br>Chipita Park Rd. (N. side) Fountain (W) Picabo (E. Side) | Moderate topography. Easy access. *Moderate vegetation density. *Exception being cottonwoods along Fountain Creek.<br><br>**1.00 Risk Score** | **58** | **0.02 Risk Score** 1 wood shake<br><br>1/58 | **0.71 Risk Score** wood<br><br>41/58 | **0.43 Risk Score**<br><br>25/58 | **0.86 Risk Score**<br><br>25/58 x 2<br><br>No defensible space | No obvious hydrant or challenging access.<br><br>**0.34 Risk Score**<br><br>20/58 | **3.36** | **Medium Risk** |

For each section or neighborhood, calculate *Risk score and Rating* using these scales.

**Risk Scores:** 2 = Challenging topography, 1 = Wood roofing, 1 = Wood Siding, 1 = Overhanging Eaves, balconies, decks, etc., 2 = Lack of defensible space, 1 = Lack of fire fighting water access or challenging access.

Total scores applied to a neighborhood to get the following ratings:
**Risk Ratings:** 1–2 = Low Risk 3–4 = Medium Risk 5–7 = High Risk

## Data for Structural Risk Assessment in the Community of Green Mountain Falls

| | | Percent of Buildings With Each Risk Factor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Community Cascade, Chipita Park, **Gr. Mtn. Falls** community by streets as boundaries or other method with approximate land area | Topography of the Neighborhood Surveyed (such as access for fire district, slope, vegetation, dead trees, etc.) | Number of Buildings Surveyed | Wood Shingle Or Wood Shake Roof | Wood Siding Or Other | Overhanging Eaves, Balconies, Decks, and/or Unenclosed Stilt Construction | Lack of Defensible Space | Lack of Fire Fighting Cistern | Risk Score | Relative Risk Rating |
| Spruce and Park Streets with adjoining streets | Steep topography. Difficult access. Dense vegetation. **2.00 Risk Score** | **64** | **0.06 Risk Score** 4/64 | **0.92 Risk Score** 59/64 | **0.50 Risk Score** 32/64 | **1.78 Risk Score** 57/64 x 2 | No obvious hydrant or challenging access. **0.44 Risk Score** 28/64 | **5.70** | **High Risk** |

For each section or neighborhood, calculate *Risk score and Rating* using these scales.

**Risk Scores:** 2 = Challenging topography, 1 = Wood roofing, 1 = Wood Siding, 1 = Overhanging Eaves, balconies, decks, etc., 2 = Lack of defensible space, 1 = Lack of fire fighting water access or challenging access.

Total scores applied to a neighborhood to get the following ratings:
**Risk Ratings:** 1–2 = Low Risk 3–4 = Medium Risk 5–7 = High Risk

## Data for Structural Risk Assessment in the Community of Green Mountain Falls

| | Percent of Buildings With Each Risk Factor | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Community Cascade, Chipita Park, **Gr. Mtn. Falls**<br><br>community by streets as boundaries or other method with approximate land area | Topography of the Neighborhood Surveyed (such as access for fire district, slope, vegetation, dead trees, etc.) | Number of Buildings Surveyed | Wood Shingle Or Wood Shake Roof | Wood Siding Or Other | Overhanging Eaves, Balconies, Decks, and/or Unenclosed Stilt Construction | Lack of Defensible Space | Lack of Fire Fighting Cistern | Risk Score | Relative Risk Rating |
| Hondo<br>Belvidere | Hondo: Steep topography. Difficult Access.<br>Belvidere: Moderate Topography and access. Moderate to dense vegetation. (trees & shrubs)<br><br>**2.00 Risk Score** | **98** | **0.06 Risk Score**<br><br>6/98 | **0.97 Risk Score**<br><br>95/97 | **0.47 Risk Score**<br><br>47/98 | **0.98 Risk Score**<br><br>48/98 x 2 | No obvious hydrant or challenging access.<br><br>**0.17 Risk Score**<br><br>17/98 | **4.65** | **High Risk =Hondo**<br><br>**M/High Risk = Belvidere** |

For each section or neighborhood, calculate *Risk score and Rating* using these scales.

**Risk Scores:** 2 = Challenging topography, 1 = Wood roofing, 1 = Wood Siding, 1 = Overhanging Eaves, balconies, decks, etc., 2 = Lack of defensible space, 1 = Lack of fire fighting water access or challenging access.

Total scores applied to a neighborhood to get the following ratings:
**Risk Ratings:** 1–2 = Low Risk 3–4 = Medium Risk 5–7 = High Risk

Fire Fighting Preparedness Risk charts also were completed by the two local fire districts, the USDA Forest Service, and Colorado Springs Utilities. In the case of the fire districts, (Cascade and Green Mountain Falls/Chipita Park), land within the districts are represented. In the case of the charts completed by the forest service and utilities, reference is to land adjacent to the communities and within the Sections listed. Refer to the boundary maps in Section IV to locate the specific districts, communities, and Sections to which these charts refer. Also included is a table giving the number of fire-related calls by each fire district. The charts are self-explanatory, and are found on the pages that follow. In addition, there are four Wildfire Hazard Area Maps. These are located in Appendix A. A map showing the Historical Sites within the CWPP boundaries is on the following page.

## Fire Fighting Preparedness Risk by Community and/or Sections
(completed by Cascade Volunteer Fire Department)

| Communities or Sections Outside of Populated Area | [1] Sufficient Access/ Egress | [2] Firefighting Water Resources (cisterns, streams, hydrants) | [3] Distance from Fire Department | [4] Community Land Area | [5] Community Topography | [6] Firefighters' Preparedness &Training | [7] Number of Firefighters in District | Risk Score | Relative Risk Rating |
|---|---|---|---|---|---|---|---|---|---|
| Cascade | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 17 | **High** |
| *Chipita Park | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 17 | **High** |
| Green Mountain Falls | | | | | | | | | |
| Section 1 | | | | | | | | | |
| Section 2 | | | | | | | | | |
| Section 3 | | | | | | | | | |
| Section 4 | | | | | | | | | |

Use this scale to complete the table.

[1] Yes = 1, No = 3 [2] 3 water sources = 1, 2 water sources = 2, 1 water source = 3 [3] <1 mi = 1, 1-2 mi = 2, >2 mi = 3 [4] Small = 1, Medium = 2, Large = 3 [5] Flat = 1, Moderate/Steep = 2, Very Steep = 3 [6] Highly Prepared = 1, Moderately Prepared = 2 [7] Adequate = 1, Less than Adequate = 3

Use this scale to complete the risk score and rating: 7–10 = Low, 11–15 = Medium, 16–20 = High

*Cascade also serves homes in the eastern portion of Chipita Park, so Chipita Park is shown on this chart as well as Cascade.

## Fire Fighting Preparedness Risk by Community and/or Sections
(completed by Green Mountain Falls/Chipita Park Volunteer Fire Department)

| Communities or Sections Outside of Populated Area | [1] Sufficient Access/Egress | [2] **Firefighting Water Resources** (Cisterns, streams, hydrants) | [3] Distance from Fire Department | [4] Community Land Area | [5] Community Topography | [6] Firefighters' Preparedness &Training | [7] Number of Firefighters in District | Risk Score | Relative Risk Rating |
|---|---|---|---|---|---|---|---|---|---|
| Cascade | | | | | | | | | |
| Chipita Park* | 3 | 1 | 1 | 2 | 3 | 2 | 1 | 13 | **Medium** |
| Green Mountain Falls | 3 | 1 | 1 | 2 | 3 | 2 | 1 | 13 | **Medium** |
| Section 1 | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 16 | **High** |
| Section 2 | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 16 | **High** |
| Section 3 | | | | | | | | | |
| Section 4 | | | | | | | | | |

Use this scale to complete the table.

[1] Yes = 1, No = 3 [2] 3 water sources = 1, 2 water sources = 2, 1 water source = 3 [3] <1 mi = 1, 1-2 mi = 2, >2 mi = 3 [4] Small = 1, Medium = 2, Large = 3 [5] Flat = 1, Moderate/Steep = 2, Very Steep = 3 [6] Highly Prepared = 1, Moderately Prepared = 2 [7] Adequate = 1, Less than Adequate = 3

Use this scale to complete the risk score and rating: 7–10 = Low, 11–15 = Medium, 16–20 = High

*Green Mountain Falls also serves homes in the western portion of Chipita Park, so Chipita Park is shown on this chart as well as Green Mountain Falls.

## Fire Fighting Preparedness Risk by Community and/or Sections
(completed by USDA, Forest Service)

| Communities or Sections Outside of Populated Area | [1] Sufficient Access/Egress | [2] Firefighting Water Resources (Cisterns, streams, hydrants) | [3] Distance from Fire Department | [4] Community Land Area | [5] Community Topography | [6] Firefighters' Preparedness &Training | [7] Number of Firefighters in District | Risk Score | Relative Risk Rating |
|---|---|---|---|---|---|---|---|---|---|
| Cascade | | | | | | | | | |
| Chipita Park | 3 | 1 | 1 | 2 | 3 | 2 | 1 | 13 | **Medium** |
| Green Mountain Falls | 3 | 1 | 1 | 2 | 3 | 2 | 1 | 13 | **Medium** |
| Section 1 | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 16 | **High** |
| Section 2 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | 15 | **High to Medium** |
| Section 3 | 3 | 3 | | | | | | 6 | **Low** |
| Section 4 | 3 | 3 | | | | | | 6 | **Low** |

Use this scale to complete the table.

[1] Yes = 1, No = 3 [2] 3 water sources = 1, 2 water sources = 2, 1 water source = 3 [3] <1 mi = 1, 1-2 mi = 2, >2 mi = 3 [4] Small = 1, Medium = 2, Large = 3 [5] Flat = 1, Moderate/Steep = 2, Very Steep = 3 [6] Highly Prepared = 1, Moderately Prepared = 2 [7] Adequate = 1, Less than Adequate = 3

Use this scale to complete the risk score and rating: 7–10 = Low, 11–15 = Medium, 16–20 = High

## Fire Fighting Preparedness Risk by Community and/or Sections
(completed by Colorado Springs Utilities)

| Communities or Sections Outside of Populated Area | [1] Sufficient Access/Egress | [2] Firefighting Water Resources (Cisterns, streams, hydrants) | [3] Distance from Fire Department | [4] Community Land Area | [5] Community Topography | [6] Firefighters' Preparedness &Training | [7] Number of Firefighters in District | Risk Score | Relative Risk Rating |
|---|---|---|---|---|---|---|---|---|---|
| Cascade | | | | | | | | | |
| Chipita Park | | | | | | | | | |
| Green Mountain Falls | | | | | | | | | |
| Section 1 | 1 | 1 | 3 | 3 | 2 | 1 | 1 | 12 | **Medium** |
| Section 2 | | | | | | | | | |
| Section 3 | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 14 | **Medium** |
| Section 4 | 3 | 3 | 2 | 3 | 3 | 1 | 1 | 16 | **High** |

Use this scale to complete the table.

[1] Yes = 1, No = 3 [2] 3 water sources = 1, 2 water sources = 2, 1 water source = 3 [3] <1 mi = 1, 1-2 mi = 2, >2 mi = 3 [4] Small = 1, Medium = 2, Large = 3 [5] Flat = 1, Moderate/Steep = 2, Very Steep = 3 [6] Highly Prepared = 1, Moderately Prepared = 2 [7] Adequate = 1, Less than Adequate = 3

Use this scale to complete the risk score and rating: 7–10 = Low, 11–15 = Medium, 16–20 = High

### Number of Fire-Related Calls by Fire District

| Year and Fire District | Smoke Reports | Car Fires | Structure Fires | Unattended Campfires | Wildland Fires | **Total** |
|---|---|---|---|---|---|---|
| Cascade | | | | | | |
| 2004 | 12 | 2 | 0 | 5 | 3 | 22 |
| 2005 | 14 | 1 | 0 | 4 | 2 | 21 |
| 2006 | 10 | 2 | 0 | 5 | 2 | 19 |
| **Total** | **36** | **5** | **0** | **14** | **7** | **62** |
| Green Mountain Falls/Chipita Park | | | | | | |
| 2004 | 5 | 4 | 13 | 1 | 11 | 34 |
| 2005 | 6 | 4 | 15 | 2 | 10 | 37 |
| 2006 | 6 | 2 | 9 | 4 | 17 | 38 |
| **Total** | **17** | **10** | **37** | **7** | **38** | **109** |

2. Cultural, Historical, and Ecological Values at Risk

In the pages that follow are several charts that list the various cultural, historical, and ecological values at risk in the communities within the CWPP boundaries.

**Cultural/Historical/Ecological Sites**
**Cascade**
**Risk Assessment**

| Historic/Cultural Sites | Potential Damage Due To Fire | Potential Damage Due To Fire Fighting | Overall Risk |
|---|---|---|---|
| Cascade Community Bldg. (Cascade Community Resorts, Inc.) | Stucco finish outside, with wood. Windows and woodwork inside. Landmark loss. Has fire alarm system. | Because of the age of this building, it would suffer substantial losses. High | **High** |
| Cascade Firehouse | Building of wood and some concrete work. Has upper level meeting space and fire equipment & trucks in lower level. Low danger. | If fire broke out without attention the building would burn quickly with lots of equipment loss. Water damage. | **Moderate** |
| Cascade Water Co. Bldg. | Older, stucco structure that is currently still in use. A landmark. | Would not burn quickly, however is small and would suffer water damage. | **Moderate** |
| Chapel of the Holy Rosary | Historic site of value. Stone work exterior, plaster interior with wood trim and art work of great value. Damage would be significant. | Smoke damage alone would cause irreparable damage with interior fire. Cost to repair would be high. | **High** |
| Colorado Midland Railroad ROW (now private property) | Surrounded by rock, brush, and some trees. On steep embankment. | Difficult for fire district to access. Likely to be a part of wildfire. | **High** |
| Lucky 4 Ranch | Grass and trees with wood structure on property. Fire could spread quickly. | If fire spreads quickly, it could present hot, fast burn that could make it difficult to contain. | **High** |
| Eastholme in the Rockies | Wood frame; three story; some balloon framing. Would burn quickly and completely. | Water damage would be significant. | **High** |
| Marigreen Pines<br><br>Mother's Rest Spring Gazebo | Landmark building and property. Stone exterior with varied interior of fire-resistant materials. With valued art. Surrounded by trees and grassy area. Lower house is wood frame and would burn quickly and completely. | Close to fire district so response time is quick. Any water damage to the interior could be serious. Difficult to contain fire. | **High** |

| | | | |
|---|---|---|---|
| North Pole | Many structures that are ignitable and infrastructure damage for recreation purposes. Would be hard to contain to single structure. | Very sloping terrain and not easy to navigate with equipment. Loss could be quick to the park and vegetation surroundings. | **High** |
| Ute Pass Library | Next door to fire district, however, not occupied on regular basis. Interior could burn quickly. | Close for response time. Easy access but water damage could be substantial. | **High** |
| **Ecological Sites** | | | |
| Cascade Creek | Surrounded by grass, brush, and trees. Ash problem if fire is nearby. | Access problem along the creek with banks and woods | **High** |
| Fountain Creek | Runs through the entire Ute Pass CWPP area and is surrounded by small brush, grasses, and trees. A major fire would cause serious damage to the creek. | Difficult to access if fire spreads quickly. However, runs in the canyon of the pass making it more accessible. | **High** |
| Heizer Trail<br>Mother's Rest Trail<br>Mt. Esther Trail<br>Pyramid Mtn. Trail<br>Ute Indian Trail<br>Waldo Canyon Trail | All of these trails have similar vegetation surrounding them: grasses, scrub oak, or other shrubs, and trees, all on very steep slopes. | Likely spots for fire to originate due to human causes or lightning. Could spread quickly and difficult to access. | **High** |
| Pikes Peak Highway | Burning vegetation would make it off limits and inaccessible. The potential for economic loss is high if the highway were closed or the scenery damaged due to a fire. | | **High** |

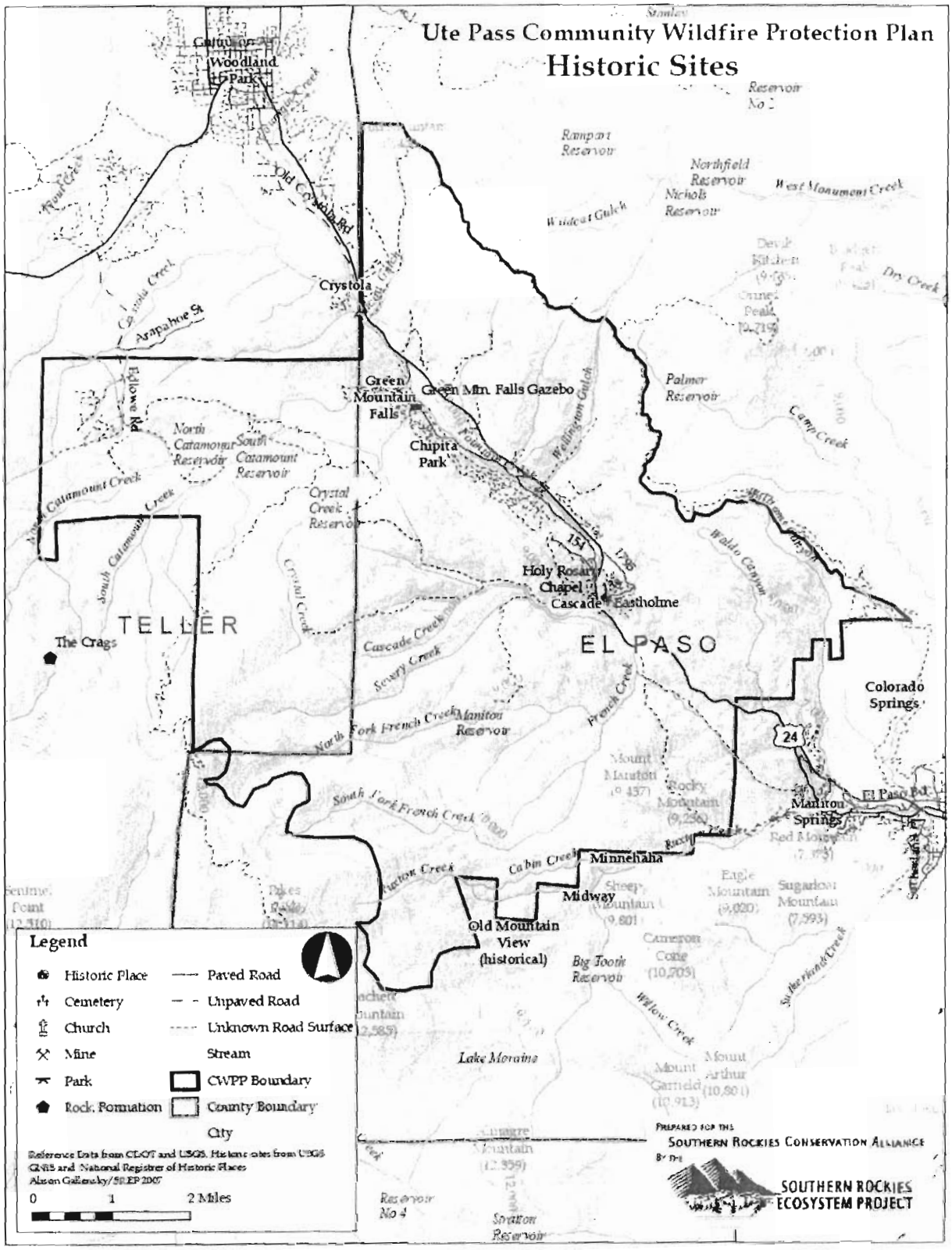
**Cultural/Historical/Ecological Sites**
**Green Mountain Falls**
**Risk Assessment**

| **Cultural/Historic/Ecological** | **Potential Damage Due to Fire** | **Potential Damage Due To Fire Fighting Activity** | **Overall Risk** |
|---|---|---|---|
| Water Storage Tank Built by City COS – Hondo Ave. | High; surrounded by old and very dense forest; narrow road. | Moderate | **Moderate** |
| Thomas Trail (runs above Hondo Ave.) Approx. 1.5 mi | High; no access; dense, old forest. | High | **High** |
| Catamount Trail (goes to North & South Catamount Reservoirs) 2 mi. | High; no access, dense, old forest. | High | **High** |
| Rocky Mountain Christian Church/School | Low; mostly metal frame; defensible space | High | **High** |
| Sallie Bush Community Building Built in 1950 | High; wooden structured; defensible space | High | **High** |
| Columbine Inn Built prior to 1920 | High; lots of dry wood decking with large potential for damage;defensible space. | High | **High** |
| Outlook Lodge Built in 1889 | High; wooden structure; defensible space. | High | **High** |
| GMF Municipal Pool Pool built in 1939 with | Low; block building; defensible space. | Low | **High** |

| | | | |
|---|---|---|---|
| bathhouse rebuilt in 2002 | | | |
| Church In the Wildwood<br>Built in 1889 | High, wooden structure;<br>defensible space. | High | **High** |
| Rocking K Corral<br>Upholstery Shop Built in<br>1920's | Low, block building;<br>sits next to Catamount<br>Creek. | High | **High** |
| U.S. Postal Service | Low, wood frame. Built<br>over Catamount Creek | High | **High** |
| Midland Rails Liquor | Low, wood frame. Built<br>next to Catamount Creek. | Low | **Moderate** |
| Town Hall Building<br>built in 1890 | High, old wood structure;<br>defensible space. | High | **High** |
| Marshal's Office | Low, block structure built<br>into hillside; defensible space. | High | **High** |
| Attached Structures in one<br>Building - Built in 1920's<br>Duckie's Confections<br>Mucky Duck Deli & Catering<br>Mr. "C's" Pizza<br>Pine Gables Tavern | High, old framed structure;<br>Fountain Creek in back;<br>defensible space. | High | **High** |
| Attached structures in one<br>Building – Built in 1930's<br>Urban Electronics/apt. in rear<br>Stones, Bones & Wood/apt. "<br>Pantry Restaurant<br>built in 1930's | High, old frame structure;<br>Fountain Creek in back;<br>defensible space. | High | **High** |
| Lakeside Cottages<br>built in 1940's | High, frame structures;<br>units close together. | High | **High** |
| Falls Motel<br>built in 1940's | High due to age, block<br>structure. Fountain Creek<br>directly in back. | High | **High** |
| Gazebo – this has a historic<br>Designation with the State<br>built in 1888 | High, wooden structure;<br>defensible space surrounded by<br>the lake. | High | **High** |
| Land Company Building<br>built in 1888 | High, old wooden structure. | High | **High** |
| Lake around the Gazebo | High – run-off would fill<br>the lake with mud. | High | **High** |
| Mountain Lake Children's<br>Center – built in 1940's | High, wooden structure;<br>defensible space. | High | **High** |

