COMMUNITY WILDFIRE PROTECTION PLAN

SUNSHINE FIRE PROTECTION DISTRICT

2008

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Sunshine Fire Protection District
Community Wildlife Protection Plan

Stakeholders Signature Page

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Acronyms and Abbreviations

BLM	United States Department of Interior Bureau of Land Management
CSFS	Colorado State Forest Service
CWPP	Community Wildfire Protection Plan
FPD	Fire Protection District
FWS	United States Fish and Wildlife Service
GIS	Geographic Information System
GPS	Global Positioning System
HFI	Healthy Forest Initiative
HFRA	Healthy Forest Restoration Act of 2003
ISO	Insurance Services Organization
SFPD	Sunshine Fire Protection District
SRCA	Southern Rockies Conservation Alliance
USFS	United States Forest Service
WUI	Wildland-Urban Interface

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Introduction

Decades of aggressive fire suppression in fire-dependent ecosystems, coupled with a strong demographic shift to the western and southwestern states, persistent drought, disease and insect infestation, have all converged to create a threat that is increasingly commanding both national attention and substantial resources. Following a particularly bad fire season in 2000, Congress put forth The *National Fire Plan* and the *Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy*. The intent of these programs was to enable effective response to severe wildland fires and to better address their impact on communities.

In response to the Healthy Forest Restoration Act (HFRA) in 2003 and in an effort to create incentives, Congress directed interface communities to prepare a *Community Wildfire Protection Plan* (CWPP). Once completed, a CWPP provides statutory incentives for the US Forest Service (USFS) and the Bureau of Land Management (BLM) to give consideration to the priorities of local communities as they develop and implement forest management and hazardous fuel reduction projects.

The CWPP provides a coordinated assessment of neighborhood wildfire risks and hazards, and outlines specific mitigation treatment recommendations designed to make the Sunshine Fire Protection District (SFPD) a safer place to live, work and play. Specifically, it is a strategic plan that identifies specific wildland fire hazards and risks facing communities and neighborhoods, and provides prioritized mitigation recommendations that are designed to reduce those hazards and risks in the Wildland-Urban Interface (WUI).

The WUI is defined as a geographical area where human habitation and their developments intermix with wildland or vegetative fire fuels. This human development may consist of both interface and intermix communities. Typically, these communities meet or exceed housing densities of one structure per five acres, with natural vegetation coverage of at least 50% of the land area. The typical boundaries of a WUI exist without reference to municipal city limits or urban growth boundaries.

As more people choose to reside in areas of natural vegetation, the propensity for large-scale wildfire increases with the corresponding loss of human life and property. Home construction within or adjacent to the WUI creates the potential for an increase in fire ignitions of wildland fuels, or conversely the loss of homes from wildfires burning into developed areas. Experience has proven that these catastrophic losses do not occur in those areas within the WUI where wildland fire fuels are effectively managed by homeowners. The comprehensive thinning and on-going management of wildfire fuels in proximity to homes is a key tool used to prevent loss of homes and lives.

The CWPP development process can be a significant educational tool for people who are interested in improving the environment in and around their homes. It provides ideas, recommendations and guidelines for creating defensible space around the house and ways to reduce structural ignitability through home improvement and maintenance. It should be noted that the CWPP is a living document to be revisited on a regular basis and revised as needed.

Section 1: Fire History

Historically, wildfires have left Sunshine Fire Protection Protection District (SFPD) largely unscathed; though local fire history has only been recorded since settlement in the 1850s. In 1860 a wildfire destroyed the original town of Gold Hill. Old tree rings evidence fire scars from two particularly dry years in 1858-1859 and 1859-1860 during which wildfires raged in Boulder County. While there may have been many small fires or just a few large ones during those years, it is clear that the forests in Boulder County sustained large amounts of damage. Studies of the incidence of wildfire in local Ponderosa Pine forests show wide variation, with intervals from 1 to 96 years, and average intervals of 17 to 40 years. As fire suppression efforts during the past 100 years in the foothills have contributed to dense, overgrown forests, there are significant parts of the SFPD that are long overdue for a fire.