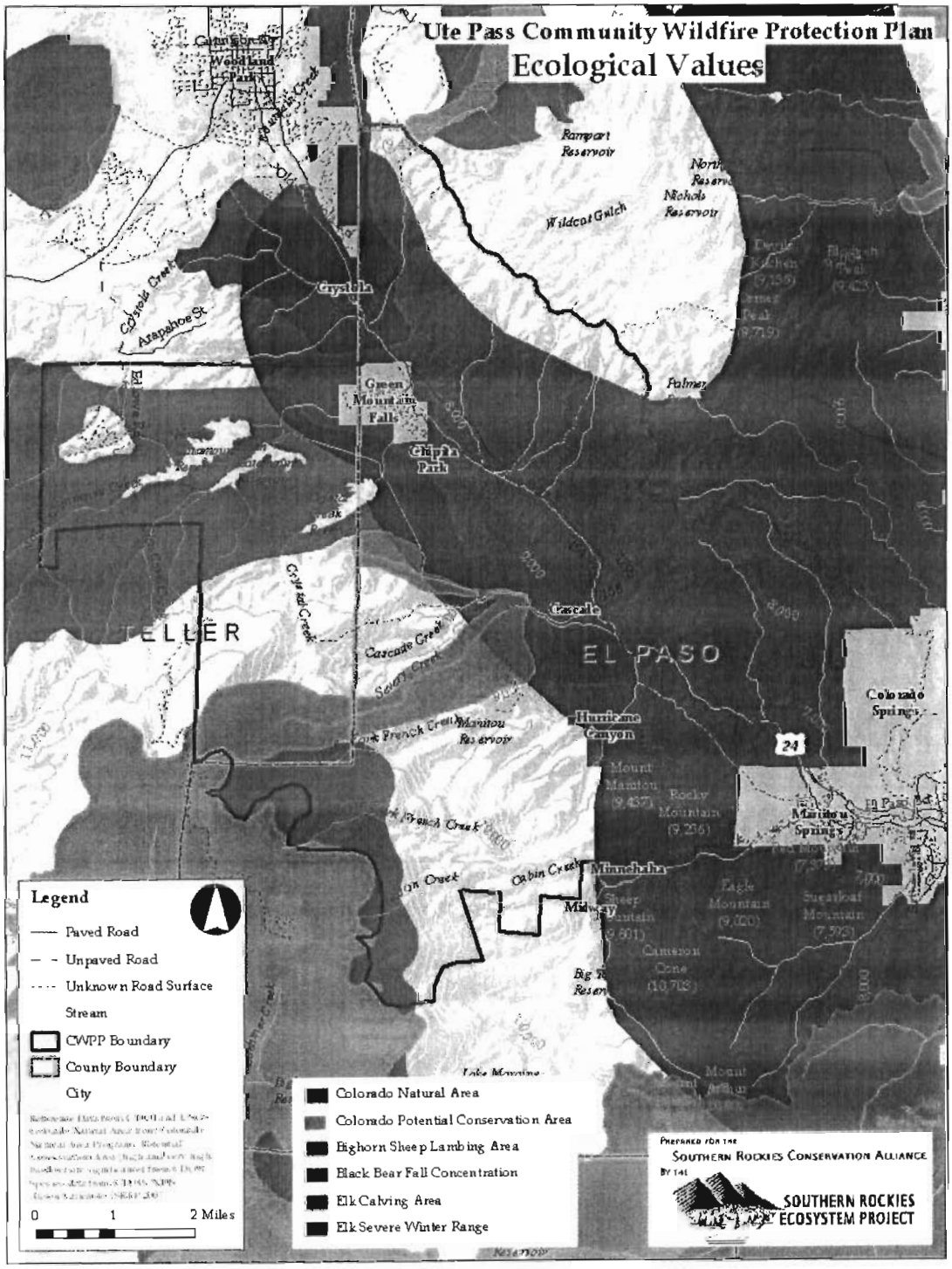
| | | | |
|---|---|---|---|
| Catamount Creek | High, dense vegetation, no access. Creek would be filled with debris. | High | **High** |
| Fountain Creek | High – dense vegetation; fire debris would fill and possibly dam up creek | High | **High** |
| Crystal Creek | High, dense vegetation; fire debris. | High | **High** |
| The Market | High, wood frame structure; defensible space. | High | **High** |
| Green Mountain Fall/Chipita Park Fire Department built in the 1950's | Low, block structure; defensible space; Catamount Creek in back. | Low | **Low** |
| Pikes Pub/Black Bear Restaurant –built in 1940's | High, old wooden structure; defensible space.. | High | **High** |
| Qwest Relay Station | Low, block building. | High | **High** |
| Creekside Motel built in 1930's | High, wood frame units; Catamount Creek in back; defensible space. | High | **High** |
| Green Mountain Falls Public Works Maintenance Bldg: built in 1985 1,500 gallons fuel on site | Low, block structure; defensible space. | High | **High** |
| Green Hills Motel built in 1930's | High, old units, close together, limited defensible space. | High | **High** |
| Ute Pass Trail – a link to America The Beautiful Trail And connects GMF to Ute Pass Elementary – 1 mile | High, surrounded by scrub oak and grasses. | High | **High** |
| Ute Pass Elementary School built in 1969 | Low, block structure; defensible space | High | **Moderate** |
| Chipita Lodge | Landmark building built of logs with wood interior. Fire would spread quickly. | Access to the building to extinguish fire could cause extensive damage. | **High** |
| Marcroft Hall | Wood structure with wood interior. Would burn quickly and fire would threaten nearby neighbors. | Potential loss of entire building because of hot fire. | **High** |
| Chipita Lake | Surrounded by mostly grass. Easy access for fire district. | Easy access for fire districts. Not difficult to contain. | **Moderate** |
| Brockhurst Ranch | Large, new stucco building on slope facing south. Low vegetation. | Significant water damage and potential for wildfire. | **High** |
| Lucky 4 Ranch | Large area with vegetation and host to campers. | Potential quick-burning fire in area and loss of campers. | **High** |

The map that follows on the next page shows the historic sites at risk within the CWPP boundaries.


Ute Pass Community Wildfire Protection Plan
Historic Sites
City of Woodland Park
Crystola
Green Mountain Falls
Green Mtn. Falls Gazebo
Chipita Park
Holy Rosary Chapel
Cascade
Eastholme
The Crags
TELLER
EL PASO
Colorado Springs
Manitou Springs
Minnehaha
Midway
Old Mountain View (historical)
Palmer Reservoir
Maniton Reservoir
Crystal Creek Reservoir
North Catamount Reservoir
South Catamount Reservoir
Lake Moraine
Legend
Historic Place
Cemetery
Church
Mine
Park
Rock Formation
Paved Road
Unpaved Road
Unknown Road Surface
Stream
CWPP Boundary
County Boundary
City
Reference Data from CDOT and USGS. Historic sites from USGS GNIS and National Register of Historic Places
Alison Gallensky/SREP 2007
0 1 2 Miles
Prepared for the
Southern Rockies Conservation Alliance
By the
Southern Rockies Ecosystem Project

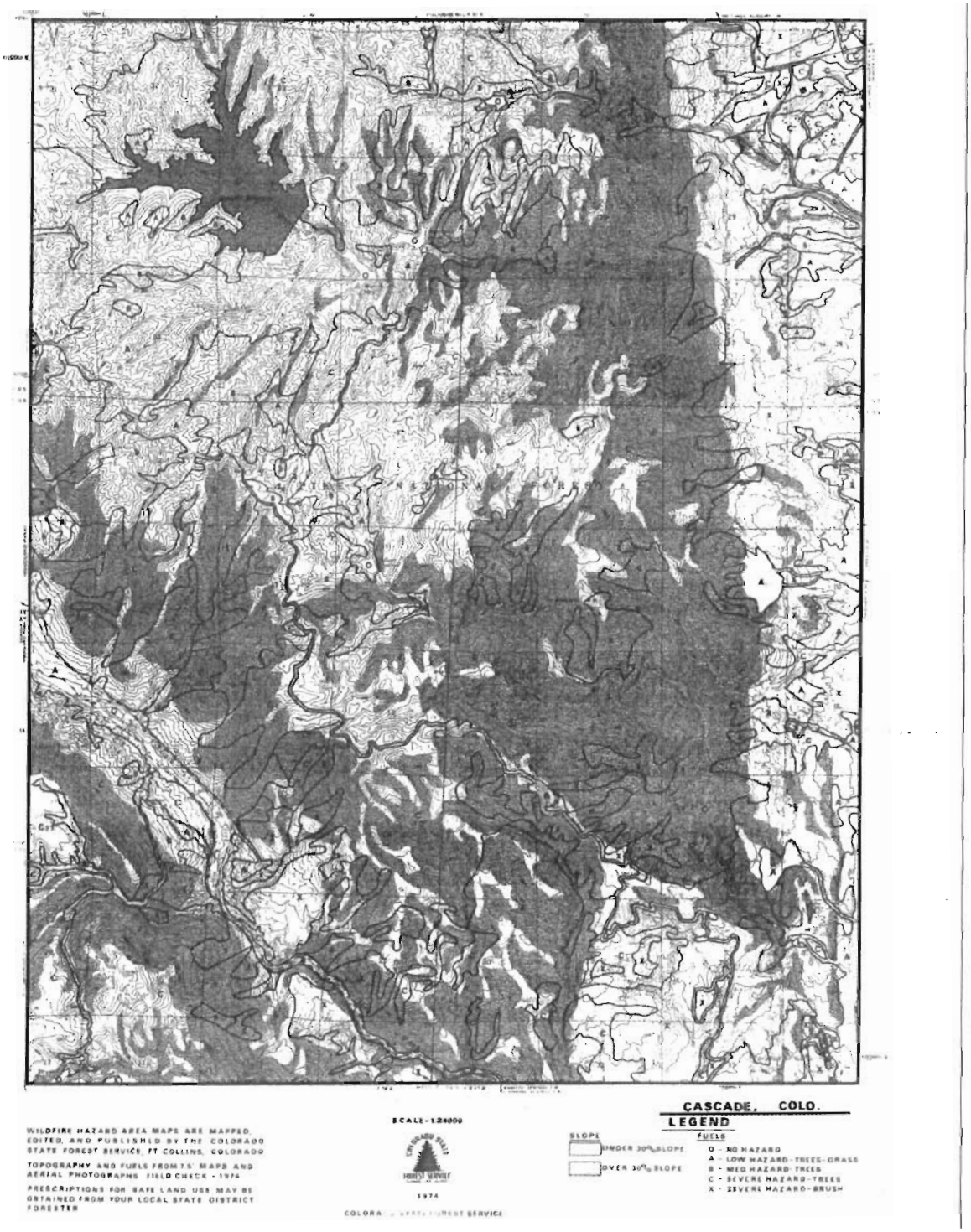
## C. Natural Values at Risk

The diversity of vegetation and topography within the plan boundaries, combined with large areas of undeveloped land, create an abundance of ecological resources. Committee members compiled sets of environmental assessment documents prepared by the following resource agencies and organizations: USDA Forest Service and Bureau of Land Management, Colorado Natural Heritage Program, Colorado Division of Wildlife, Colorado State Forest Service, and the Southern Rockies Conservation Alliance.

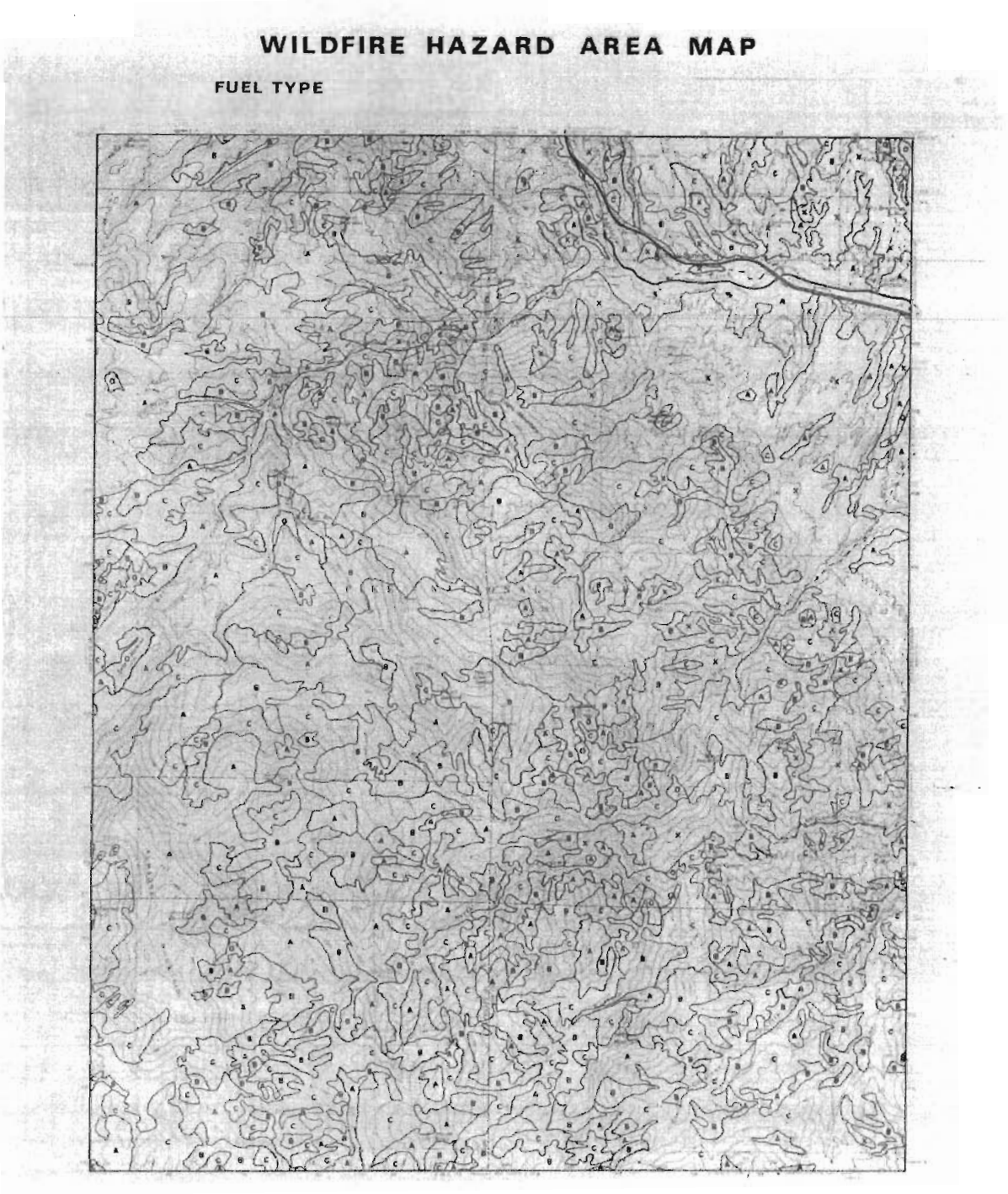


Wildfire Hazard Maps

Four Wildfire Hazard Maps Follow: Although the maps were compiled in 1974, the conditions on which they were developed—topography and vegetation—have not changed greatly in the intervening years. The most significant change is the increase in population and structures over the past three decades.



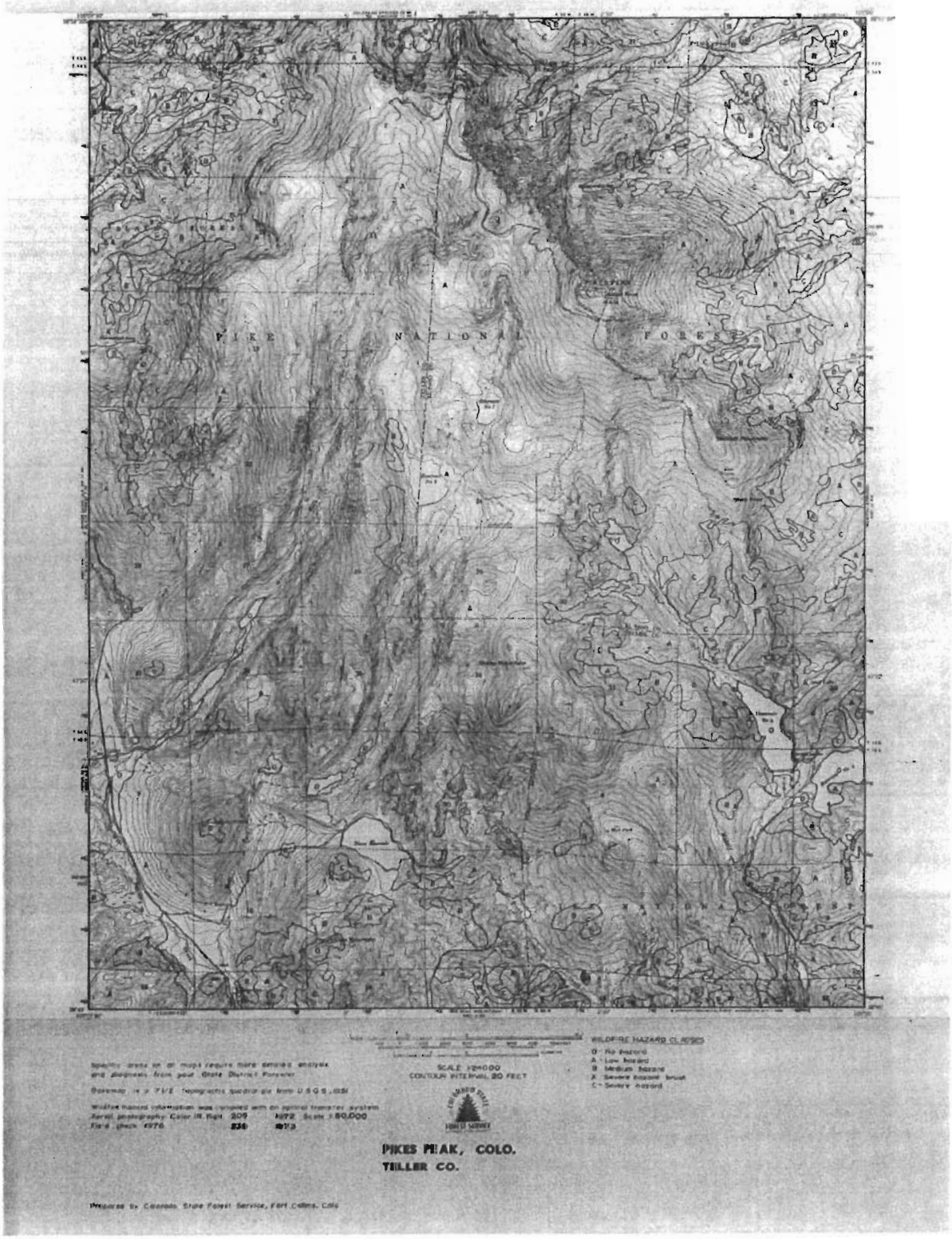
## Manitou




This map is a continuation of the Cascade Map and includes some of the Ute Pass CWPP boundaries within it. The legend would be the same as seen on the other three maps.

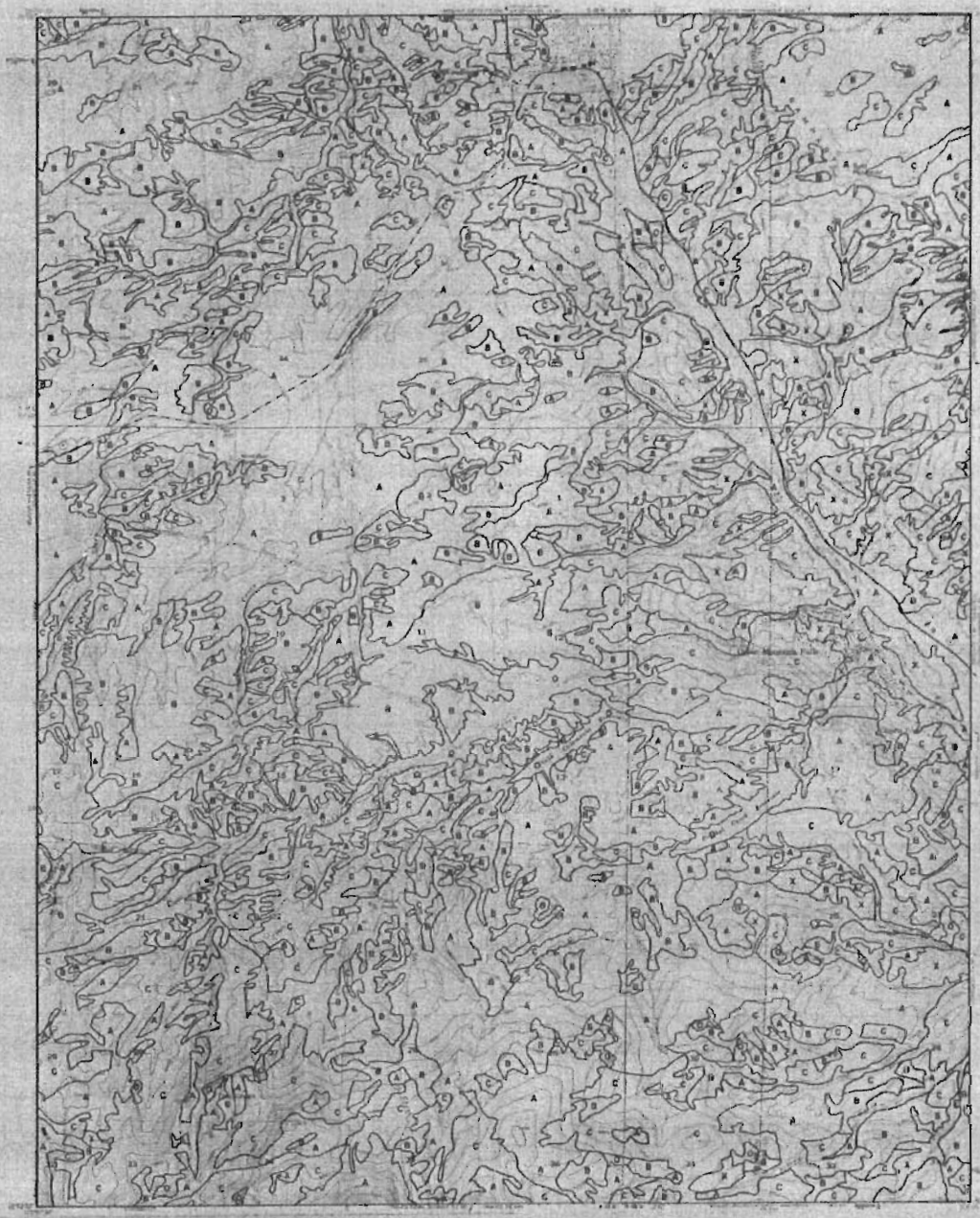
# WILDFIRE HAZARD AREA MAP

**FUEL TYPE**



# WILDFIRE HAZARD AREA MAP

**FUEL TYPE**



Specific areas on all maps require more detailed analysis and diagnosis from your State District Forester

Basemap is a 7 1/2 topographic quadrangle from U.S.G.S., 1964

Wildfire hazard information was compiled with an optical transfer system
Aerial photography: Color IR, flight 205 1972 Scale 1:50,000
Field check 1976 226 1973

SCALE 1:24000
CONTOUR INTERVAL 40 FEET

WILDFIRE HAZARD CLASSES
- A - No hazard
- B - Low hazard
- B - Medium hazard
- X - Severe hazard - brush
- C - Severe hazard

**WOODLAND PARK, COLO.**
**TELLER CO. / EL PASO CO.**

Prepared by Colorado State Forest Service, Fort Collins, Colo.

The documents that follow, supplied by the Southern Rockies Conservation Alliance, provide a view of the broad range of ecological resources that potentially are at risk to wildfire.

**Colorado Federal And State Protected Plants**
**Threatened & Endangered**
**USDA – Natural Resource Conservation Service**

| Symbol | Scientific Name | Common Name | Federal Protected Status |
|---|---|---|---|
| ASHU | *Astragalus humillimus* Gray | Mancos milkvetch | E |
| ASOS | *Astragalus osterhoutil* M.E. Jones | Kremmling milkvetch | E |
| ECFEF3 | *Echinocereus fendleri* (Engelm.) F. Seitz ssp. fendleri | pinkflower hedgehog cactus | E |
| ECFEK | *Echinocereus fendleri* (Engelm,) F. Seitz var. kuenzleri (Castetter, Pierce & Schwerin) L. Benson | pinkflower hedgehog cactus | E |
| ERPE10 | *Eriogonum pelinophilum* Reveal | | E |
| EUPE10 | *Eutrema penlandii* Rollins | Penland's eutrema | T |
| GANEC | *Gaura neomexicana* Woot. Ssp. *Coloradensis* (Rydb.) Raven & Gregory | Colorado butterfly plant | T |
| GANEC2 | *Gaura neomexicana* Woot. Var. *Coloradensis* (Rydb. Munz | Colorado butterfly plant | T |
| ILRIR | *Iliamna rivularis* (Dougl. Ex Hook.) Greene var. *rivularis* | streambank wild hollyhock | E |
| ILCO$ | *Iliamna corei* Sherff | streambank wild hollyhock | E |
| LECO10 | *Lesquerella congesta* Rollins | Dudley Bluffs bladderpod | T |
| PEKN2 | *Pediocactus knowltonii* L. Benson | Knowlton's miniature cactus | E |
| PEPE25 | *Penstemon penlandii* W.A. Weber | Penland's beardtongue | E |
| PHF02 | *Phacelia formosula* Osterhout | Northpark Phacelia | E |
| PHOB | *Phsyaria obcordata* Rollins | Dudley Bluffs twinpod | T |
| SCGL3 | *Sclerocactus glaucus* (J.A. Purpus ex K. Schum.) L. Benson | Uinta Basis hookless cactus | T |
| SCME4 | *Sclerocactus mesae-verdae* (Boissevain & C. Davids. Ex Marshall & Bock) L. Benson | Mesa Verde fishhook cactus | T |
| SPD16 | *Spiranthes diluvialis* Sheviak | Ute lady's tresses | T |

| Code | Protected Status |
|---|---|
| E | Endangered |
| T | Threatened |

UTE PASS CWPP
Sensitive and Rare Plant Species
(USDA Forest Service, BLM, CO NATURAL HERITAGE PROGRAM)

| Common Name (G) = Global name (S) = State name | Species Name | Typical Habitat | State Rank |
|---|---|---|---|
| American Yellow Lady's-Slipper | *Cypripediuin calceolus ssp. parviflorum* | Flowers June–July; Habitat: Aspen groves and ponderosa pine/Douglas-fir forests. Elev. 7,400–8,500 ft | Imperiled |
| Small-headed Rush | *Juncus brachycephalus* | Calcareous marshes, wet meadows, and wetland shores | Critically imperiled |
| Rattlesnake Fern | *Botrypus virginianus ssp. Europaeus .* | June–July; Habitat: Springs and moist areas in cool ravines. Elev. 6,000–9,500 ft. | Critically imperiled |
| Least Grape-fern (G) Least Moonwort (S) | *Botrychium simplex* | Dry fields, marshes, bogs, swamps, roadside ditches | Critically imperiled |
| A Sedge | *Carex oreocharis* | Meadow tundra | Critically imperiled |
| Reflected Moonwort | *Botrychium echo* | July; Habitat: Gravelly soils, rocky hillsides, grassy slopes, and meadows. Elev. 9,500–11,000 ft. | Rare or uncommon |
| Torrey Sedge | *Carex torreyi* | Meadows, moist woods 200–2,500 m | Critically imperiled |
| Plummer Woodsia (G) Plummer's Cliff Fern (S) | *Woodsia plummerae* | Cliffs and rocky slopes; usually on granite or volcanic substrates; 700–3,100 m | Unrankable; status not confirmable |
| Bristly-stalk sedge | *Carex leptalea* | June–August; Habitat: Rich fens; graminoid dominated mineral rich wetlands. Elev. 9,000–10,000 ft. | Critically imperiled |
| Golden Columbine | *Aquilegia chrysantha var. rydbergii* | Flowers June; Habitat: In mountains, especially along streams or in rocky ravines. Elev. 5,500–6,000 ft. | Critically imperiled |
| Purple-stem Cliff-brake (G) Purple Cliff-brake (S) | *Pellaea atropurpurea* | July–September; Habitat: Dry shaded ledges and crevices of limestone, sandstone, and basalt. Elev. 4,000–7,200 ft. | Imperiled to rare & uncommon |
| Arkansas Valley Evening Primrose | *Oenothera harringtonii* | Mid May–June; Habitat: Compacted silty clays to looser rocky & sandy soils in open grasslands. Elev. 4,700–6,100 ft. | Imperiled |

| | | | |
|---|---|---|---|
| Rocky Mountain Columbine | *Aquilegia saximontana* | July–August; Habitat: Cliffs and rocky slopes, subalpine and alpine. Elev. 9,000–12,300 ft. | Rare or uncommon |
| White Adder's Mouth | *Malaxis monophyllos ssp, Brachypoda* | July–August; Habitat: Shaded streamsides, mossy wet areas. Elev. 7,200–8,000 ft. | Critically imperiled |
| Western Moonwort | *Botrychium hesperium* | Leaves appear mid spring. Grassy mountain slopes, snowfields, road ditches with willows; and sand dunes; 200–2,800 m | Imperiled |
| Narrowleaf Grapefern | *Botrychium lineare* | Spores in June; Habitat: Grassy slopes, among medium-height grasses, along edges of streamside forests. Elev. 7,900–9,500 ft. | Critically imperiled |
| Pale Moonwort | *Botrychium pallidum* | July–August; Habitat: Open exposed hillsides, burned or cleared areas, old mining sites. Elev. 9,800–10,600 ft. | Imperiled |
| Xeric Tallgrass Prairie Big & Little Bluestem | *Andropogon gerardii-schizachyrium scoparium* | Big Bluestem found on moist prairie sites; Little Bluestem found on fertile slit and clay loam soils of lowlands. | Imperiled |
| Eaton's Lip Fern | *Cheilanthes eatonii* | Sporulating summer–fall. Rocky slopes and ledges, found on a variety of substrates incl. limestone and granite; 300–3,000 m | Imperiled |
| James False Saxifrage (G) James Telesonix (S) | *Telesonix Jamesii* | Endemic saxifrage; boulder fields, cliff faces, and rocky outcrops in tundra & mixed conifer forest communities; 6,800–13,600 ft. | Imperiled |
| Clawless Draba | *Draba exunguiculata* | Flowering/Fruiting Period: Late June–July/early August. Rocky, gravelly slopes and talus; fellfields; usually granitic bedrock. Elev. 12,000–14,000 ft. | Imperiled |
| Pikes Peak Spring Parsley | *Oreoxis humilis* | Flowering/Fruiting period: June–August. Habitat: Granitic substrate above timberline. Elev. 12,000–13,000 ft. | Critically Imperiled |
| Alpine Bluebells | *Mertensia alpina* | Four or five inches high, found at or above treeline. | Critically Imperiled |

**UTE PASS CWPP**
**Sensitive and Rare Bird Species**
**(Center for Biological Diversity, CO Natural Heritage Program, Audubon, USFWS)**

| Common Name (G) = Global Name (S) = State Name | Species Name | Typical Habitat | State Rank |
|---|---|---|---|
| Grace's Warbler | *Dendroica graciae* | Locally common in open mixed pine-oak woodlands above 7,000 ft. Summer in the southwestern United States and northern Mexico andmigrate to Central America for winter. | Rare or uncommon in breedingstatus |
| Ovenbird | *Seiurus aurocapillus* | Breeds in mature deciduous and mixed deciduous and coniferous forests. Mostly migrating through CO. Winters in primary and second-growth forests. | Imperiled, especially in breeding |
| Mountain Plover | *Charadrius montanus* | Breeds on open plains at moderate elevations. Winters in short-grass plains and fields, plowed fields, and sandy deserts. | Imperiled, especially in breeding |
| Mexican Spotted Owl | *Strix occidentalis lucida* | Forested mountains and canyons in pockets of high-elevation forest with mature trees that create high, closed canopies good for nesting. They nest in stick nests built by other birds, tree cavities, caves, and on cliff ledges. | Critically Imperiled; considered unrankable in terms of breeding. Ute Pass area is in USFWS officially-designated Critical Habitat |

## UTE PASS CWPP
## Sensitive and Rare Mammal Species
## (Center for Biological Diversity, CO Div. of Wildlife, USFWS)

| Common Name (G) = Global Name US = State Name | Species Name | Typical Habitat | State Rank |
|---|---|---|---|
| Pale Lump-nosed Bat (G) Townsend's Big-eared Bat subsp. (S) | *Plecotus townsendii pallescens* | Semi-desert shrublands, pinon-juniper woodlands, and open montane forests to elevations of about 9,500 ft.<br><br>Diet: Caddisf lies appear to be a staple of the diet, which also includes moths, flies, and other insects. | Imperiled |
| Black-footed Ferret | *Mustela nigripes* | Shortgrass and midgrass prairie to semidesert shrublands. No live ferrets have been found, although evidence suggests they inhabit Colorado.<br><br>Diet: prairie dogs, mice, ground squirrels, rabbits, birds, reptiles, and insects. | Critically imperiled<br><br>Federally Endangered Presently known to exist only in a remnant restored population In the Shirley Basin of Wyoming and in captive brooding populations. |
| Preble's Meadow Jumping Mouse | *Zapus hudsonius preblei* | Rivers/Streams/Shoreline | Critically imperiled Federal: Threatened |

## UTE PASS CWPP
## Sensitive and Rare Fish Species
## (CO Div. of Wildlife, USFWS)

| Common Name (G) = Global Name (S) = State Name | Species Name | Typical Habitat | State Rank |
|---|---|---|---|
| Greenback Cutthroat Trout | *Oncorhynchus Clarki stomias* | cold, clear, gravely headwater streams and mountain lakes which provide an abundant food supply of insects.<br><br>Diet: Crustaceans, such as fresh-water shrimp, aquatic and terrestrial insects, and small fish. | Imperiled<br><br>Federal: Threatened |

**Endangered Species and Facts**
(provided by Southern Rockies Conservation Alliance)

Kit Fox

Kit fox are one of our region's most endangered animals. Reduced to only about 100 individuals in Colorado, they continue to decline across their range because of development and agricultural conversion, drought, and poor management of sagebrush ecosystems.

Northern Leopard Frog

Like most amphibian species in North America, the northern leopard frog is suffering from the effects of habitat loss, pollution, and disease. Its populations across the western U.S. have declined drastically. The now-famous amphibian problem of malformations—deformed limbs and other body parts—is showing up in northern leopard frog populations as well.

Preble's Meadow Jumping Mouse

The Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is a shy, tiny rodent with a body approximately three inches long, and a roughly six-inch long tail. This species has large hind feet, long hind legs, and is capable of impressive athletic feats. Using its long tail as a rudder, a Preble's meadow jumping mouse can launch itself 18 inches into the air and switch direction mid-flight. It can travel three feet in a single jump, and can also swim. The mouse has a distinct dark, broad stripe on its back that runs from head to tail and is bordered on either side by gray to orange-brown fur. This shy, largely nocturnal mouse spends most of its time out of sight, foraging beneath long grasses for seeds, fruit, fungi, and insects.

Biologists believe that the species arrived in Colorado and Wyoming during the last ice age and remained after the glaciers receded. In the drier post-glacial climate, the mouse was confined to riparian ecosystems where moisture was more plentiful. Its range now stretches from the foothills of southeastern Wyoming southward along the eastern edge of the Front Range to Colorado Springs.

Widespread habitat loss and fragmentation due to development, water diversions, and gravel and sand mining have resulted in a rapid decline in Preble's populations. These threats continue to increase due to rapid residential, commercial, agricultural, and industrial development within nearly all of the mouse's range. These threats led to federal listing of the mouse as Threatened in May of 1998.

The Center for Native Ecosystems (CNE) is working to see that the Endangered Species Act protections for the Preble's meadow jumping mouse are enforced and that adequate Critical Habitat is designated. In addition, we are working to protect the wildlife values of the proposed Rocky Flats National Wildlife Refuge, which the mouse inhabits.

## VI. Implementation and Monitoring Plan

The implementation plan addresses the primary goals of a community plan to include fuel reduction, reducing structural ignitability, and improving emergency preparedness.

We started to address these goals during the summer of 2007. We developed a grant funded by the State of Colorado with in-kind matching to accomplish three projects.

- Community chipping project. Area developer, P. J. Anderson, donated a chipper for use on the chipping project. The grant funded a person, along with volunteers, to pull the chipper from property-to-property and chip branches on the homeowner's property. Homeowners were given a mulch handout to show how to use the mulch. This project ran for two weeks and cleaned up fuel on approximately twenty-seven acres.
- One demonstration site was selected where the homeowner had extensive thinning and fuel removal. The site is highly visible and the owner is very open to others coming to view their property for ideas on creating defensible space to reduce structural ignitability. We are hoping that this site motivates others to examine defensible space around their homes.
- We have selected a five-acre fuel break that is located on private property and is directed at assisting with fire mitigation should a wildfire come up Ute Pass and threaten property on the north-facing slopes of the local communities. This fuel break will be completed in August 2007.

In addition, the CWPP held an informational forum and discussion of the proposed Ute Pass CWPP for residents of the three communities in June 2007. This will become an annual event held with a pancake breakfast. Resource people were present to discuss issues with homeowners.

The committee is confident that great strides have been made in accomplishing the goals established during the planning process and that the people of the area are responding positively. Part of the committee process was to establish a five-year plan that follows on the next page. This plan will be reviewed annually as indicated by the monitoring schedule.

## A. Ute Pass CWPP Five-Year Timeline

| | **Fuel Reduction** | **Reduce Structural Ignitability** | **Improve Emergency Preparedness** |
|---|---|---|---|
| **Year One** | 1) CWPP, Fire Districts, Forest Services plan fuel break on Rampart Range.<br>2) Write grants for community projects.<br>3) Plan for mulch site. | 1) Plan information fair & training around creating defensible space (**10%** of homeowner involvement in the first year).<br>2) April, May, or June. Have a checklist and reporting mechanism for homeowners.<br>3) Homeowners plan for inverse callback.<br>4) Write grants. | 1) Fire Districts assess needs with CWPP Committee. Review project needs.<br>2) Develop grants.<br>3) Evacuation plans written for all community members.<br>Feb. work session. |
| **Year Two** | 1) CWPP, Fire Districts, Forest Services plan fuel break along Pikes Peak Highway. (Cross-boundary with public/private)<br>2) Write grants for community projects.<br>3) Plan for mulch site. | 1) Plan information fair & training around creating defensible space (**2%** involvement over previous year) in the spring.<br>(2) April, May, or June. Have a checklist and reporting mechanism for homeowners.<br>3) Write grants. | 1) Fire Districts assess needs with CWPP Committee. Review project needs. Feb.<br>2) Develop grants as available. |
| **Sept., 2009 First Monday** | End of year review. → | CWPP Committee, Fire Districts, USDA Forest Service, CO State Forest Service, County Environmental Services | Review, revise plan. |
| **Year Three** | 1) CWPP, Fire Districts, Forest Services plan fuel breaks where necessary. Clean previous fuel break acres.<br>2) Write grants for community projects.<br>3) Plan for mulch site. | 1) Plan information fair & training around creating defensible space (**2%** involvement over previous year in the spring).<br>2) April, May, or June. Have a checklist and reporting mechanism for homeowners.<br>3) Write grants. | 1) Fire Districts assess needs with CWPP Committee. Review project needs. Feb.<br>2) Develop grants as available. |

| (Con't) | Fuel Reduction | Reduce Structural Ignitability | Improve Emergency Preparedness |
|---|---|---|---|
| **Sept., 2010 First Monday** | End of year review. → | CWPP Committee, Fire Districts, USDA Forest Service, CO State Forest Service, County Environmental Services | Review, revise plan. |
| **Year Four** | 1) CWPP, Fire Districts, Forest Services plan fuel breaks where necessary. Clean previous fuel break acres.<br>2) Write grants for community projects.<br>3) Plan for mulch site. | 1) Plan information fair & training around creating defensible space (**2%** involvement over previous year in the spring).<br>2) April, May, or June. Have a checklist and reporting mechanism for homeowners.<br>3) Write grants. | 1) Fire Districts assess needs with CWPP Committee. Review project needs. Feb.<br>2) Develop grants as available. |
| **Sept., 2011 First Monday** | End of year review → | CWPP Committee, Fire Districts, USDA Forest Service, CO State Forest Service, County Environmental Services | Review, revise plan. |
| **Year Five** | 1) CWPP, Fire Districts, Forest Services plan fuel breaks where necessary. Clean previous fuel break acres.<br>2) Write grants for community projects.<br>3) Plan for mulch site. | 1) Plan information fair & training around creating defensible space (**2%** involvement over previous year in the spring).<br>2) April, May, or June. Have a checklist and reporting mechanism for homeowners.<br>3) Write grants. | 1) Fire Districts assess needs with CWPP Committee. Review project needs. Feb.<br>2) Develop grants as available. |
| **Sept., 2012 First Monday** | End of year review → | CWPP Committee, Fire Districts, USDA Forest Service, CO State Forest Service, County Environmental Services | Review, revise plan. |

## B. Fuels Mitigation Strategies and Treatment Options

Strategies

There are three broad components to mitigating the risk of wildfire impacts. The first is prevention, which applies only to human-caused fires and is not the focus of this section. The second is defensibility of the structures themselves. This includes how structures are built, access, and defensible space. This is also not the subject of this section.

The focus of this section is modification of fuel beds to alter the behavior of fires. This may be directly adjacent to structures or across large tracts of wildlands. Generally, this involves changing potential fire behavior from high intensity to a lower intensity that is more conducive to control actions. It normally does not do away with fire, only changes it. It could, however, include eliminating fire behavior, such as paving or clearing all vegetation around a structure, or eliminating all burnable vegetation and replacing it with less flammable vegetation.