In addition to fire suppression efforts by the USFS, local mining, ranching and suburban development may also have disrupted the local incidence of wildfire. The mining boom brought thousands of men to the area who worked in the mines building houses, hotels, schoolhouses, saloons and mine buildings using the local timber. They littered the landscape with mine tailings and temporarily limited the wildfire threat by eliminating the forest. Though the tree populations during those mining days were much lower, these and other historical events have led to a current forest characterized by the dense growth of similar aged trees.

As the mountains near Boulder have been developed since about 1960, there has been increasing pressure for effective fire suppression. Increased property values and growing populations have led to the establishment of fire protection districts taking responsibility for the populated and accessible portions of Boulder County. SFPD was organized in 1969. It began with community-donated work and surplus equipment. In recent years the growing tax base and community awareness of fire hazard have made it possible to acquire modern firefighting equipment and a new fire station. Mutual aid agreements with the neighboring fire districts have made the possibility of an adequate response to a large wildfire more credible. However, the SFPD has been spared from recent fires that have hit surrounding districts. All of these fires have been within 20 miles of the Sunshine Fire District, and all but a few have been within 10 miles. A partial list includes:

1. *Overland Fire*: 2003, 4000 acres burned, 31 structures destroyed; downed power line
2. *Walker Ranch Fire:* 2000, 1100 acres burned, 0 structures destroyed; human caused.
3. *Old Stage Fire*: 1990, 3000 acres burned, 15 structures destroyed; human caused
4. *Black Tiger Fire*: 1989, 2100 acres burned, 44 homes destroyed; human caused.
5. *The Lefthand Fire*: 1988, 3550 acres burned, 0 structures destroyed; human caused.

The SFPD has not been totally spared. Several lightning strikes have caused small fires that were controlled before they did major damage. A wind driven event among grasslands was also controlled before any damage to nearby structures was sustained. Several acres have also been burned along the SFPD and Boulder Mountain Fire Authority boundary in two fires, the most recent of which was in 2007 where a slash pile fire burning recent mitigation efforts smoldered undetected for several days and was fanned back to life by gusty winds, jumped Sunshine Canyon Drive and raced up the hill into the Boulder Mountain Fire Protection District. Major efforts by multiple fire districts and areas significantly fire mitigated at the top of the hill prevented this fire from reaching any structures.