General Treatment Objectives

The objective of fuels mitigation treatments is to alter one or more components of the existing fuel bed enough to create the type of fire behavior that is acceptable or desired. There are four main components that can be altered: fuel moistures, arrangements, loading, and continuity. There are three main parts of the fuel bed: surface, ladders, and crowns.

Changing fuel moistures is not normally practical, except watering grass vegetation around homes to keep it green and less flammable. Most people have well water rights that do not allow for watering.

Most fuels treatments focus on the remaining components. These include reducing the continuity, such as thinning trees, eliminating trees from specified areas altogether, or removing large portions of brush or shrub fields, removing ladder fuels such as smaller trees and shrubs, and/or removing down dead material. All can alter fire behavior, while still maintaining other objectives, such as aesthetics, wildlife habitat, or landscaping needs.

Treatment Methods

There are only two basic ways to alter fuels, either by controlled burning, mechanical treatments, or a combination of both.

Mechanical

Mechanical treatment of fuels changes the structure of the fuel bed. There are many treatments, but they usually involve thinning of trees or shrub/brush fields, removal of ladder fuels, and/or altering surface fuels. The objective is to prevent crown fires in trees or brush fields, and/or reduce the intensity of surface fires.

Treatment by mechanical means is normally done by one of two broad methods: (1) mechanically removing the material for use as a product, or (2) mechanically altering the material for later removal or other treatment. Mechanical methods must be followed up by removal of the residue or slash created, or by changing that residue to a different form. Otherwise, the only accomplishment will be to change one type of high intensity fire to another form, often worse than the original situation.

The following are typical mechanical treatments:

*Thinning*

This is the use of handsaws, power saws, or heavy mechanized equipment to reduce the density of, primarily, conifer forests. The objective is to create openings in the forest canopy to reduce the

potential of high intensity crown-to-crown fire. It can be done across large acreages or in backyards. The acceptable level of risk and other objectives determines the amount of thinning.

It is normally implemented with a secondary objective of producing or salvaging some level of product, such as firewood. Forest residue or slash will be produced and needs to be treated.

*Mastication*
Mastication is used to thin conifer trees, reduce or eliminate brush or shrub fields, eliminate ladder fuels, and/or change surface fuels such as large down logs. Specially designed equipment is used to chew up trees, brush, or dead wood. It is very effective in brush, shrubs, and trees, and is a thinning method when there is no value to the trees (which is often the case here in Colorado). The size of the material left depends on the type of equipment used. Sizes range from chips to chunks of logs.

*Pruning*
Pruning is removal of lower branches to reduce the potential for fire to spread into the tree crowns. It is more common as a follow up treatment, after thinning, to prevent or reduce the likelihood of the remaining trees from "torching" and being killed, or throwing burning embers onto to nearby structures. It is also used to prepare areas for broadcast burning.

*Slash treatments*
Slash treatments may be needed to clean up the residue from the primary mechanical treatments. These fall into two categories: (1) removal of all slash, or (2) alter the slash to reduce intensity. Removal is primarily accomplished by prescribed burning, and will be discussed further below. However, chipping and removal can also be utilized.

The other secondary treatments consist mostly of lowering the height of the remaining material and changing its size to smaller pieces. This reduces the intensity of any fire that occurs and speeds up decomposition.

Both removal and alteration are also used, at times, to prepare areas for controlled burning. It can reduce the risk and the amount of smoke produced.

*Lop and Scatter*
This treatment consists of using saws or equipment to cut the slash into smaller pieces so that the height of the remaining slash is reduced, usually 12 inches or less. It may be the only practical treatment in areas where chippers are unavailable, prohibitively expensive, or in inaccessible locations. It is usually the lowest cost treatment since no special equipment, other than a chainsaw, is required.

The treated slash is left to decompose or can be broadcast burned. Over the course of several winters, snow pack pushes the slash down and it decomposes. Decomposition usually requires three to five years or longer if larger material was present. It is the most aesthetically unappealing method since the slash remains visible until it breaks down. It also creates an extremely flammable fuel bed until it decomposes, which can be easily ignited, and burns with high intensities. It should not be used adjacent to high values, such as homes, or areas prone to regular fire occurrence.

Lopped and scattered slash can also lead to problems with *ips* beetles. The beetles may lay eggs in green slash and the brood may emerge to attack living trees. This problem can be alleviated by doing any forest restoration treatments requiring this method in the fall and winter when ips are not active and by cutting slash into small pieces that dry out quickly.

*Chipping*
Chipping is the grinding up of the slash into small pieces, usually less than a few inches in diameter. Material can be chipped and left, or removed for off-site disposal or as a product.

It requires mechanized equipment to perform the chipping. The slash must be brought to the chipper, unless it is an expensive mobile chipping piece of equipment. Either way, it can quickly become a very expensive operation.

Chipping is a common method of slash disposal in the defensible zones around structures. Chips do not significantly contribute to fire hazard around structures since they produce low intensity fire behavior. Large piles of chips should be avoided as they could smolder for a significant amount of time, however. Chips should be spread along the ground to a depth of less than four inches.

Chipping is an effective means of treating wood infested with bark beetles since the insects will not survive in the small bits of wood. Green slash that is promptly chipped will not harbor infestations of *ips* or other bark beetles. Chips also can pull nitrogen out of the soil, reducing the productivity of the ground.

*Trampling, Crushing, or Roller Chopping*
This is using heavy equipment, usually a dozer, to run over the slash, breaking it down in both size and height. It can be done with just the tracks or by also pulling a heavy, water filled drum with cutting blades welded onto it.

It is very effective and can also crush and break up heavy fuels such as down logs. However, the slash must dry, usually for several seasons, to make this treatment truly effective. There is an increased fire hazard in the interim.

There is an additional benefit to crushing or trampling. The material is not only broken down, but also driven into the soil. This can add nutrients to the soil faster, create small pockets in the soil surface for holding water, and decrease the potential for erosion.

*Piling*
This is the use of mechanized equipment, or by hand, of placing the residue or slash into piles for later disposal by burning. This will be discussed in more detail below under burning.

Burning
This is the use of controlled burning, either broadcast (over an entire area) or pile, done under specific conditions, as either a primary or secondary fuels treatment. Broadcast burning can be utilized by itself to thin, remove forest or brush fuels, reduce ladder fuels, and/or reduce surface fuels such as litter, duff, and down dead woody material.

Pile burning is normally utilized as a secondary treatment to remove slash residue, either as a final stand-alone treatment, or to prepare for broadcast burning.

*Pile Burning*
Any form of open burning requires a permit, and burning must be done only under the conditions stipulated in the permit. Local fire districts normally issue information and permits. Public land burning, as well as some private land burning, is regulated through the State Air Pollution Control Board, and requires a smoke permit.

Piles can be constructed with equipment or by hand. Piling with heavy equipment should only be done with a brush rake and not a regular blade. Piling with a regular blade will include significant amount of dirt, which will make the pile harder to burn, create more smoldering and smoke, and will hold heat longer, adding to the risk of an escape at a later date.

For most landowners the slash is piled by hand and burned when conditions are safe—usually several inches of snow on the ground that will persist for a couple days. This will depend on what type of material is contained in the pile. Material greater than five inches will take longer to burn and will hold heat for more time. Piles burn best when they are relatively compact, contain material less than one inch in diameter, and the height is greater than the diameter. This arrangement promotes hotter burning and less smoke.

It is important that burn piles not be located directly adjacent to or under the canopy of trees or other flammable material. Separation should be greater on the downwind side. It is easy to scorch living trees from the heat of the burning pile, even in winter. Avoid making burn piles on top of stumps. Stumps will hold heat for extended periods of time.

Often piles must sit through the summer in order to dry, or piles from one season may be left over the next summer if proper burning conditions were not available during the winter. In each case the dry woodpiles will sit through a burning season with the risk of ignition.

The fire should be monitored during the day and for several days thereafter. The center of a pile usually burns completely, but often wood around the edges does not. To ensure that the slash at the edge of each pile burns, it is necessary to "chunk in" the piles periodically. This means that as the fire at the middle of the pile burns down, wood from the edges should be thrown into the center to insure complete burning of all slash.

The ash pile must be monitored and may need to be cooled below the point of combustion, which is a process called "mopping up." This is especially important on south and west slopes where the snow melts off quickly and may be followed by dry windy weather.

For several years after a pile is burnt, an unsightly black ring remains where the heat of the fire scorched the soil. Many landowners find these unpleasant to look at. They may also present an opportunity for noxious weeds to colonize the bare soil. Breaking up the burned soil with a rake and reseeding with native plants is recommended.

*Broadcast Burning*

This method is more often used by federal or state land management agencies, than by private landowners. Private landowners, interested in broadcast burning, should contact a knowledgeable consultant or the Colorado State Forest Service, since there are numerous legal issues. A great deal of expertise is required to carry out the burn.

Broadcast burning can be a "stand alone" treatment for fuels mitigation, or the final step following mechanical treatments and even pile burning. It is an effective method for reducing surface fuels, reducing the density of shrubs, and reducing ladder fuels. It can also be used to thin larger trees, but it obviously can't be done with the precision of mechanical treatments. It is more effective in thinning the smaller trees and in patches or groups of trees.

Land management agency burns require a burn plan. The burn plan is an extensive legal document that describes the conditions under which the burn may be carried out, the organization required, and all the other activities that must be done. There is also a closely monitored smoke permit process with the State of Colorado that must be followed.

Broadcast burning can also be used to accomplish other objectives, such as regenerating decadent grass and shrubs, providing a seedbed for new trees, and many other items. There are also limits on its effectiveness for fuels treatments. Sites may be so dense or contain so much down dead material that a burn might kill everything. Certain species, like spruce and lodgepole pine, can

easily be killed, even with light under-burning, since these species naturally burn in high intensity fires that kill almost all the trees. Burned sites also have to be monitored for other problems, such as undesirable noxious weeds, *ips* beetles, or other issues.

## C. Fire Hazard Reduction Treatments

The treatments described here are those commonly used by landowners. Fire hazard reduction should complement other forest management objectives. Other forest treatments exist and may be used in unusual circumstances. Landowners are advised to consult a qualified forester before beginning a forest management program.

| | Species | | | | |
|---|---|---|---|---|---|
| Treatment | Ponderosa | Mixed Conifer | Lodgepole | Spruce/fir | Cost range[1] |
| Thin from below: | Most common method | Favor ponderosa pine over D-fir | Restricted by lack of wind firmness in LPP | Restricted by lack of wind firmness in S/F | |
| Chainsaw & hand crew | Usually highest cost. May be only possible method in difficult terrain | Usually highest cost. May be only possible method in difficult terrain | Usually highest cost. May be only possible method in difficult terrain | Usually highest cost. May be only possible method in difficult terrain | $0 to 2,500.00/ acre. |
| Masticating Machines | Practical method in PP since stand can be opened without wind throw. May be impractical in rocky terrain. Slash reduction usually included in treatment. | Practical method in PDF since stand can be opened without wind throw. May be impractical in rocky terrain. Slash reduction usually included in treatment. | May be impractical if machines cannot maneuver through trees. May be impractical in rocky terrain. Slash reduction usually included in treatment. | May be impractical if machines cannot maneuver through trees. May be impractical in rocky terrain. Slash reduction usually included in treatment. | $300 to 2,000 per acre. Varies with size of material removed and terrain. |
| Patch cuts | Usually objectionable to landowners. May achieve other forest management goals especially DMT control. Size of patch may be a few trees to several acres. | Usually objectionable to landowners. May not be necessary for DMT in mixed PP, D-f stands. Size of patch may be a few trees to several acres. | Usually objectionable to landowners. Patch cuts can be effective fire hazard reduction if scattered over large tracts. Size of patch may be a few trees to several acres. | Usually objectionable to landowners. Patch cuts can be effective fire hazard reduction if scattered over large tracts. Size of patch may be a few trees to several acres. | Best chance of profitable sale, since large and small diameter trees are removed. Merchantable products may offset the cost of treatment. $0 to 1,000 per acre. |
| Rx Fire | Not normally a tool for private landowners--- requires very specialized knowledge. Practical over large acreages. Requires favorable weather conditions, which may not occur. Smoke is complicating factor. | Not normally a tool for private landowners--- requires very specialized knowledge. Practical over large acreages. Requires favorable weather conditions, which may not occur. Smoke is complicating factor. | Not normally a tool for private landowners--- requires very specialized knowledge. Practical over large acreages. Requires favorable weather conditions, which may not occur. Smoke is complicating factor. | Not normally a tool for private landowners--- requires very specialized knowledge. Practical over large acreages. Requires favorable weather conditions, which may not occur. Smoke is complicating factor. | $200 to 1,500 per acre. |

[1] It is possible that fuel reduction may be done at a profit to the landowner if merchantable products (usually firewood) are removed. This situation has become increasingly rare due to the poor market for firewood. Cost includes slash treatment.

[Dave Root, Assistant District Forester, Colorado State Forest Service, Woodland Park District, was the writer/contributor of the Fuels Mitigation Strategies and Treatment Options and Fire Hazard Reduction Treatments table of this section.]

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# Appendices

Wildland Fire Statistics (http://www.nifc.gov/stats/historicalstats.html)

Threatened, Endangered, and Sensitive Species of the Pike & San Isabel National Forests and Commanche & Cimarron National Grasslands

Cascade Resort Communities, Inc. PUD Development Guidelines (Draft)

Mulches for Home Grounds (Colorado State University Coop. Ext. no. 7.214)

How to Pile Branches for the Chipper

Mountain Pine Beetle Quick Reference (Colorado State Forest Service, Fact Sheet 5.528)

Treatment of MPB Infested Trees (Colorado State Forest Service)

Slash Management with Regard to Ips Beetle (Colorado State Forest Service)

Management of Gambel (Scrub) Oak for Wildfire Hazard Mitigation (Colorado State Forest Service)

Forest Home Fire Safety (Colorado State University Coop. Ext. no. 6.304)

Creating Wildfire-Defensible Zones (Colorado State University Coop. Ext. no. 6.302)


This is a list of some of the most serious wildland fires in U.S. history. Some were significant because of their size, others because of the value of the resources lost. Some small, but very intense, fires were important because of the loss of lives and property. There have been larger fires than some of those included on this list, but few or none with greater impact on lives and resources.

## Historically Significant Wildland Fires

| Date | Name | Location | Acres | Significance |
|---|---|---|---|---|
| October 1804 | Fire recorded by Lewis and Clark | North Dakota | undetermined | A prairie was set on fire which resulted in 2 lives lost and 3 injuries. A mother saved her son by covering him with a green buffalo skin which acted like a fire shelter. |
| March 1805 | Fire recorded by Lewis and Clark | undetermined | undetermined | It was common for the Native Americans to ignite fires on the plains every spring to benefit the horses and buffalo. |
| October 1825 | Miramichi and Maine Fires | New Brunswick and Maine | 3,000,000 | 160 lives lost<br>Large amount of acreage burned |
| 1845 | Great Fire | Oregon | 1,500,000 | Large amount of acreage burned |
| 1853 | Yaquina | Oregon | 450,000 | Large amount of acreage burned |
| 1868 | Coos | Oregon | 300,000 | Large amount of acreage burned |
| October 1871 | Peshtigo | Wisconsin and Michigan | 3,780,000 | 1,500 lives lost in Wisconsin |
| 1871 | Great Chicago | Illinois | undetermined | 250 lives lost<br>17,400 structures destroyed |
| September 1881 | Lower Michigan | Michigan | 2,500,000 | 169 lives lost<br>3,000 structures destroyed |
| September 1894 | Hinckley | Minnesota | 160,000 | 418 lives lost |
| September 1894 | Wisconsin | Wisconsin | Several Million | Undetermined, some lives lost |
| February 1898 | Series of South Carolina fires | South Carolina | 3,000,000 | Unconfirmed reports indicate 14 lives lost and numerous structures and sawmills destroyed |

| | | | | |
|---|---|---|---|---|
| September 1902 | Yacoult | Washington and Oregon | 1,000,000 + | 38 lives lost |
| April 1903 | Adirondack | New York | 637,000 | Large amount of acreage burned |
| August 1910 | Great Idaho | Idaho and Montana | 3,000,000 | 85 lives lost |
| October 1918 | Cloquet-Moose Lake | Minnesota | 1,200,000 | 450 lives lost<br>38 communities destroyed |
| September 1923 | Giant Berkley | California | undetermined | 624 structures destroyed and 50 city blocks were leveled |
| August 1933 | Tillamook | Oregon | 311,000 | 1 life lost<br>Same area burned again in 1939 |
| October 1933 | Griffith Park | California | undetermined | 29 lives lost and 150 injured people |
| August 1937 | Blackwater | Wyoming | undetermined | 15 lives lost and 38 injured people |
| July 1939 | Northern Nevada | Nevada | undetermined | 5 lives lost<br>First recorded firefighting fatality in a sage brush fuel type |
| October 1943 | Hauser Creek | California | 10,000 | 11 US Marines killed and 72 injuries<br>Fire was started by a gunnery practice |
| October 1947 | Maine | Maine | 205,678 | 16 lives lost |
| 1949 | Mann Gulch | Montana | 4,339 | 13 smokejumpers killed |
| July 1953 | Rattlesnake | California | undetermined | 15 lives lost |
| 1956 | Inaja | California | 43,000 | 11 lives lost |
| November 1966 | Loop | California | undetermined | 13 El Cariso Hotshots lost their lives |
| 1967 | Sundance | Idaho | 56,000 | Burned 50,000 acres in just nine hours |
| September 1970 | Laguna | California | 175,425 | 382 structures destroyed |
| July 1972 | Moccasin Mesa | New Mexico | 2,680 | Fire suppression activities destroyed many archeological sites, which resulted in a national policy to include cultural resource oversight in wildland fires on federal lands |
| July 1976 | Battlement Creek | Colorado | undetermined | 5 lives lost |
| July 1977 | Sycamore | California | 805 | 234 structures destroyed |
| November 1980 | Panorama | California | 23,600 | 325 structures destroyed |

| | | | | |
|---|---|---|---|---|
| 1985 | Butte | Idaho | undetermined | 72 firefighters deployed fire shelters for 1 to 2 hours |
| 1987 | Siege of 87' | California | 640,000 | Valuable timber lost on the Klamath and Stanislaus National Forests |
| 1988 | Yellowstone | Montana and Idaho | 1,585,000 | Large amount of acreage burned |
| September 1988 | Canyon Creek | Montana | 250,000 | Large amount of acreage burned |
| June 1990 | Painted Cave | California | 4,900 | 641 structures destroyed |
| June 1990 | Dude Fire | Arizona | 24,174 | 6 lives lost<br>63 homes destroyed |
| October 1991 | Oakland Hills | California | 1,500 | 25 lives lost and 2,900 structures destroyed |
| August 1992 | Foothills Fire | Idaho | 257,000 | 1 life lost |
| 1993 | Laguna Hills | California | 17,000 | 366 structures destroyed in 6 hours |
| July 1994 | South Canyon Fire | Colorado | 1,856 | 14 lives lost |
| July 1994 | Idaho City Complex | Idaho | 154,000 | 1 life lost |
| August 1995 | Sunrise | Long Island | 5,000 | This fire woke up many to the fact that the East can have fires similar to the West. |
| August 1996 | Cox Wells | Idaho | 219,000 | Largest fire of the year |
| June 1996 | Millers Reach | Alaska | 37,336 | 344 structures destroyed |
| July 1997 | Inowak | Alaska | 610,000 | Threatened 3 villages |
| 1998 | Volusia Complex | Florida | 111,130 | Thousands of people evacuated from several counties |
| 1998 | Flagler/St. John | Florida | 94,656 | Forced the evacuation of thousands of residents |
| August 1999 | Dunn Glen Complex | Nevada | 288,220 | Largest fire of the year |
| August - November 1999 | Big Bar Complex | California | 140,947 | Series of fires caused several evacuations during a 3 1/2 month period |
| September - November 1999 | Kirk Complex | California | 86,700 | Hundreds of people were evacuated by this complex of fires that burned for almost 3 months |
| May 2000 | Cerro Grande | New Mexico | 47,650 | Originally a prescribed fire, 235 structures destroyed and Los Alamos National Laboratory damaged |

| | | | | |
|---|---|---|---|---|
| July 2001 | Thirtymile | Washington | 9,300 | 14 fire shelters were deployed<br>4 lives lost |
| June 2002 | Hayman | Colorado | 136,000 | 600 structures destroyed |
| June 2002 | Rodeo-Chediski | Arizona | 462,000 | 426 structures destroyed |
| July 2003 | Cramer | Idaho | 13,845 | 2 lives lost |
| October 2003 | Cedar | California | 275,000 | 2,400 structures destroyed<br>15 lives lost |
| 2004 | Taylor Complex | Alaska | 1,305,592 | Alaska fires during 2004 burned over 6.38 million acres |
| June 2005 | Cave Creek Complex | Arizona | 248,310 | 11 structures destroyed<br>Largest fire ever recorded in the Sonoran Desert |
| March 2006 | East Amarillo Complex | Texas | 907,245 | 80 structures destroyed<br>11 lives lost<br>Largest fire during 2006 fire season |