Section 2: Area of Study

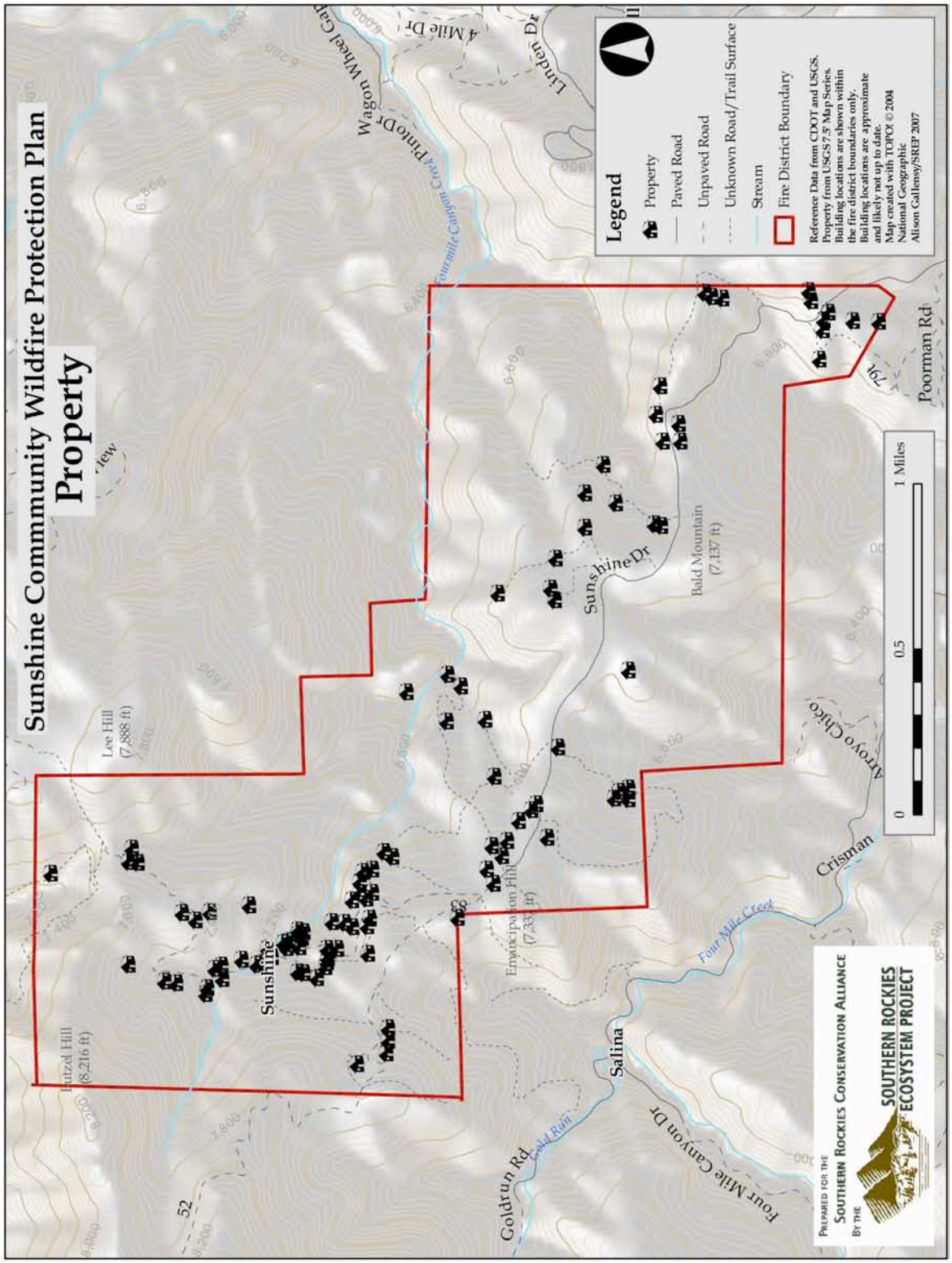
Sunshine Fire Protection District (SFPD) is located in Boulder County, in the foothills west of Boulder, Colorado. The district is bordered on the east by Boulder Rural FPD, east/northeast by Boulder Mountain FPD, north by Left Hand FPD, south by Four Mile FPD and to the west/northwest by Gold Hill FPD. SFPD covers an area of 4 square miles and has approximately 161 homes (Map 1: Property, p. 9). It includes one intermittent stream (with occasional even smaller tributaries), about 5 miles of public road and several additional miles of private roads. There are numerous mining sites within SFPD (Map 2: Historic Sites, p. 10) and is of ecological importance to a variety of plant and animal species (Map 3: Ecological Values, p. 11).

The overall topographic variation is substantial within the district including steep slopes, ravines, and chimneys (Map 4: Aspect, p.12 and Map 5: Slope, p. 13). Much of the district is high on slopes near ridges, with long stretches of unbroken fuels below. The majority of SFPD is considered to be in the Montane Zone (5500 to 9500 feet) of the eastern slope of the Northern Colorado Front Range. The dominant vegetation is composed of conifer forest comprised mainly of Ponderosa Pine and Douglas Fir (Map 6: Vegetative Cover, p.14). Open canopy of woodlands broken by large grass meadows also exist in the district. The forest, shrub lands and grasslands in SFPD have adapted to a mixture of low- and high-severity fires along a broad range of historic frequencies. It is generally acknowledged that a policy of fire suppression along the Front Range has exacerbated the potential for high-intensity wildfire.