**Back to Wildland Fire Statistics**


## Lightning Fires (by Geographic Area)

| Year | Alaska | Northwest | Northern California | Southern California | Northern Rockies | Eastern Great Basin | Western Great Basin | Southwest | Rocky Mountains | Eastern Area | Southern Area | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | 54 | 2,170 | 948 | 409 | 1,970 | 2,259 | 943 | 3,220 | 2,479 | 256 | 1,457 | 16,165 |
| 2005 | 311 | 901 | 186 | 272 | 748 | 1,345 | 536 | 1,935 | 1,398 | 175 | 516 | 8,323 |
| 2004 | 270 | 2,042 | 670 | 323 | 1,090 | 1,760 | 781 | 2,062 | 1,340 | 88 | 958 | 11,384 |
| 2003 | 72 | 1,605 | 966 | 428 | 1,921 | 2,004 | 569 | 2,702 | 1,918 | 102 | 489 | 12,776 |
| 2002 | 165 | 1,797 | 301 | 179 | 1,130 | 1,602 | 556 | 2,469 | 2,039 | 372 | 825 | 11,435 |
| 2001 | 29 | 159 | 2,238 | 832 | 1,041 | 2,405 | 1,697 | 2,298 | 2,114 | 889 | 392 | 14 094 |

## Lightning Acres (by Geographic Area)

| Year | Alaska | Northwest | Northern California | Southern California | Northern Rockies | Eastern Great Basin | Western Great Basin | Southwest | Rocky Mountains | Eastern Area | Southern Area | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | 118,974 | 843,984 | 174,654 | 24,232 | 1,040,398 | 966,164 | 1,301,924 | 368,626 | 449,089 | 35,020 | 145,836 | 5,468,9 |
| 2005 | 4,431,965 | 122,131 | 25,417 | 79,450 | 75,450 | 766,114 | 988,303 | 571,734 | 37,857 | 1,834 | 67,982 | 7,168,0 |
| 2004 | 6,506,028 | 64,460 | 3,689 | 8,333 | 14,845 | 75,551 | 25,927 | 239,619 | 16,921 | 309 | 55,341 | 7,011,0 |
| 2003 | 537,239 | 234,331 | 45,624 | 4,812 | 744,150 | 172,958 | 12,418 | 148,384 | 93,354 | 125 | 45,048 | 2,038,4 |
| 2002 | 1,749,344 | 988,527 | 42,688 | 15,661 | 98,402 | 223,304 | 48,263 | 345,694 | 428,510 | 1,670 | 155,530 | 4,097,5 |
| 2001 | 10,039 | 394 | 185,212 | 135,689 | 137,455 | 507,190 | 62,309 | 190,667 | 6,453 | 41,209 | 545,983 | 1,822,6 |

## Human Caused Fires (by Geographic Area)

| Year | Alaska | Northwest | Northern California | Southern California | Northern Rockies | Eastern Great Basin | Western Great Basin | Southwest | Rocky Mountains | Eastern Area | Southern Area | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | 254 | 2,666 | 3,676 | 3,166 | 2,303 | 943 | 331 | 2,511 | 2,968 | 14,227 | 47,175 | 80,220 |
| 2005 | 296 | 1,924 | 3,010 | 3,781 | 1,183 | 813 | 262 | 3,287 | 1,940 | 13,014 | 28,920 | 58,430 |
| 2004 | 426 | 1,901 | 3,613 | 3,845 | 1,883 | 526 | 173 | 1,491 | 704 | 11,781 | 27,758 | 54,101 |
| 2003 | 379 | 2,370 | 3,795 | 3,929 | 1,970 | 944 | 227 | 1,657 | 4,214 | 14,851 | 16,479 | 50,815 |
| 2002 | 378 | 2,148 | 3,789 | 4,060 | 1,665 | 730 | 215 | 2,668 | 2,118 | 12,857 | 31,394 | 62,022 |
| 2001 | 320 | 18,743 | 1,060 | 4,099 | 1,801 | 2,160 | 770 | 34,605 | 4,135 | 2,096 | 277 | 70,066 |

## Human Caused Acres (by Geographic Area)

| Year | Alaska | Northwest | Northern California | Southern California | Northern Rockies | Eastern Great Basin | Western Great Basin | Southwest | Rocky Mountains | Eastern Area | Southern Area | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | 147,292 | 112,098 | 146,999 | 342,864 | 126,078 | 278,288 | 46,947 | 392,892 | 209,693 | 115,171 | 2,486,522 | 4,404,844 |
| 2005 | 8,184 | 219,012 | 37,658 | 61,728 | 53,616 | 187,248 | 43,811 | 267,043 | 48,356 | 85,589 | 509,082 | 1,521,327 |
| 2004 | 17,789 | 58,178 | 146,720 | 84,075 | 23,585 | 13,636 | 13,864 | 63,062 | 35,346 | 101,089 | 407,456 | 964,800 |
| 2003 | 22,093 | 126,381 | 96,415 | 653,016 | 137,309 | 182,916 | 5,161 | 127,332 | 87,823 | 235,391 | 248,412 | 1,922,249 |
| 2002 | 427,321 | 105,544 | 39,560 | 412,447 | 65,891 | 101,986 | 29,288 | 772,299 | 661,679 | 104,900 | 356,204 | 3,077,119 |
| 2001 | 206,844 | 196,226 | 114,996 | 101,240 | 29,981 | 98,677 | 75,483 | 761,605 | 85,744 | 20,229 | 57,636 | 1,748,661 |

*** Source: National Interagency Coordination Center (lightning and human caused fires and acres began in 2001)**

**Back to Wildland Fire Statistics**

# Wildland Fire Statistics

## Total Wildland Fires and Acres (1960-2006)

| Year | Fires | Acres |
|---|---|---|
| 2006 | 96,385 | 9,873,745 |
| 2005 | 66,753 | 8,689,389 |
| 2004 | 65,461 | *8,097,880 |
| 2003 | 63,629 | 3,960,842 |
| 2002 | 73,457 | 7,184,712 |
| 2001 | 84,079 | 3,570,911 |
| 2000 | 92,250 | 7,393,493 |
| 1999 | 92,487 | 5,626,093 |
| 1998 | 81,043 | 2,329,704 |
| 1997 | 66,196 | 2,856,959 |
| 1996 | 96,363 | 6,065,998 |
| 1995 | 82,234 | 1,840,546 |
| 1994 | 79,107 | 4,073,579 |
| 1993 | 58,810 | 1,797,574 |
| 1992 | 87,394 | 2,069,929 |
| 1991 | 75,754 | 2,953,578 |
| 1990 | 122,763 | 5,452,874 |
| 1989 | 121,714 | 3,261,732 |
| 1988 | 154,573 | 7,398,889 |
| 1987 | 143,877 | 4,152,575 |
| 1986 | 139,980 | 3,308,133 |
| 1985 | 133,840 | 4,434,748 |
| 1984 | 118,636 | 2,266,134 |
| 1983 | 161,649 | 5,080,553 |
| 1982 | 174,755 | 2,382,036 |
| 1981 | 249,370 | 4,814,206 |
| 1980 | 234,892 | 5,260,825 |
| 1979 | 163,196 | 2,986,826 |
| 1978 | 218,842 | 3,910,913 |
| 1977 | 173,998 | 3,152,644 |
| 1976 | 241,699 | 5,109,926 |

| | | |
|---|---|---|
| 1975 | 134,872 | 1,791,327 |
| 1974 | 145,868 | 2,879,095 |
| 1973 | 117,957 | 1,915,273 |
| 1972 | 124,554 | 2,641,166 |
| 1971 | 108,398 | 4,278,472 |
| 1970 | 121,736 | 3,278,565 |
| 1969 | 113,351 | 6,689,081 |
| 1968 | 125,371 | 4,231,996 |
| 1967 | 125,025 | 4,658,586 |
| 1966 | 122,500 | 4,574,389 |
| 1965 | 113,684 | 2,652,112 |
| 1964 | 116,358 | 4,197,309 |
| 1963 | 164,183 | 7,120,768 |
| 1962 | 115,345 | 4,078,894 |
| 1961 | 98,517 | 3,036,219 |
| 1960 | 103,387 | 4,478,188 |

* 2004 fires and acres do not include state lands for North Carolina

**Source: National Interagency Coordination Center**

**Back to Wildland Fire Statistics**

# THREATENED, ENDANGERED AND SENSITIVE SPECIES

# OF THE

# PIKE & SAN ISABEL NATIONAL FORESTS AND

# COMANCHE & CIMARRON NATIONAL GRASSLANDS

November 1, 2003

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## INTRODUCTION

The decline of many plants and animals has led to concerns for maintaining species viability. Species of high concern have been identified as those that have experienced drastic declines in numbers or habitat, or those that have extremely limited ranges and specialized habitat requirements. The Endangered Species Act of 1973 provided landmark legislation that initiated a strong legal foundation for the protection of species most at risk. The Region 2 Regional Forester's sensitive species list identifies species for which viability may be of concern.

The Resource Management Plan for the Pike and San Isabel National Forests, Comanche and Cimarron National Grasslands (PSICC) provides direction to maintain habitat for viable populations of all existing vertebrate species (FP III-32). Since the plan was written, concerns for plants and invertebrates have increased with a growing awareness of the need to maintain biodiversity. Part of the PSICC multiple-use mission is to manage for these species of special concern. In addition, there are legal requirements under the Endangered Species Act, NFMA, and NEPA to assess effects from our activities on these species and to ensure viability is maintained.

The following list contains selected federally-listed species within Colorado and Kansas and Region 2 sensitive species. These are the species that are currently residing or have a high likelihood of occurring on the PSICC . This list can be used to determine which species may be affected by project activities and need to be addressed in biological evaluations. Please note that this list may not be all inclusive. Many of these species have received very little inventory effort and might be found in additional locations when more surveys have been completed. Therefore, do not restrict concerns for these species only to known locations if suitable habitat is present.

Each species described is categorized by their federal and state status. The first portion of this report is dedicated to those species that are federally protected under the Endangered Species Act. These species are listed or proposed to be listed as threatened or endangered. The difference between these two listings is the relative level of rarity, as well as the degree of protection needed. Species that are listed as endangered are in immediate threat of becoming extinct, while those listed as threatened are those species that are likely to become endangered in the foreseeable future.

The second portion of this report is dedicated to those species that have been identified as sensitive by the R2 Regional Forester. Sensitive species are those plants and animals that meet the following conditions:

1. The species is declining in numbers or occurrences, and evidence indicates that it could be proposed for federal listing as threatened or endangered if actions are not taken to reverse or stop the downward trend. (FSM 2672.11a)

2. If species habitat is declining, continued loss could result in population declines that lead to federal listing as threatened or endangered if action is not taken to reverse or stop the decline. (FSM 2672.11a)

3. The species population or habitat is stable but limited. (FSM 2672.11a).

Additional status codes are included for federal candidate species. Candidate species means there is sufficient information indicating that formal listings under ESA may be appropriate.

State status for Colorado (CO) and Kansas (KS) is also included in this report. State threatened or endangered species are those plants or animals that have been identified by individual states as being rare for their specific states. These species receive recognition and are protected as non-game species.

## FEDERALLY-LISTED SPECIES

**SPECIES:** Bald Eagle *Haliaeetus leucocephalus*

**STATUS:** Federal - THREATENED
CO THREATENED (downlisted from Endangered), KS - ENDANGERED

**DISTRIBUTION/HABITAT:** Breeding Bald Eagles are rare in Colorado. Although some nesting does occur, most eagles migrate in summer to northern breeding grounds but return to lower latitudes during the winter. Winter habitat consists of roost trees along rivers and other large open bodies of ice-free waters which allow access to fish. Bald Eagles are know to forage in prairie dog towns on the plains.

Recently removed from list.

**SPECIES:** Whooping Crane *Grus americana*

**STATUS:** Federal - ENDANGERED
CO - ENDANGERED

**DISTRIBUTION/HABITAT:** The Whooping Crane occurs as a migrant during the spring and fall in eastern CO. They migrate annually, from the northern fresh-water breeding grounds to the southern winter grounds along the coastal prairies and salt marshes of the Texas Gulf. Whooping Cranes are generally found in shallow wetlands which have wide-range visibility

and are free from human disturbance. On the PSICC, whooping cranes may occur in Baca, Custer, Huerfano, Las Animas, Pueblo and Saguache Counties.

**SPECIES:** Piping Plover *Charadrius melodus*

**STATUS:** Federal - THREATENED
CO - THREATENED

**DISTRIBUTION/HABITAT:** Piping Plovers are rare spring and fall migrants in eastern Colorado, commonly breeding in the southeast portion of the state. Plovers may occur in Baca and Las Animas Counties and commonly use mud flats and shorelines of reservoirs and lakes.

**SPECIES:** Eskimo Curlew *Numenius borealis*

**STATUS:** Federal - ENDANGERED

**DISTRIBUTION/HABITAT:** This species is considered to be near extinction, and records are rare. They may occur as an accidental spring migrant along shorelines of reservoirs, lakes, and rain ponds.

**SPECIES:** Least Tern *Sterna antillarum*

**STATUS:** Federal - ENDANGERED
CO - ENDANGERED

**DISTRIBUTION/HABITAT:** This shorebird is an uncommon summer resident on the southeastern plains in the Arkansas River Valley. Breeding habitat consists of bare, sandy shorelines of islands in reservoirs (eg. Horse Creek Reservoir) and river sandbars.

**SPECIES:** Mexican Spotted Owl *Strix occidentalis lucida*

**STATUS:** Federal – THREATENED, CRITICAL HABITAT on PSI
CO - THREATENED

**DISTRIBUTION/HABITAT:** Mexican Spotted Owls have been located on the Pikes Peak, South Platte, and San Carlos ranger districts. Historic records include most of the Front Range. The owl is found in steep-sided canyons with old growth mixed conifer forests. It may also be found in the shady, cool canyons of the piñon-juniper zone. All nests in Colorado found to date occur on cliff ledges or caves along canyon walls. Critical habitat has been designated.

**SPECIES:** Prebles' Meadow Jumping Mouse *Zapus hudsonius preblei*

**STATUS:** Federal- THREATENED, PROPOSED CRITICAL HABITAT on PSI
CO - THREATENED

**DISTRIBUTION/HABITAT:** This Mouse occurs in north-central Colorado including El Paso, Jefferson and Douglas Counties. It occurs in riparian habitat below 7600' and can be found in adjacent uplands within 300' of riparian habitat. Critical habitat has been designated.

**SPECIES:** Black-Footed Ferret *Mustela nigripes*

**STATUS:** Federal - ENDANGERED
CO - ENDANGERED

**DISTRIBUTION/HABITAT:** The black-footed ferret is assumed to be extinct in Colorado, however reintroduction programs have been started. Suitable habitat occurs in plains grasslands with large prairie dog complexes. The Cimarron and Comanche National Grasslands may provide suitable habitat.

**SPECIES:** Canada Lynx *Lynx canadensis*

**STATUS:** Federal - THREATENED
CO - ENDANGERED

**DISTRIBUTION/HABITAT:** Lynx historically occupied most high elevation mountains in Colorado. Lynx have been reintroduced in Colorado. Their habitat includes dense coniferous forests in the subalpine zone and timberline where they use rock crevices, overhanging banks, deadfall, or hollow logs for denning. Lynx are dependent on snowshoe hare as their primary prey, and providing good hare habitat can benefit lynx. This habitat includes shrubs and saplings which provide food as well as cover from predators. Preferred lynx hunting habitat consists of 20 to 30 year-old pole-size stands of timber. Lynx prefer mature forest with deadfall for denning. Foraging habitat is considered a limiting factor in Colorado.

**SPECIES:** Colorado River Fishes:

Colorado Pikeminnow *Ptychocheilus*

*lucius*

Bonytail Chub *Gila elegans*
Razorback Sucker *Xyrauchen texanus*
Humpback Chub *Gila cypha*

**STATUS:** Federal - ENDANGERED
CO – THREATENED (Colorado Pikeminnow & Humpback Chub) and ENDANGERED (Bonytail Chub & Razorback Sucker)

**DISTRIBUTION/HABITAT:** The USFWS believes that the major causes for the decline of these Colorado River fish species are impoundments and water depletions from the Colorado River and its tributaries. If a project would result in the depletion of water or degradation of water quality to tributaries of the Colorado or White River, the Forest will request formal consultation. There is a programmatic BO for water depletions above the Gunnison. To fall under this umbrella BO the proponent must sign a recovery agreement (on file) and the Forest must retain descretionary authority to allow for reinitiation of consultation under Section 7.

**SPECIES:** Arkansas River Shiner *Notropis girardi*

**STATUS:** Federal - THREATENED

**DISTRIBUTION/HABITAT:** The Arkansas River Shiner is confined to major channels of the Arkansas River. It is found in unshaded turbid water with broad-braided, sandy bottoms and tolerates fluctuations in both flow rate and temperature. Spawning and juvenile dispersal are dependent on abruptly-increased water discharge during spring runoff. Elimination of peak discharges could result in its removal from a particular habitat. Know populations occur adjacent to NFS lands in the Cimarron River in Kansas.

**SPECIES:** Greenback Cutthroat Trout *Oncorhynchus clarki stomias*

**STATUS:** Federal - THREATENED
CO - THREATENED

**DISTRIBUTION/HABITAT:** The Greenback Cutthroat Trout occurs in the well-oxygenated headwaters of mountain streams. Due to competition and hybridization with non-native trout, Greenbacks are restricted to only 7 small drainages on the Pike and San Isabel National Forest. There are efforts throughout the Greenbacks' range to increase the number of populations so they can be delisted in the near future. Counties where the greenback are found include: Custer, Douglas, El Paso,

Huerfano, Lake, Park, and Pueblo.

**SPECIES:** Pawnee Montane Skipper *Hesperia leonardus montana*

**STATUS:** Federal - THREATENED

**DISTRIBUTION/HABITAT:** The Pawnee Montane Skipper is found in sparsely wooded grasslands and open pine forests along the Front Range. They are associated with *Liatris punctata* (prairie gayfeather), which flowers late summer through early fall and *Bouteloua gracilis* (blue grama). The butterfly is known to occur on approximately 25,000 acres of habitat along the South Platte River. Counties where it is known to occur are: Douglas, Jefferson, Park and Teller.

**SPECIES:** Uncompahgre Fritillary Butterfly *Boloria acrocnema*

**STATUS:** Federal - ENDANGERED

**DISTRIBUTION/HABITAT:** This species is known to occur only above 12,000 feet on northerly aspects of tall peaks. Females lay their eggs on snow willow (*Salix nivalis*), and the adults can be found in late July. The USFWS species occurrence list shows this species as potentially occuring in Chaffee, Lake, Park, and Saguache Counties.

**SPECIES:** Ute ladies'-tresses *Spiranthes diluvialis* Sheviak

**STATUS:** Federal - THREATENED

**DISTRIBUTION/HABITAT:** Distribution includes Douglas, El Paso, Jefferson Counties, within the perennial tributaries and 100-year flood plain of Fountain Creek (to southern boundary of El Paso County). It is also found along the South Platte River drainage from the Front Range and eastern plains. This orchid grows in seasonally moist soils & wet meadows near springs, lakes or perennial streams & their associated floodplains from 4500-6800 ft. Typical sites include old stream channels, abandoned meanders, alluvial terraces, subirrigated meadows & other sites where soils are saturated, at least temporarily, to within 18" of the surface during the spring/summer growing season. Flowering July-September.

**SPECIES:** Penland eutrema *Eutrema penlandii* Rollins

**STATUS:** Federal - THREATENED

**DISTRIBUTION/HABITAT:** Endemic to central Colorado in Park and Summit Counties, it is

known to occur on the leeward side of the crest of the Mosquito Range, from Hoosier Pass to Weston Pass. It grows downslope from persistent snowfields that provide moisture all summer; alpine tundra, fens or along rivulets where it is rooted in mosses that remain wet year-round with a constant source of flowing water. Elevations range from 12,000-13,200 ft. Flowering late June-early August; fruiting July-August.

## REGION 2 SENSITIVE SPECIES

R2 Regional Forester's list of sensitive species that have known occurrences or the potential to occur on the PSICC:

### AMPHIBIANS

**SPECIES:** Northern Leopard Frog *Rana pipiens*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Northern Leopard Frog occurs throughout Colorado except in the Republican River drainage and southeastern Colorado, south of the Arkansas River. It can range up to 11,000 feet in elevation, and inhabits the banks and shallow portions of marshes, ponds, lakes, reservoirs, beaver ponds, streams and other bodies of permanent water. The frog appears to be strongly associated with rooted aquatic vegetation.

**SPECIES:** Plains Leopard Frog *Rana blairi*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Plains leopard frog occurs in the Great Plains portion of the Arkansas River drainage in southeastern Colorado and in Kansas. It uses margins of streams, natural or artifical ponds, creek pools, reservoirs, creek pools, irrigation ditches and other bodies of water. There is some overlap between the ranges of the Northern and Plains leopard frogs. Invasion by bullfrogs has reduced Plains leoard frogs populations in many historic permanent water sources. However the Plains leopard frog can persist in habitats that dry up in the summer when bullfrogs cannot. Plains leopard frog occurrences have been documented on the Comanche and Cimarron NGs.

**SPECIES:** Boreal Toad *Bufo boreas boreas*

**STATUS:** SENSITIVE
Federal - CANDIDATE
CO - ENDANGERED

**DISTRIBUTION/HABITAT:** The Boreal Toad occurs throughout most of the mountainous portion of Colorado but appears to be absent from the Wet Mountains and Pikes Peak region. They are most common between 8,500-11,000 feet in elevation. This toad inhabits marshes, wet meadows, and the margins of streams, beaver ponds, lakes, and glacial kettle ponds in

subalpine areas of Colorado. It is found in shallow water or among sedges and shrubby willows where soil is damp or wet. The Boreal Toad is an insectivore.