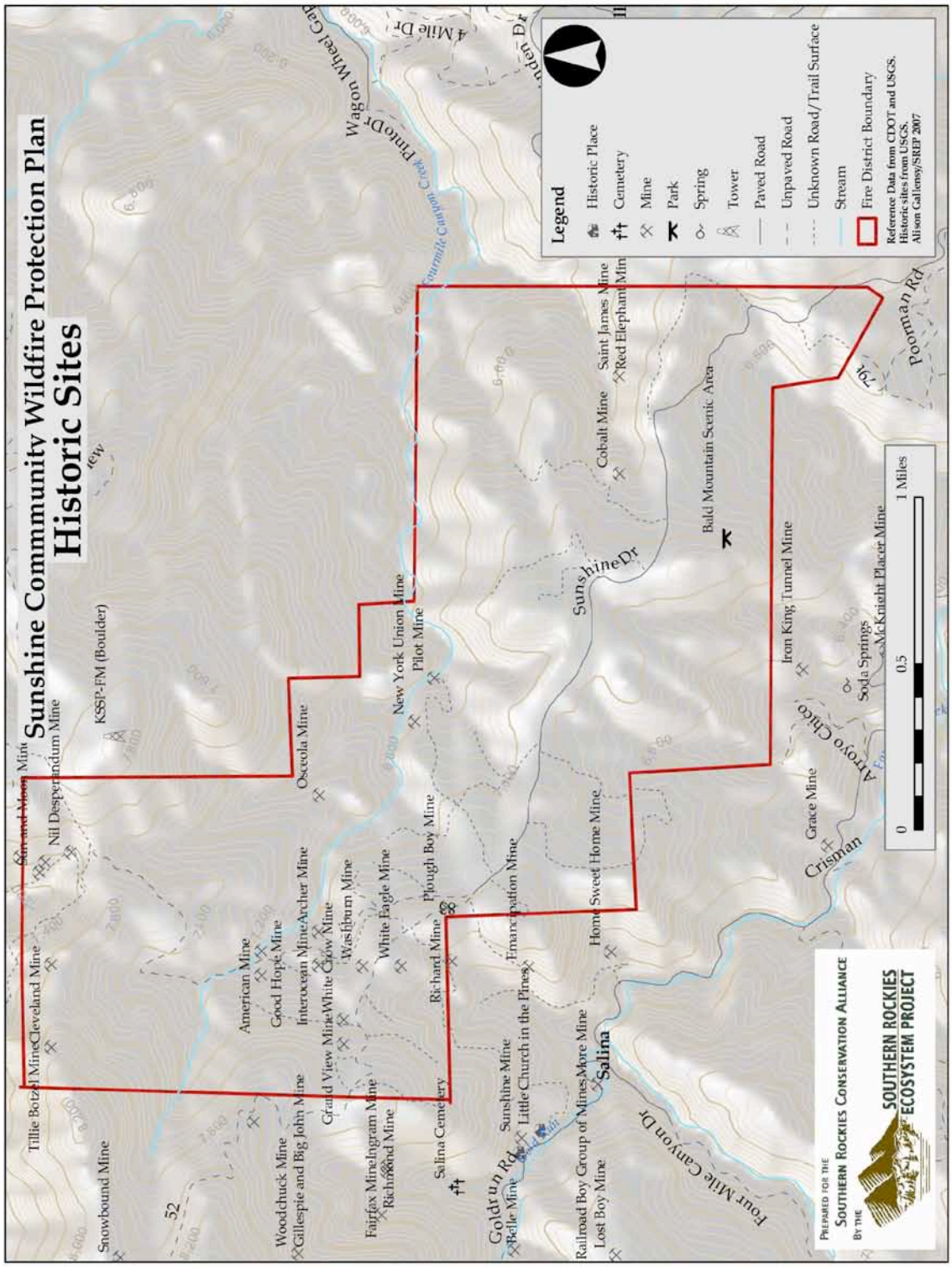
In January 2008, the United States Forest Service (USFS) stated that due to the Mountain Pine Beetle 90% of the mature lodgepole pine will be dead in Boulder County within the next three to five years. While there are high populations of Mountain Pine Beetle infestation above 8500 feet, SFPD is currently at an average level of Bark Beetle infestation. Thus far we do not know the effects that the Mountain Pine Beetle epidemic will have in Ponderosa Pine forests at lower elevations; however early efforts directed toward promoting forest health can only lessen the mountain beetle impact when they arrive. Sunshine Canyon is currently in the midst of a Dwarf Mistletoe infestation.

Dwarf Mistletoe spreads from tree to tree by shooting wind-borne spores. Dwarf Mistletoe rarely kills trees but it does cause them to grow abnormally. The resulting trees are better fuel because they have dense clumps of branches. Heavy infestations in large trees can be controlled only by cutting down the trees and removing them to stop the spread of the mistletoe to other trees nearby. Pruning can sometimes be effective on smaller trees. Furthermore, there are many dead or dying trees along the roads, particularly along the unpaved sections, possibly because of road dust or chemicals used for road maintenance. These dead fuels take up moisture much less quickly than live fuels. With time these dead fuels get dryer and dryer, making them increasingly flammable.