## REPTILES

**SPECIES:** Massasauga *Sistrurus catenatus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** This rattlesnake occurs in plains and sandhill grasslands of southeastern Colorado and also has known occurences in western Kansas. Although restricted in range, this species may be locally common where it does occur. This species has documented occurences on the Comanche National Grassland in Baca, Otero and Las Animas Counties and may also occur on the Cimarron NG.

## BIRDS

**SPECIES:** Harlequin Duck *Histrionicus histrionicus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Harlequin Duck was once a summer resident and possibly occurred in Park and El Paso Counties. A small breeding population historically occurred in the mountains, but apparently became extinct in the 1880's. The duck breeds along swift, turbulent mountain streams with a high macroinvertebrate food source and dense riparian vegetation. Presently, the Harlequin Duck breeds on inland mountain streams and winters along the Pacific coast, but may still occur as a migrant .

**SPECIES:** Greater Sage-Grouse *Centrocercus urophasianus*

**STATUS:** SENSITIVE
Federal - CANDIDATE

**DISTRIBUTION/HABITAT:** Historic populations of greater sage-grouse (*Centrocercus urophasianus*) occurred in sagebrush habitats within Chaffee and Lake Counties. These populations are thought to be extirpated. Habitat consists of large, rolling expanses of continuous areas of sagebrush. It is unkown if historic populations in northern Chaffee and Lake Counties were Greater or Gunnison's sage-grouse.

**SPECIES:** Gunnison's Sage-Grouse *Centrocercus minimus*

**STATUS:** SENSITIVE
Federal - CANDIDATE

**DISTRIBUTION/HABITAT:** The Gunnison's sage grouse was identified as a distinct species in 2000. Populations have been re-introduced in the San Luis Valley. It is possible that some of these birds may use portions of the San Isabel National Forest in southern Chaffee County. It is unkown if historic populations in northern Chaffee and Lake Counties were Greater or Gunnison's sage-grouse.

**SPECIES:** White-tailed Ptarmigan *Lagopus leucurus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** This bird is a resident of the alpine tundra during summer. It may move below treeline in
winter. Birds are dependent on willow thickets, especially in winter when snows are deep. In summer they forage on seeds and leaves of herbaceous alpine vegetation, willows, and some insects. They inhabit all alpine regions of Colorado except the Wet Mountains and Spanish Peaks. They were transplanted to Pikes Peak in 1975.

**SPECIES:** Lesser Prairie-Chicken *Tympanachus pallidicinctus*

**STATUS:** SENSITIVE
CO - THREATENED
Federal - CANDIDATE

**DISTRIBUTION/HABITAT:** This bird is an uncommon resident in extreme southeastern Colorado and southwestern Kansas, including the Comanche and Cimarron National Grasslands . It occupies sandsage and mid-grass prairie communities. Nesting habitat may be a limiting factor, and consists of relatively thick herbaceous or shrubby vegetation. Breeding occurs on leks, where vegetation is shorter, and leks may be used repeatedly year after year. A population of the Lesser Prairie-Chicken was transplanted to Pueblo County.

**SPECIES:** American Bittern *Botaurus lentiginosus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The American Bittern is a summer resident on the eastern plains of Colorado and in mountain parks. It inhabits cattail marshes or wetlands with tall emergent vegetation and occasionally ventures into

adjacent wet meadows. This elusive bird is most active at dusk and night. The Bittern is known to occur on the Cimarron National Grasslands, and the Lower Arkansas River drainage provides a portion of the primary range in Colorado.

**SPECIES:** Northern Harrier *Circus cyaneus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Northern Harrier is a year-round resident of Colorado and Kansas with higher numbers during migration and winter than summer. Primary habitat consists of grasslands, mountain parks, shrublands, croplands and marshes. It may occur up to the alpine in fall. They nest on the ground and need abundant vegetative cover for nesting. Prey is primarily small mammals, although other prey are also taken (birds, insects).

**SPECIES:** Northern Goshawk *Accipiter gentilis*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Northern Goshawk is a resident in wooded areas of foothills and mountains up to treeline and generally only occurs in lower elevations during migration and winter. This hawk prefers mature stands of coniferous or deciduous woodlands with high canopy closure for breeding and open understories for foraging. Nesting occurs near wooded areas, with openings and water. The Northern Goshawk has been documented as far east as the Cimarron National Grasslands during migration and winter seasons.

**SPECIES:** Ferruginous Hawk *Buteo regalis*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Ferruginous Hawk is a buteo of the eastern Colorado plains and southwestern Kansas, including the Comanche and Cimarron National Grasslands. It occupies grasslands and semidesert shrublands; nests in trees, on rock pinnacles, and on the ground. This hawk feeds entirely on rodents in open country, and winter use is concentrated around prairie dog towns.

**SPECIES:** Peregrine Falcon (American) *Falco peregrinus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** Peregrine falcons breed in a wide variety of habitats but need adequate cliff ledges or rock outcrops for nesting. Peregrines prefer high, open, cliff faces that dominate the surrounding area. Through hacking efforts, the Peregrine is increasing in Colorado. Active aeries are known on the San Isabel and the Pike National Forests.

**SPECIES:** Mountain Plover *Charadrius montanus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** This plover favors open, arid lands that support short grasses, such as buffalo grass and blue grama, and scattered cactus on the eastern plains of Colorado and southwestern Kansas. It occurs locally in El Paso and Pueblo Counties and along the northern edge of the Arkansas Valley. The Mountain Plover is also known to breed on the Comanche and Cimarron National Grasslands and prefers flat terrain and often occurs around prairie dog colonies. Mountain plovers also use the high flat terrain of South Park. Although, most NFS land in South Park is not suitable habitat, plovers do occur adjacent to the Forest on BLM lands.

**SPECIES:** Long-billed Curlew *Numenius americanus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Long-billed Curlew occurs as a summer resident on the southeastern plains including the Cimarron National Grasslands. It historically occurred in mountain parks and valleys, including South Park, where it still may occur as a migrant. The Curlew is now found primarily in plains grasslands and sometimes in wheat fields or fallow fields and nests close to standing water.

**SPECIES:** Black Tern *Chlidonias niger*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** A spring migrant on the eastern plains and mountain parks in Colorado, the Black Tern is associated with aquatic habitats that have emergent vegetation, such as cattail marshes, with adjacent large open water in every county except Teller. It resides in Otero, Pueblo, and Park counties and the southeast portion of Fremont County in the summer where it usually nests in small colonies on floating vegetation. The tern is also known to occur on the Cimarron National Grasslands.

**SPECIES:** Yellow-billed Cuckoo *Coccyzus americanus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Yellow-billed Cuckoo is a rare to uncommon spring and fall migrant and summer resident of eastern Colorado and southwestern Kansas. It inhabits riparian forests along rivers (including the Arkansas River and Cimarron River) and urban areas with tall trees. The distinct population segment of the western yellow-billed cuckoo west of the continental divide has federal candidate status.

**SPECIES:** Flammulated Owl *Otus flammeolus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** Flammulated Owls are associated with mature to old growth ponderosa pine/Douglas fir forests along the Rocky Mountains. They are secondary cavity nesters and depend on woodpeckers for their nesting holes. This species is insectivorous and migratory, spending the winters in Mexico and Central America.

**SPECIES:** Burrowing Owl *Athene cunicularia*

**STATUS:** SENSITIVE
CO - THREATENED

**DISTRIBUTION/HABITAT:** This diurnal Owl is a summer resident in eastern Colorado and western Kansas. The Burrowing Owl inhabits treeless prairies and grasslands and has been found living near humans in vacant lots. It uses the burrows of prairie dogs and ground squirrels for shelter and nesting sites.

**SPECIES:** Short-eared Owl *Asio flammeus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** This owl is a year-round resident found primarily in the San Luis Valley, the northeastern plains of Colorado and in western Kansas. It has also been found in open mountain parks with accidental records outside of parks, although it is not known to breed in these locations. Habitat consists of open grasslands, agricultural areas, marshes and less commonly, shrublands. They are nomadic wanderers and are more common in winter than summer. They nest on the ground and need dense, tall vegetation to conceal the nest. They take small mammals such as voles as their primary prey.

**SPECIES:** Boreal Owl *Aegolius funereus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** Boreal Owls are associated with high elevation, subalpine mature and old growth spruce/fir forests. Forest types used include lodgepole pine, fir and spruce, and occasionally mixed conifer forests. Boreal owls require mature/old growth vegetation during the breeding season. They nest in tree cavities, requiring snags 15" dbh or larger. The owls are dependent upon woodpeckers to create suitable nesting cavities. Nesting habitat includes a mix of spruce/fir and open meadows which provide prey species, especially voles. Nests are typically found in association with water. Boreal owls may use younger-age tree stands for foraging during the non-breeding season. Home ranges cover as much as 2,200 acres, but can overlap extensively. Only a small area around the nest is defended during the breeding season.

**SPECIES:** Black Swift *Cypseloides niger*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Black Swift has localized distribution in the mountains in the summer with records in El Paso, Custer, Huerfano, Lake, Park, and Teller Counties. Some of these observations are thought to be of birds foraging at distances from nesting sites. It nests on precipitous cliffs near or behind high waterfalls.

**SPECIES:** Lewis' Woodpecker *Melanerpes lewis*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** Lewis' Woodpecker is a year-round resident of the foothills of southern Colorado and occurs in lowland and foothill riparian areas, ponderosa pine, pinon juniper woodlands, agricultural areas and urban areas with tall deciduous tress. On the southeastern plains it uses open farmland with scattered tall cottonwoods and avoids riparian forests because of competition with the red-headed woodpecker. It is known to occur in the Wet Mountains, Custer, Chaffee, El Paso, Fremont, Huerfano, and Pueblo Counties and the Comanche and Cimarron National Grasslands.

**SPECIES:** Three-toed Woodpecker (American) *Picoides tridactylus* (or *P. dorsalis*)

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Three-toed Woodpecker occurs in coniferous forests of high mountains, primarily in mature or old growth spruce-fir. It may also occur in ponderosa pine, Douglas fir and lodgepole pine vegetation types. The woodpecker is associated with snag abundance and insect outbreaks from disease or fire.

**SPECIES:** Olive-sided Flycatcher *Contopus cooperi*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** This species of flycatcher is primarily a mountain summer resident at elevations of between 10,000 and 11,500 feet in mature spruce-fir and Douglas-fir forests. It is a migrant at lower elevations, including the Cimarron National Grasslands. The Olive-sided Flycatcher is associated with montane-coniferous forests and its territories often contain large conifers and bogs and meadows. It may be spotted perching on high, conspicuous, dead branches.

**SPECIES:** Loggerhead Shrike *Lanius ludovicianus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Loggerhead Shrike occurs primarily in western valleys and eastern Colorado but ranges to montane meadows, riparian areas and piñon-juniper woodlands. Its habitat includes open country with scattered perching sites.

**SPECIES:** Purple Martin *Progne subis*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Purple Martin is a summer resident of the mountains of western Colorado but occasionally is found on the east slope and plains. In Colorado, it is known to breed in loose colonies of old growth aspen forests but also inhabits deciduous riparian woodlands, aspen stands, open coniferous forests, burns with snags, woodland edges and urban areas. Nesting occurs in tree cavities or eaves of buildings.

**SPECIES:** Cassin's Sparrow *Aimophila cassinii*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** Cassin's sparrows are a grassland species and are common on the eastern plains of Colorado and western Kansas. Habitat consists of sandsage shrublands and shortgrass prairie dotted with yucca, sandsage, cacti, and shrubs which are used as perching sites. They feed on insects, especially grasshoppers, in summer and small seeds of grasses and forbs in the winter.

**SPECIES:** Brewer's Sparrow *Spizella breweri*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** This species breeds primarily on the western slope and northeastern Colorado, however it may occur locally in mountain parks and valleys (South Park, Wet Mountain Valley) and foothills, and as a migrant on the eastern plains. Breeding habitat consists of sagebrush or other shrublands. During migration it can be found in agricultural, riparian, or urban areas along the eastern foothills. It is rare in extreme eastern Colorado and southwestern Kansas.

**SPECIES:** Sage Sparrow *Amphispiza belli*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The sage sparrow is dependent on relatively large stands (>30 ac) of big sagebrush for nesting. Prairie sandsage and high elevation sagebrush are not utilized for breeding (Kingery 1998). Breeding populations occur in western Colorado and the the San Luis Valley. The species may rarely occur as a fall or spring migrant on the easatern plains near the foothills or in mountain parks (Andrews and Righter 1992). Rarely occurs on the Cimarron NG as a migrant or vagrant, but it is not known to breed anywhere nearby (Cable et al. 1996).

**SPECIES:** Grasshopper Sparrow *Ammodramus savannarum*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Grasshopper Sparrow is a grassland bird that occurs in eastern Colorado and western Kansas. Habitat incudes grasses dotted with

taller plants which are used as song posts. They forage on the ground on exposed soil. As their name implies, they rely heavily on grasshoppers for food.

**SPECIES:** McCown's Longspur *Calcarius mccownii*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** McCown's Longspur is a grassland species known to breed in northcentral and northeastern Colorado (Andrews & Righter 1992). During migration and winter it may be found throughout the eastern plains and occasionally on the west slope. On the Cimarron National Grassland the species is an uncommon migrant and winter resident (Cable et al. 1996). McCown's longspurs select short-grass prairie habitats or mixed-grass prairie which has been heavily grazed (Kingery 1998).

**SPECIES:** Chestnut-collared Longspur *Calcarius ornatus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The chestnut-collared longspur is known to breed in northeastern Colorado, and may occur throughout the eastern plains during migration and occasionaly during winter (Kingery 1998; Andrews and Righter 1992). The species is a common winter resident on the Cimarron National Grassland (Cable et al. 1996). Primary habitat is short-grass prairie, although the species sometimes occurs in mid-grass prairies as well. Within short-grass habitats, the chestnut-collared longspur utilizes taller patches of vegetation, unlike the McCown's longspur (Andrews and Righter 1992).

## FISH

**SPECIES:** Southern Redbelly Dace *Phoxinus erythrogaster*

**STATUS:** SENSITIVE
CO - ENDANGERED

**DISTRIBUTION/HABITAT:** There is only one known population of Southern Redbelly Dace in Colorado. This population is located in a small tributary to the Arkansas River in Pueblo. Single specimens have been collected from the Arkansas River in Pueblo and Canon City and from Turkey Creek in Pueblo County. This species inhabits slow-moving waters

in small creeks that have ample riparian vegetation for shade. Habitat found primarily in streams and ponds that are clear with sand and silt substrates. Generally a herbivore, feeding on algae and diatoms. Currently, no suitable habitat is apparently available on the Cimarron and little suitable habitat is available on the Comanche NG.

**SPECIES:** Northern Redbelly Dace *Phoxinus eos*

**STATUS:** SENSITIVE
CO - ENDANGERED

**DISTRIBUTION/HABITAT:** Populations in CO have been reduced by stream channelization, discharge reductions, and water quality changes; now threatened by rapid human development. Threatened by activities that threaten spring-fed streams. Not known, but may, occur on FS lands in South Dakota, Colorado and Nebraska. Drastic declines in habitat in Colorado. It is threatened by any activity adversely affecting the spring-fed streams.

## INVERTEBRATES

**SPECIES:** Rocky Mountain Capshell Snail *Acroloxus coloradensis* (or *Ferrissia fragilis*)

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** Recent studies indicate that this freshwater limpet is found in the littoral zone of oligotrophic and mesotrophic mountain lakes from 8,800 to 9,800 feet in elevation. It appears to prefer neutral to slightly alkaline water with high dissolved oxygen content. The Rocky Mountain Capshell Snails are generally associated with the planorbid snail, *Promenetus coloradoenis*. At present, the only known Colorado populations occur at Lost Lake and Peterson Lake in Boulder County, Teal Lake and Upper Big Creek Lake in Jackson County and Finch Lake in Rocky Mountain National Park. However, it is possible that this gastropod may be present in both Pike and San Isabel NFs.

**SPECIES:** Regal Fritillary Butterfly *Speyeria idalia*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** This butterfly is associated with mesic prairie environments. The adults of this species emerge mid-June to mid-September in wet

meadows and marshlands where they lay their eggs on dead vegetation. The larvae overwinter as hatchlings and are nocturnal feeders of *Viola* plant species in the spring. The Regal Fritillary Butterfly may occur in the Cimarron National Grasslands and in the following counties: Douglas, El Paso, and Jefferson.

**SPECIES:** Hudsonian Emerald *Somatochlora hudsonica*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The dragonflies are terrestrial as adults and aquatic as larvae. Boggy wetlands, streams, ponds and reservoirs are probable breeding sites. The Hudsonian Emerald dragonfly is documented in Teller and Lake Counties. More information about habitat and distribution in Colorado is needed. Populations appear to be relict and highly disjunct. Changes to habitats could presumably eliminate entire breeding populations. While little is known of population or habitat trends, habitat requirements are highly specific. They require boggy ponds that are extremely vulnerable to modification through dewatering, grazing, pollution, and siltation. The species does not recover well from disturbance.

## MAMMALS

**SPECIES:** Pygmy Shrew *Sorex hoyi*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The pygmy shrew occupies a wide range of habitats in the mountains of central Colorado at

elevations above approximately 9,600 ft., such as subalpine forests (including logged forests or clearcuts), edges of meadows, boggy meadows, willow thickets, aspen-fir forests, and subalpine parklands (Fitzgerald et al. 1994). The species is active day and night, feeding on a variety of invertebrates and carrion (Fitzgerald et al. 1994).

**SPECIES:** Fringed Myotis *Myotis thysanodes*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Fringed Myotis inhabits coniferous woodlands and shrublands below 7,500 ft, including ponderosa pine woodlands and oakbrush (Fitzgerald et al. 1994). The species forages by gleaning a wide variety of prey off vegetation. Caves, mines, and buildings may be

used as roost sites or hibernation sites. Few records exist from Colorado, and they are widely scattered (Fizgerald et al. 1994).

**SPECIES:** Spotted Bat *Euderma maculatum*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** This Bat is known to occur on the western slope in Moffat and Montezuma Counties near Mesa Verde where a specimen was recently found in a Mexican spotted owl pellet. Although no known records exist, there is some potential for the Spotted Bat to occur on the PSICC. The nearest record is in northern New Mexico in Rio Arriba County. The Spotted Bat does not use caves but roosts in rock crevices and cliffs. It has been found in coniferous forests and piñon juniper, and is one of the few bats that has an audible echo location call which can be heard with the naked ear.

**SPECIES:** Townsend's Big-eared Bat *Plecotus townsendil*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** Townsend's Big-eared Bats are cave dwelling bats and have been found in a wide variety of habitats, from arid juniper/pine forests to high elevation, mixed-coniferous forests. In winter, large aggregations of bats roost communally in caves or abandoned mine tunnels. They have also been known to use abandoned buildings. During the breeding season, females roost with their young in nursery colonies. Occasionally, tree cavities are used as roosts by individuals.

**SPECIES:** Gunnison's Prairie Dog *Cynomys gunnisoni*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Gunnison's prairie dog occurs in grasslands and montane or semidesert shrublands of southwestern and southcentral Colorado, and occur at elevations ranging from 6,000 to 12,000 feet. (Fitzgerald et al. 1994). They feed primarily on grasses and sedges, but are known to eat a broad range of other plants as well. The species forms loose aggregations which are not as socially organized as black-tailed prairie dog colonies. Only a small percentage of burrows have mounds of excavated dirt at the entrances (Fitzgerald et al. 1994). The species hibernates during the winter.

**SPECIES:** Black-tailed Prairie Dog *Cynomys*

*ludovicianus*

**STATUS:** SENSITIVE
Federal Candidate

**DISTRIBUTION/HABITAT:** The Black-tailed Prairie Dog occurs in eastern Colorado and western Kansas and inhabits open prairies habitat. It is found in areas with flat to gently rolling hills. The decline of the Black-tailed Prairie Dog is related to loss of prairie habitat, control measures (especially poisoning), and Sylvatic plague.

**SPECIES:** Swift Fox *Vulpes velox*

**STATUS:** SENSITIVE
Federal - CANDIDATE

**DISTRIBUTION/HABITAT:** The Swift Fox occurs in eastern Colorado and western Kansas and is associated with plains grasslands habitat. This species inhabits open prairies, plains and shrubby desert areas, typically away from extensively cultivated land. It is found in areas with gently rolling hills or undulating topography. The decline of the Swift Fox is related to loss of prairie habitat, prairie dog control and excessive trapping pressure.

**SPECIES:** American Marten *Martes americana*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** Marten occur at elevations of 8,000 - 13,000 ft in Colorado. They are associated with spruce-fir and lodgepole vegetation types with mature to old growth structural stages, although they may occur in lower-elevation montane forests as well. Marten are semi-arboreal and can use trees for denning and foraging. They prefer moderate to high canopy cover, especially in winter. Snags and down dead material are important components of denning and foraging habitat. A variety of prey is taken, including mice, voles, lagomorphs, sciurids, shrews, beavers, insects, and rarely birds, along with some vegetation (Fitzgerald et al. 1994).

**SPECIES:** Wolverine *Gulo gulo*

**STATUS:** SENSITIVE
CO - ENDANGERED

**DISTRIBUTION/HABITAT:** The Wolverine may occur in the following Colorado counties: Chaffee, Clear Creek, Custer, Huerfano, Jefferson, Lake and Park. The Wolverine is a scavenging predator and depends on a diverse ungulate population with a high turn-over rate. It is a solitary animal

and can cover great distances in short time periods. Even under optimal habitat conditions, Wolverines have low natural densities. They have extremely large home ranges covering up to 160 square miles in their constant search for carrion. Wolverines are found in mature and intermediate timbered areas around natural openings, including cliffs, slides, basins and meadows. Their habitat use varies seasonally; in summer, they favor cooler subalpine and alpine areas.

**SPECIES:** Common Hog-nosed Skunk *Conepatus leuconotus*

**STATUS:** SENSITIVE

**DISTRIBUTION/HABITAT:** The Common Hognosed Skunk occurs in southeastern and southcentral Colorado. It is found in grasslands and foothills and prefers partly wooded, brushy, rocky areas; particularly areas with oakbrush and pinyon-juniper woodlands (Fitzgerald et al. 1994). The species appears to have a broad diet, including insects, reptiles, mammals, carrion, and vegetation. Extensive rooting for insects may provide evidence of their presence in an area (F. Miller 1925 cited in Fitzgerald et al. 1994).

**SPECIES:** River Otter *Lontra canadensis*

**STATUS:** SENSITIVE
CO - THREATENED

**DISTRIBUTION/HABITAT:** River otters are tied to aquatic/riparian habitats with abundant fish or crustaceans and a minimum

flow of approximately 10 cubic feet per second (Fitzgerald et al. 1994). Ice-free reaches are required in winter, and the species may also inhabit lakes and reservoirs. Dens and resting sites may be located in beaver bank dens, logjams, dense riparian vegetation, snow caves, undercut banks, beaver lodges, and similar sites (Fitzgerald et al. 1994).

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# CHIPITA RANCH NO. 2

## BY CASCADE RESORT COMMUNITIES, INC.

## PUD DEVELOPMENT GUIDELINES

### GENERAL DEVELOPMENT PLAN

### EL PASO COUNTY, COLORADO

January, 2007


Prepared by:

**LAND RESOURCE ASSOCIATES**
4455 Fountain Avenue
Cascade, Colorado 80809


Prepared for:

**CASCADE RESORT COMMUNITIES, INC.**
4455 Fountain Avenue
Cascade, Colorado 80809

DRAFT

size of vehicles using the street, density, topography, drainage system, utility plancement, parking requirements, turning and turn-around movements, and market preference.

Development Guidelines:

1. The primary street section standards, emergency road/common driveway section standards and driveway section standards for Chipita Ranch No. 2 are included in Appendix C hereto.

2 All streets, emergency access roads and common driveways (as shown on the PUD Plan) will be maintained by Cascade Metropolitan District No. 2. The streets and emergency access roads will be public and owned by Cascade Metropolitan District No. 2.

3. The long range image of the development is impacted by the character of the entry and primary roads. Landscaped plantings along each side of the primary roads are intended to enhance the entry aspects of the development. Minimal clearing of existing trees is planned. Any landscaping within any publicly owned right of way shall be subject to the approval of the Design Review Board, Cascade Metropolitan District No. 2 and the El Paso County Department of Transportation.

## E. WILDFIRE MITIGATION

Development Objective:

The developer of Chipita Ranch No. 2 is responsible for planning and developing the lots in a manner consistent with contemporary wildfire hazard mitigation techniques utilizing the Wildfire Mitigation Measures included in Appendix A hereto and applicable Green Mountain Falls Fire Protection District, Colorado State Forest Service, and El Paso County techniques and requirements. The home builder is responsible for designing and constructing homes which are sensitive to the environmental hazards existing within or nearby the proposed buiding site. The homeowners and the Cascade Metropolitan District No. 2 are ultimately responsible for the maintenance of their homes and home sites in a manner consistent with the adopted Wildfire Hazards Mitigation Plan, the Green Mountain Falls Fire Protection District's regulations and recommendations and rules and regulations adopted by Cascade Metropolitan District No. 2.

## F. WILDLIFE PROTECTION

Development Objective:

The developer of Chipita Ranch No. 2 is responsible for planning and developing the lots in a manner consistent with contemporary wildlife protection techniques utilizing the Wildlife Protection Measures included in Appendix B hereto, as recommended by the Colorado State Division of Wildlife. The homebuilder and homeowner are responsible for designing and improving the dwelling and lot in a manner consistent with the measures and restrictions contained in Appendix B hereto, the CC&R's for Chipita Ranch No. 2, and such other rules and regulations promulgated by the State of Colorado or other governmental entity with jurisdiction over the Property.

## VI. PLOT PLAN APPROVALS

The El Paso County Land Development Code requires plot plan approval for a structure on any lot or tract within a PUD zone before a building permit may be issued. To expedite this procedure, and to reduce unneccessary work for the El Paso County Planning Department, the following plot plan approval procedure is hereby established.

A. Each lot shall require a plot plan on a minimum size of 24" x 36" drawing at a scale adequate to provide the required information clearly, which at a minimum must include the following information:

1. The location, height, and dimensions of each existing and proposed building or structure in the development area and the uses to be contained therein.

2. The proper building setbacks and building areas with reference to property lines, highways or street rights of way and easements.

3. The location and surfaces of all parking areas, driveways and internal roads.

4. The location of watercourses and other natural and historic features.

5. Existing and proposed contours at a 2' contour level.

6. The location of all existing and proposed recreation and open spaces.

7. The location of all permanent accesses from publicly dedicated or private streets.

8. A vicinity map to locate the development in relation to the community.

9. Location of all proposed uses, structures, and other natural or man-made features and relationship of uses, structures and features to internal and adjoining uses, structures and features.

10. Location and size of all existing trees and brush to remain within 30' of the proposed structure and brief statement describing how the remaining trees and brush are in compliance with the Wildfire Mitigation requirements contained in Section D above.

11. Location of all utility service lines including: water, electric, natural gas and telephone.

12. One set of building elevations and interior floor plans.

13. Approval of the Design Review Board and the Cascade Metropolitan District No. 2.

14. For Lots 1 through 6, a copy of the required rockfall mitigation measures set forth in Section V.B.11 hereof.

15. The El Paso County Planning Department may require additional information in the event that development guideline elements of this document are not adequately addressed.

B. Upon receiving a complete plot plan submittal conforming with these requirements, the El Paso County Planning Department shall process the request within ten (10) working days. Approval will be required by the El Paso County Planning Department for purposes of obtaining a building permit. The El Paso County Planning Department may attach conditions of approval to ensure compliance with these Guidelines, the Development Plan and all other applicable federal, state or local regulations.

C. If the Plot Plan is not approved by the Planning Director, the decision may be appealed to the El Paso County Board of Adjustment. The procedures for such appeal shall be the procedure set forth in the El Paso County Land Development Code for appeals to said Board. The appeal must be fully detailed in writing and shall be submitted to the Planning Department within thirty (30) days of the Director's final action. The burden of proof for said appeal rests with the petitioner.

APPENDIX A

## HOME AND WILDFIRE MITIGATION MEASURES

1. All ground level decks be required to be sealed off and enclosed in order to prevent the accumulation of flammable debris underneath them.
2. Roof vents in structure overhangs (soffits) to be secured at six points of contact instead of four, particularly where the positioning of the roof vents will not be readily accessible for regular maintenance.
3. Non-combustible roof materials to be used in the construction of all structures. All roofs, as well as rain gutters, to be inspected annually for fine fuel accumulation.
4. The use of tall to medium height ornamental junipers in the landscape to be prohibited within thirty feet of a structure's foundation.
5. Turnouts and turnarounds to be provided on all streets, emergency access lanes and common driveways at direction of Fire Protection Districts.
6. No on-street parking will be permitted.
7. All oak brush, if present, to be removed within ten feet of all streets on the downhill side.
8. Hydrants to be located at direction of Fire Protection Districts.
9. Cascade Metropolitan District No. 2 to perform and enforce annual on-going forestry plan, including thinning treatments and removal of diseased trees.
10. All structures to be reviewed for wildfire risk prior to submittal of the building plan to Regional Building. A written review shall be included as part of the subdivision's architectural review process.
11. A 10-16 foot barrier between oak stands be created. These barriers will have the Gambel oak and mountain mahogany removed in order to transform the locations to Fuel Model 1, per the Wildfire Hazard & Mitigation Report for Pyramid Mountain and Chipita Ranch Nos. 1 & 2. The height of the residual oak stand will determine the spacing required for treatment. This treatment will be performed in conjunction with the placement of a structure within a lot in order to maximize the privacy afforded by the oak but reducing continuity of the fuel bed.
12. The three wildfire safety zones around structures as recommended in the Wildfire Hazard and Mitigation Report be enforced as part of the architectural review process and the annual enforcement by the District.
13. The District shall develop an educational plan to help keep the threat from wildfire foremost in the community's mind.
14. The District shall schedule cleanup days in the spring and fall after pine needle drop. This will allow an opportunity for the community to work together to improve and maintain its wildfire safety.

APPENDIX B

## WILDLIFE PROTECTION MEASURES

1. No harassment of wildlife shall be permitted. With the exception of bird feeders, the feeding, baiting, salting or other means of attracting wildlife to individual yards or Common Elements shall be prohibited. Bird feeders, suet feeders, and hummingbird feeders should be placed so they are inaccessible to bears, raccoons, skunks and other wildlife species that might cause damage or threaten human safety.
2. No fences, walls or other barriers shall be permitted for the purpose of enclosing or demarcating any property boundaries. Fencing permitted in the immediate building envelope or area surrounding a residential unit shall be of a smooth wire construction with a maximum top height of 42".
3. No person shall allow any dog owned or controlled by such person to roam within Pyramid Mountain unattended. Dogs shall either be contained indoors or enclosed in a dog run or kennel constructed for the purpose of confinement in a manner approved by the Design Review Board. It is recommended that kennels be constructed with a top to prevent dogs becoming prey to mountain lions and other wildlife. At all other times, dogs shall be on a leash and under the direct control and supervision of their owners.
4. Cats must be restricted to the domicile unless a bell is worn on the cat's collar to alert nesting birds of their presence.
5. Pet food should be kept within the domicile, garage or similar substantive storage facility and should be provided to pets outside for brief periods only to prevent serving as an attractive nuisance to bears, raccoons, skunks and other wildlife species. Pet food should never be left outside for extended periods of time.
6. Trash should be kept in bear-proof containers, in a garage, or similar storage facility until the day of pick-up/disposal to prevent serving as an attractive nuisance to bears, raccoons, skunks, dogs and other wildlife and domestic species.
7. No motorcycle, motorbike, snowmobile, or other motorized recreational vehicle shall be operated within Pyramid Mountain Common Elements except for licensed motorcycles and motorbikes that are driven on the roadways.

G A R D E N I N G S E R I E S

# BASICS

## Mulches for Home Grounds

no. 7.214

*by J.R. Feucht*[1]

### Quick Facts...

A mulch is any material that provides protection and improves the soil when applied to the soil surface.

There are two types of mulches: organic and inorganic.

Depending on the type, mulches:

- Reduce surface evaporation.
- Improve water penetration and air movement.
- Control soil temperature fluctuations.
- Protect shallow-rooted plants from freeze damage and frost-heave.
- Improve soil structure and nutrient availability.

There are two types of mulches, organic and inorganic. Organic mulches include wood and bark chips, straw, grass clippings and seed hulls. Inorganic or inert mulches include weed-barrier fabrics, gravel and rock.

The ideal mulch does not compact readily. It does not retard water and air movement into the soil, it is not a fire hazard, and it breaks down slowly. In addition, the ideal mulch is uniform in color, weed-free, attractive and does not blow away.

### Selection

The selection of a mulch depends on its intended use (Table 2). If appearance is the main goal, inorganic or inert mulches may be the best choice.

If soil improvement is the major goal, consider an organic mulch that gradually breaks down. Also consider the size of the area in relation to the cost of materials and availability (Table 1).

If the area is used primarily for annual flowers, it often is more practical to use a temporary organic mulch that can be turned under each fall.

### When to Apply Mulches

Mulches used to enhance appearance and control weeds may be applied at any time. If the mulch will be used to protect fall transplants by keeping soil temperatures above freezing longer into the fall (permitting better root growth), apply soon after transplanting.

If the mulch is meant to reduce frost heave and delay spring growth, apply after the ground has frozen. This type of mulch often is used to protect small bulbs such as squill and crocus and to prevent early emergence.

### Depth of Mulches

Except where weed-barrier fabrics are used alone or in combination with chips, stones, or other material, apply most mulches to a depth of 3 to 4 inches. Apply straw, dried leaves and similar materials to a depth of 4 to 6 inches.

Some mulches, particularly straw and loose leaves, may harbor rodents. When using these mulches, do not place them closer than 6 inches to the base of woody plants. When these types of mulches are placed next to the plant, rodents living in the mulch may chew the bark of the plants, girdling and killing them. In windy areas, gravel or rock mulch may be preferred over organic mulches.

### Preventing Nitrogen Deficiency

As organic mulches decompose, some of the soil nitrogen in contact with the mulch is used by the breakdown organisms. Consequently, nitrogen

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**Table 1: Area covered to a given depth by one cubic yard of mulch.**

| Area (sq. feet) | Depth of mulch (inches) |
|---|---|
| 80 | 4 |
| 100 | 3 |
| 160 | 2 |
| 325 | 1 |

deficiency may occur. A sign of nitrogen deficiency is a yellowing, primarily of the lower leaves. When this occurs, add nitrogen fertilizers.

For every 100 square feet of mulched area, add 2 pounds of a complete fertilizer, such as 10-6-4, or 1/4 pound of ammonium sulfate. Never use a "weed-and-feed" type of fertilizer in mulched areas.

**Table 2: Types of mulches and their advantages and disadvantages.**

| Mulch type | Advantages | Disadvantages | General Comments |
|---|---|---|---|
| | | **Organic Mulches** | |
| Cocoa-bean hulls | Long lasting, dark brown color. Expensive. | Compact; forms a crusty surface. Harmless if stirred to break crust. | Molds may form on surface. |
| Crushed corncobs | Uniform in color. | May retain too much moisture at surface or compact if kept wet. | Cobs dyed various colors. Availability limited in some areas. |
| Grass clippings | Readily available. | Must be applied loosely, in thin layers to reduce matting. | Allow grass to dry before applying as a mulch. |
| Hops | Attractive color. Nonflammable. | Disagreeable odor until dry. | May be available from local brewery. |
| Leaves (composted) | Readily available. | Not very attractive. May become matted. | Good soil amendment. |
| Leaves (fresh dried) | Readily available. | Not very attractive. May blow. away. Fire hazard. Wet leaves compact into slimy mats. | Most appropriate in naturalized gardens or shrub masses. |
| Manure (strawy) | Usually available. | Unpleasant odor. Weed seeds. | Better soil amendment than mulch. Should be aged and/or heat treated. |
| Newspaper | Readily available. | Don't use color inserts or red ink. | Use 3 to 6 sheets thick and cover with organic mulches. |
| Peat (sphagnum) | Usually available in bulk amounts. | May crust on surface. May blow away. | The only acid-forming peat, but even this is variable with source. Best used as a soil amendment, not as a mulch. |
| Pine needles | Attractive. Do not compact. | Difficult to obtain in quantity. Can be a fire hazard. | Best for winter protection of fall-transplanted material. |
| Shredded bark, bark chips, chunk bark | Long-lasting, attractive (chips more attractive than fine shreds). | Cost relatively high. Shredded bark may compact. | Use for informal walkways. |
| Straw | Readily available. | Blows easily. Highly flammable. Weed seeds often present. | Best used as a temporary mulch around plants needing protection in winter. Anchor with wire mesh. |
| Wood chips, shavings, pole peelings, recycled shingles | Long lasting. Readily available. | Texture and color not uniform. | Rustic but usually attractive. Will not compact readily. |
| | | **Inorganic, inert mulches** | |
| Clay aggregates (heat treated) | Gray/brown colors available. Lighter than gravel, easier to transport. Weed-free. | Expensive. | Brand names available (Turface, Terragreen). |
| Weed-barrier fabrics | Reduces weeds. Allows air and water penetration. Long lasting if covered with mulch. Easy to apply. | Some may be costly. Most deteriorate in sunlight unless covered with another mulch material such as wood chips. | A good substitute for black plastics. |
| Gravel, stone. | Available in colors to match or complement the architecture. Inexpensive. | Will not prevent growth of some weedy grasses. | Use black polyethylene beneath to prevent weeds. |

[1]*Colorado* State *University Cooperative Extension landscape plants specialist and professor (retired), horticulture.*

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Milan A. Rewerts, Director of Cooperative Extension, Colorado State University, Fort Collins, Colorado. Cooperative Extension programs are available to all without discrimination. No endorsement of products mentioned is intended nor is criticism implied of products not mentioned.

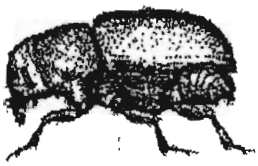
# How to Pile Branches for the Chipper!

When collecting your branches for chipping, place the cut edge of the branch on the edge of the roadway. Try to have all branches in one location if possible. (See photo above.)

The mulch from the chipping will be blown onto your property for your use. Please take a copy of the handout on ways to use this mulch. The mulch is not a fire concern and can be of good use to the homeowner.

If possible, have someone available to hand branches to the *operator of the chipper*. Under **no** circumstances will a volunteer or homeowner be allowed *to feed* the chipper.

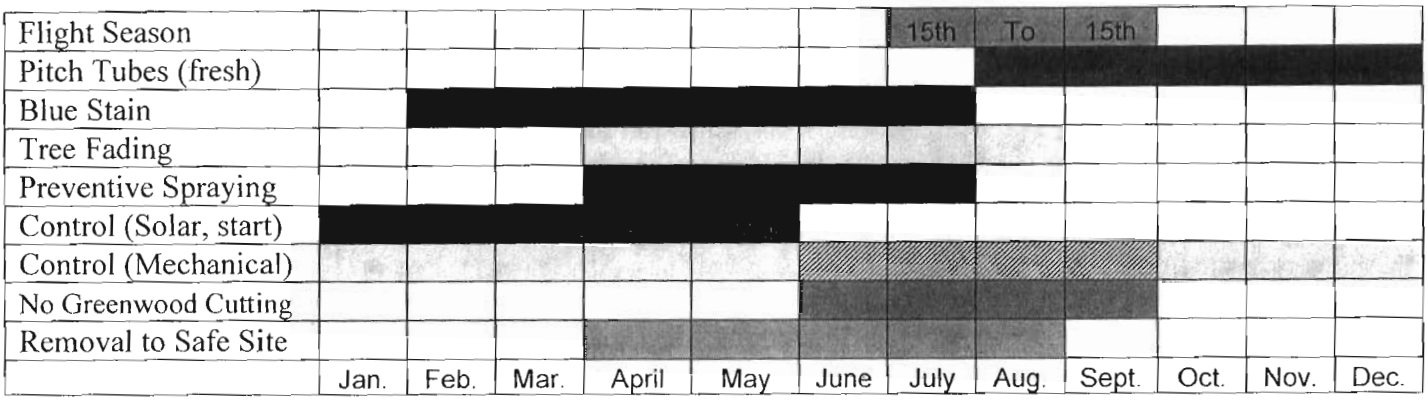
Cwpp.photo by KAB.May.2007



Colorado State FOREST SERVICE

Woodland Park District
PO Box 9024
Woodland Park, CO 80866
(719) 687-2921

# Mountain Pine Beetle Quick Reference




**Flight Season:** July 15 through September 15; the time of year when beetles are emerging and seeking live green trees to attack. Beetle emergence is at its peak in mid-August. During this time, beetle pairs (male and female) will attempt to bore into the bark through one hole, form an egg gallery, and lay approximately 75 eggs. *Note: The flight can begin earlier in warmer years.*

**Pitch Tubes:** Accumulations of sap; a trees' natural defense against beetle attacks. Large white to pinkish tubes may indicate an unsuccessful attack. Beetles are often found drowned in these large accumulations. Smaller reddish to brown pitch tubes indicate a successful attack. Pitch tubes are fresh when they have a crystallized honey texture and there are no exit holes (1/8 inch symmetrical pitch-free holes) present on the tree. Pitch tubes may persist on the trunk for a few years after the attack, but are hard and crusty.

**Blue Stain:** A fungus beetles introduce into attacked trees, not usually detected until mid to late February on newly infested trees from the previous flight season. This fungus will eventually kill the tree by disrupting the vascular system and causing the needles to fade from a lack of nutrients and water.

**Tree Fading:** Turning of newly attacked trees from a darker green to yellowish green and eventually brown. Fading trees are a result of the previous flight seasons' beetle attacks and blue stain fungus. Fading is apparent approximately 8 to 10 months after a successful attack.

**Preventive Spraying:** A formulation of *carbaryl*; Sevin, or *permethrin*; Astro, can be used to prevent beetle attacks on individual trees. Spray is applied to living green trees in spring or early summer (before June 1) to deter attacking beetles and is effective through one flight season. *Always carefully read and follow label precautions before applying insecticide for mountain pine beetle prevention and control.*

**Control (Solar):** Solar Treatment refers to the cutting and exposing of infested tree parts to the sun. Areas with full sunlight are best. Begin solar treatment as soon as the attack is confirmed. The goal is to dry out the live layer under the bark. Bucking up and splitting logs dramatically speeds up the process. Bucked up sections should be rolled periodically to expose all sides to the sun.

Wood cut after April 1st must be covered with plastic and monitored. Check the plastic periodically for any holes and repair immediately. The goal is to raise the temperature to a lethal level through a greenhouse effect. Plastic or no plastic, place logs only one layer high. Removal to a safe site is more effective than solar treatments and should be done whenever possible.

**Control (Mechanical):** Mechanical treatment of infested trees (i.e. cutting, bucking and splitting, chipping, peeling, or burning) can be done year round. Care should be taken when cutting during June through September to minimize beetle attraction to the area by freshly cut wood (hatched area on table). Removing large wood to a safe site (see Removal to a Safe Site) and chipping or removing slash from the site will reduce this risk. *Note: Do not stack freshly cut wood against living trees, beetles are often attracted to these piles and may attack and kill the standing live trees.*

**No Greenwood Cutting:** The cutting of live trees is not recommended during the period of June through September. Cutting during this time may attract beetles to the area, especially if the slash and/or wood are to remain on site.

**Removal to a Safe Site:** If solar treatment has not begun by April 1st, sufficient time is not available to kill off the beetles in the wood before the flight begins unless the wood is covered with 6 mil clear plastic.(see above "Control Solar") Plastic is difficult to work with and not very efficient when covering many logs.

In this instance, wood cut on or after April 1st must be hauled to a safe site. Safe sites are at least 1 mile in all directions from any MPB susceptible host tree, i.e. ponderosa, lodgepole, pinon, or limber pines.

**Note:** *For detailed information please refer to, "Fact Sheet 5.528, Mountain Pine Beetle," "Preventive Spraying for Mountain Pine Beetle," and "Solar Treatment of Mountain Pine Beetle Infested Trees." These publications are available from the Colorado State Forest Service.*

# TREATMENT OF MPB INFESTED TREES

*SUCCESSFULLY INFESTED TREES CAN ALLOW MPB POPULATIONS TO INCREASE. EMERGING BEETLES FROM ONE TREE MAY ATTACK AND KILL TWO OR MORE TREES.*

***TO TREAT INFESTED WOOD:***

- BURY AT LEAST 8 INCHES DEEP
- BURN IN A FIREPLACE OR WOOD STOVE PRIOR TO NEXT SEASONS' EMERGENCE WHICH OCCURS JULY-SEPTEMBER
- PILE AND BURN (FOLLOW COUNTY REGULATIONS)
- HAUL TO A "SAFE SITE" (MINIMUM OF ONE MILE FROM OTHER PINES)
- DEBARK EITHER BY MACHINE OR BY HAND. IF DONE BY HAND IT IS MOST EFFECTIVE IN THE LARVAL OR PUPAL STAGES
- GRIND WITH A CHIPPER OR TUB GRINDER
- SOLAR TREATMENT

SOLAR TREATMENTS MAY BE EFFECTIVE BUT TIMING AND EXPOSURE TO DIRECT SUNLIGHT ARE CRITICAL. INFESTED TREES DETECTED FROM OCTOBER THROUGH APRIL CAN BE CUT, BUCKED TO MANAGEABLE LENGTHS AND EXPOSED TO THE SUN. LOGS MUST BE PLACED SIDE BY SIDE, NOT STACKED. TO MAXIMIZE SOLAR HEATING THE LOGS SHOULD BE ROLLED PERIODICALLY TO ASSURE ALL SURFACES ARE EXPOSED TO DIRECT SUNLIGHT. **BEETLES DIE FROM DEHYDRATION.**

INFESTED TREES CUT IN APRIL CAN BE BUCKED INTO SHORTER LENGTHS (MAXIMUM 24"), WETTED AND COVERED WITH CLEAR PLASTIC 6 MILLS THICK. **BEETLES DIE FROM INCREASED TEMPERATURE AND FUNGAL GROWTH.**

WITH BOTH OF THESE METHODS, CHECK UNDER THE BARK IN LATE JUNE FOR LIVE BEETLES (LARVAE, PUPAE, OR ADULTS) – IF FOUND, FURTHER ACTION WILL BE NECESSARY TO PREVENT BEETLE EMERGENCE.

PREVENTATIVE SPRAYING CAN BE EFFECTIVE FOR HIGH VALUE TREES. CHEMICAL APPLICATIONS OF CARBARYL (SEVIN) OR PERMETHRIN (ASTRO AND OTHERS) MADE JUST PRIOR TO, AND OR DURING ADULT FLIGHT, MAY PROHIBIT INFESTATION. SPRAY MUST BE APPLIED TO ALL TRUNK SURFACES UP TO A 6" TOP.

Disclaimer: County restrictions and local covenants may preclude some treatment options.

# Slash Management with Regard to Ips Beetle

In the last several years the drought that has persisted in Colorado and the West has created ideal conditions for many bark beetle populations to increase in size. As their numbers expand our ponderosa forests will be at risk to infestations that may seem unusual but in reality should be expected relative to the severity of the drought and stand conditions.

Of particular interest in the Woodland Park district (Teller, Park & El Paso Counties) are several species of Ips beetle. *Ips confusus* attacks pinion pine and some mortality has occurred in the Garden of the Gods area and up Ute Pass. *Ips hunteri* has caused considerable damage to our Colorado blue spruce in landscapes of Colorado Springs. Several other species, *Ips latidens, calligraphus* and *pini* have damaged and killed many ponderosa especially those infected with dwarf mistletoe. (For more information on Ips please see CSU handout #5.558, *Ips Beetle* by Cranshaw and Leatherman)

Ips beetles have short life cycles, only 8 weeks, and depending on the weather may produce as many as 4 generations per year between April and October. Compare this with the more familiar mountain pine beetle (Mpb) that has only one generation per year. Ips beetle activity begins by mid-April. This is the emergence of the adults that were laid as eggs the previous fall, usually around September/October.

This first generation will begin to infest stressed trees; fresh cut green logs/trees and the associated slash. This is different from MPB in several ways. Mpb *must* have standing (vertical), live, green trees that are in excess of 6 inches in diameter. Ponderosa Ips beetle doesn't make that distinction. They can infest any green material that is larger than one inch in diameter, slash (branches and crown of the tree removed from the stem), individual branches or portions of the living crown, the whole tree (even those greater than 24" in diameter) and freshly split green firewood. Therefore some special recommendations are in order.

- Expect the drought to continue that drives the conditions that are conducive to bark beetle attack.
- Expect colonization of all fresh green material by ponderosa ips
- Ips beetles have an 8-week life cycle with the first generation emergence in mid-April. That means there will be another mid-June, another in mid-August and perhaps another by the middle of September.
- Ips beetle infested material may be treated in the following ways:
    1) Grinding or chipping the logs and slash. If the brood is not crushed in the process then exposure will finish them off.
    2) Transport the material to a safe site further than 1 mile to forested acreage
    3) Pile and burn the infested material – may not be permissible in the near future
    4) Bury the material greater than 8" deep
    5) Debark the logs – impractical with small branches and slash
    6) Treat with diesel fuel – for instructions see USDA handout "Diesel Fuel Oil for Increasing MPB Mortality in Felled Logs" by Mata, Schmid & Leatherman
    7) Unlike MPB; solar treatments with or without clear plastic will be ineffective because of the short life cycle of ips beetle
- If you cut green material after mid October when Ips are not active, your material may still be colonized by Ips in mid April during the first emergence. If that happens, you have until that brood matures by mid June to treat the material.
- If you cut green material between April and October when Ips is most active, then you will have 8 weeks from the day you cut that material to properly dispose of it.
- Green material may stay green enough for colonization for up to six months especially if it has been stored in shade at high elevations.

## *SOME NEW THINKING ON THE MANAGEMENT OF GAMBEL (SCRUB) OAK FOR WILDFIRE HAZARD MITIGATION*

Fuel, topography and weather conditions determine how wildfires burn. This is called fire behavior. Since we cannot, and usually do not, want to modify the topography or lay of the land on a large scale and weather changes are beyond our control, then modifying the amount and/or arrangement of fuel (woody and herbaceous vegetation) is about the only option we have to influence fire behavior. Fire behavior specialists look at fuel type (grass, shrubs or trees and what species of these are present), fuel loading (amount measured in tons per acre), continuity (how close fuels are to one another) and arrangement ( exposure to the air) when assessing how hot a fire will burn. The more heat produced, the faster the fire will spread and hence exhibit extreme fire behavior.

Gambel Oak thrives on the dry hillsides along Colorado's Front Range. While desirable as a soil-holding plant, it also plays a major role in fueling large wildfires. This species sprouts readily from an extensive root system, making it very difficult to completely remove from an area except by root system destruction by chemical or mechanical methods . In fact cutting alone stimulates sprouting by allowing sunlight to the ground! While it is still recommended to remove all Oak Brush within 10 feet of houses (including decks), new research indicates that a combination of removing dead stems, thinning smaller stems in the clump and pruning up large diameter trunks to make a more tree-like appearance with a closed leaf canopy that still shades the ground accomplishes two important mitigation objectives in a home's defensible space zone:

1. Removing the dead wood immediately takes away readily flammable fuel. (*Reduces fuel loading).*
2. Thinning and pruning also reduce the amount of fuel but, more importantly, eliminate a fuel "ladder" for the fire to move from the ground where it is easy to control to the tops of brush and adjoining trees where control is difficult. (*Breaks up fuel continuity).*

Specific questions regarding the creation of defensible space can be addressed to the Colorado State Forest Service at (719) 687-2921 or e-mail at csfswpd@rmi.net

# FORESTRY

## Forest Home Fire Safety no. 6.304

*by F.C. Dennis* [1]

### Quick Facts...

Take steps now to protect your home from a future wildfire. This can spell the difference between your property's destruction or survival.

During a wildfire, law enforcement officials may ask you to evacuate with little warning. Take precautions now to prepare for that possibility.

Even if you are forced to evacuate your home, there are some things you can do to help firefighters defend it.

### Fire Protection in Rural Areas

Colorado's rural areas are undergoing increasingly greater development. More people are building homes in forests or brushlands to take advantage of these natural environments.

Often, these sites are quite remote. However, people moving from urban settings expect traditional fire and emergency services. They do not understand the fire protection limitations that exist in rural areas:

- Most rural fire departments are volunteer. Firefighters are not generally present at the fire stations. In addition, the number of firefighters able to respond may be limited, especially during daytime hours during the traditional work week.
- Response time may be quite long. Volunteers must reach the fire station from home or work, start the fire vehicles and drive to the fire scene. The fire scene may be quite far from the station.
- Water supplies and firefighting equipment are limited. Often, the only significant water supply is that which the fire trucks themselves carry. Water shuttles or refill locations must be established and coordinated.
- Approaching the fire scene may be difficult. Narrow, steep roads and driveways may limit or even prevent access by emergency equipment. Bridges may have weight limitations that prevent large trucks and tankers from reaching the fire.

When wildfire does strike, it can occur with little warning and spread quickly. Fire crews and equipment often are overwhelmed by the task of fighting a rapidly advancing wildfire. There may simply not be enough personnel and equipment to defend every home.

### Homeowner Preparations

Homeowners can do a great deal to prepare their property for wildfire. Some of these things are detailed in these fact sheets:

6.302, *Creating Wildfire-Defensible Zones;*
6.303, *Fire-Resistant Landscaping*;
6.305, *FireWise Plant Materials*; and
6.306, *Grass Seed Mixes to Reduce Wildfire Hazard.*

The following checklist and guidelines will help you prepare for fire safety, evacuation and home defense. Use it as a guide to enhance homesite safety.

**This is an annual checklist. Don't wait until a fire is approaching to perform these tasks.**

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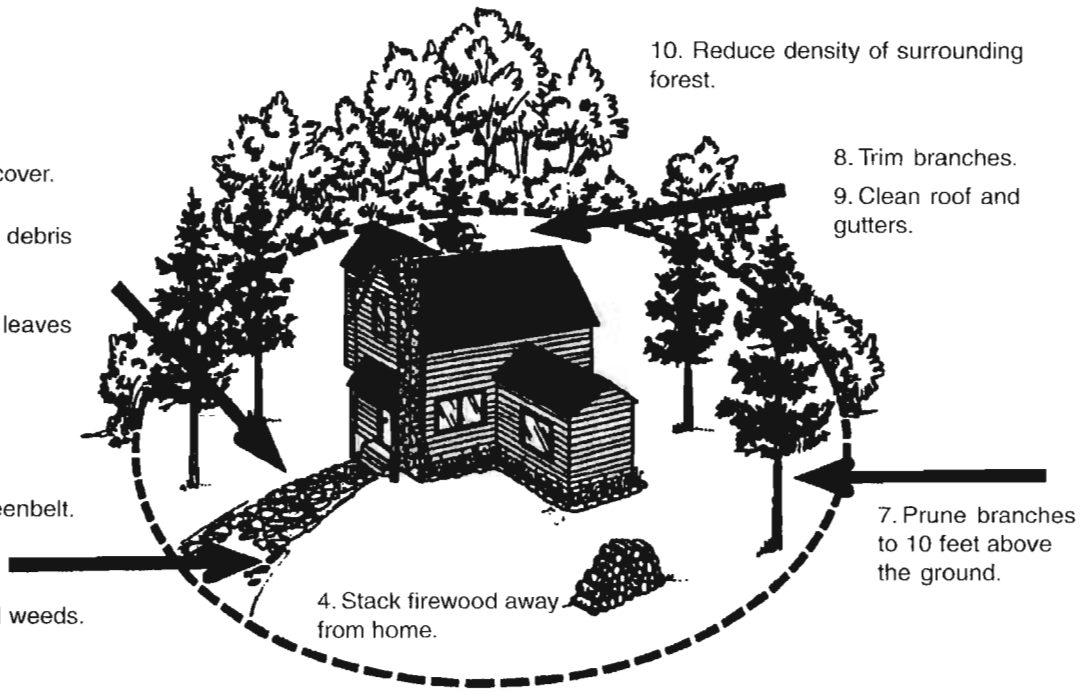
## Annual Fire Safety Checklist

- ❒ Thin trees and brush properly within the defensible space.
- ❒ Remove trash and debris from the defensible space.
- ❒ Remove any trees growing through the porch.
- ❒ Clear roof and gutters of leaves and debris.
- ❒ Remove branches overhanging chimney and roof.
- ❒ Stack firewood uphill or on a contour away from the home.
- ❒ Use noncombustible roof materials.
- ❒ Place shutters, fire curtains or heavy drapes on windows.
- ❒ Place screens on foundation and eave vents.
- ❒ Enclose sides of stilt foundations and decks.
- ❒ Use a chimney screen or spark arrester.
- ❒ Clear vegetation around fire hydrants, cisterns, propane tanks, etc.
- ❒ Make sure an outdoor water supply is available, with hose, nozzle and pump.
- ❒ Make sure fire tools, ladder and fire extinguishers are available.
- ❒ Post address signs that are clearly visible from the street or road.
- ❒ Make sure the driveway is wide enough for fire trucks and equipment.
- ❒ Post load limits on bridges.
- ❒ Install and test smoke detectors.
- ❒ Practice a family fire drill and evacuation plan.

*This is an annual checklist. Don't wait until a fire is approaching to perform these tasks.*

## Evacuation Tips

- ❒ If a wildfire is threatening your area, listen to your radio for updated reports and evacuation information.
- ❒ Confine pets to one room and make plans to take care of them in the event of evacuation.
- ❒ Arrange for temporary housing with a friend or relative whose home is outside the threatened area. Leave a note in a prominent place in your home that says where and how you can be contacted.
- ❒ If your home is threatened by wildfire, you will be contacted and advised by law enforcement officers to evacuate. If you are not contacted, or you decide to stay and help defend your home, evacuate pets and any family members not needed to protect your home.




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

- ❒ Remove important documents, mementoes, etc., from the possible fire area.
- ❒ When evacuating, wear protective clothing: sturdy shoes, cotton or woolen clothing, long pants, a long-sleeved shirt, gloves, and a handkerchief to protect your face.
- ❒ Choose a route away from the fire if possible. Watch for changes in the speed and direction of the fire and smoke.
- ❒ Take a disaster supply kit containing:
  - a supply of drinking water;
  - one change of clothing and footwear for each member of the family;
  - a blanket or sleeping bag for each person;
  - a first aid kit that also includes any prescription medications;
  - emergency tools including a battery-powered radio, flashlight and extra batteries;
  - an extra set of car keys and credit cards, cash or traveler's checks; and
  - extra pairs of eyeglasses and other special items for infant, elderly or disabled family members.

## Defending Your Home

Whether you choose to stay to defend your home or to evacuate, complete as many of the following preparations as possible.

- ❒ Do not jeopardize your life. No material item is worth a life.
- ❒ Wear fire-resistant clothing and protective gear.
- ❒ Remove combustible materials from around structures.
- ❒ Close or cover outside vents and shutters.
- ❒ Position garden hoses so they reach the entire house. Have the hoses charged, with an adjustable nozzle, but turned off.
- ❒ Place large, full water containers around the house. Soak burlap sacks, small rugs or large rags in the containers.
- ❒ Place a ladder against the roof of the house on the opposite side of the approaching wildfire. Place a garden hose near the ladder, prepared as described previously.
- ❒ Place portable pumps near available water supplies, such as pools, hot tubs, creeks, etc.
- ❒ Close all windows and doors. Do not lock them.
- ❒ Close all inside doors.
- ❒ Turn on a light in each room and all outside lights.
- ❒ Leave them on even during daylight hours.
- ❒ Fill tubs, sinks and any other containers with water.
- ❒ Shut off the gas at the outside meter of the propane tank.
- ❒ Remove lace, nylon or any other drapes and curtains made from light material. Close Venetian blinds, heavy drapes or fire-resistant window coverings.
- ❒ Move overstuffed furniture into the center of the house, away from windows and sliding glass doors.
- ❒ Park your car in the garage, facing out. Close the windows but do not lock the doors. Leave the keys in the ignition.
- ❒ Close the garage door but leave it unlocked.
- ❒ Disconnect the automatic garage door opener.

Colorado State FOREST SERVICE

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

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

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# FORESTRY

## Creating Wildfire-Defensible Zones no. 6.302

*by F.C. Dennis* [1]

### Quick Facts...

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

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

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

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

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

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

### Defensible Space

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

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

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

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

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

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

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

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*Putting Knowledge to Work*

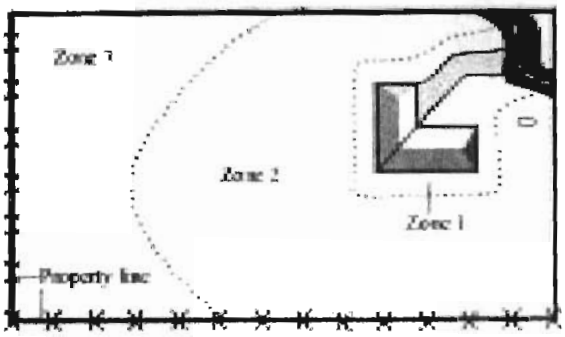


Figure 1: Forested property showing the three fire-defensible zones around a home or other structure.

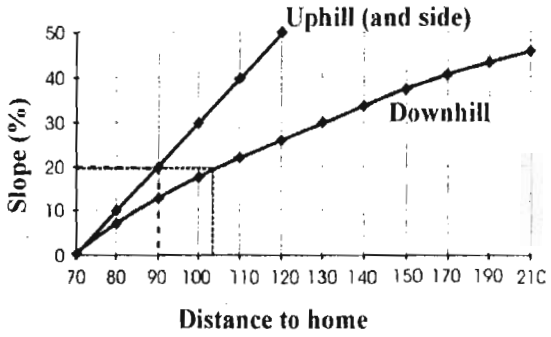


Figure 2: This chart indicates the *minimum recommended* dimensions for defensible space from the home to the outer edge of Zone 2. For example, if your home is situated on a 20 percent slope, the minimum defensible space dimensions would be 90 feet uphill and to the sides of the home and 104 feet downhill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

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

## Defensible Space Management Zones

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

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

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

## Prescriptions

### Zone 1

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

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

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

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

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

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

## Zone 2

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

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

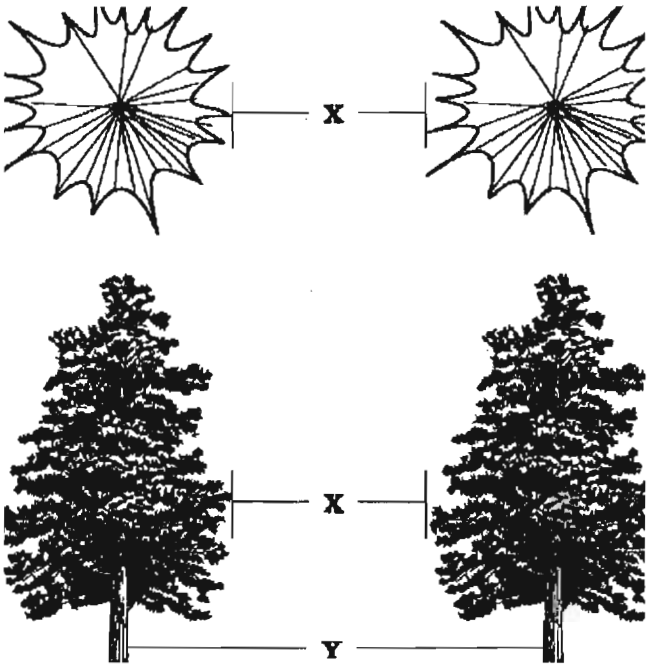


Figure 3: X = crown spacing; Y = stem spacing. Do not measure between stems for crown — measure between the edges of tree crowns.

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

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

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

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

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

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

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

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

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

Figure 4: Minimum tree crown and shrub clump spacing.

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

Figure 5: Minimum tree spacing for Zone 3.

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

### Zone 3

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

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

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

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

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

Mowing is not necessary in Zone 3.

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

## Special Recommendations

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

### Brush and shrubs

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

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

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

### Grasses

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

### Windthrow

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

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

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

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

Figure 6: Minimum defensible space size for grass fuels.

## Maintaining Your Defensible Space

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

### Defensible Space and FireWise Annual Checklist

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

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

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

## References


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

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

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

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


FIREWISE Community Fire Prevention Partnership



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

Colorado State FOREST SERVICE

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

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