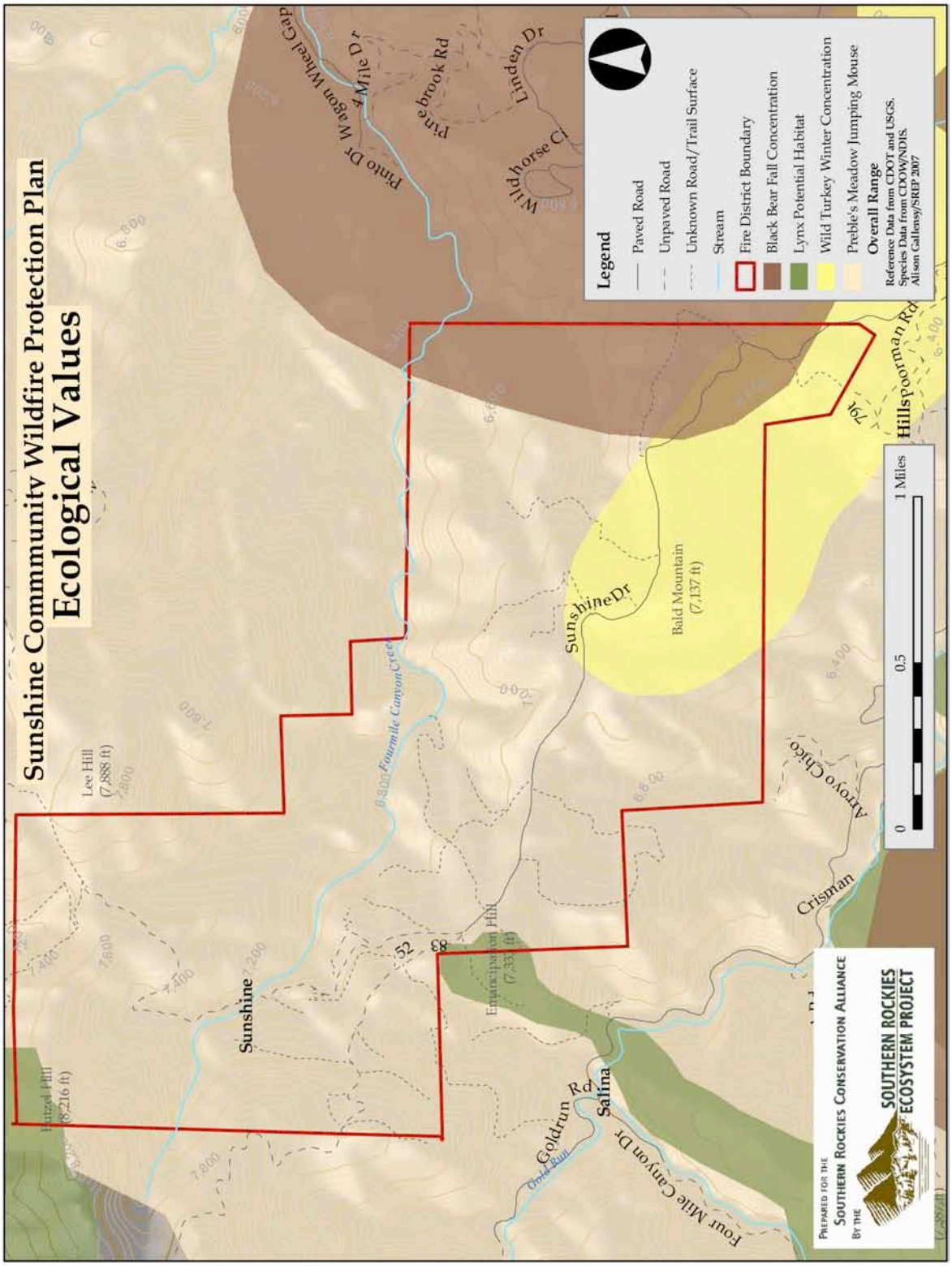
For the purposes of this report, we divided our district into six neighborhoods (Map 7: Neighborhoods, p 15). Each neighborhood has been assessed for the hazards and risks that occur inside the district boundaries. Rankings and descriptions of neighborhoods, as well as hazard and risk recommendations, only pertain to the portions of those areas that lie within the jurisdictional boundary of SFPD, unless otherwise noted.



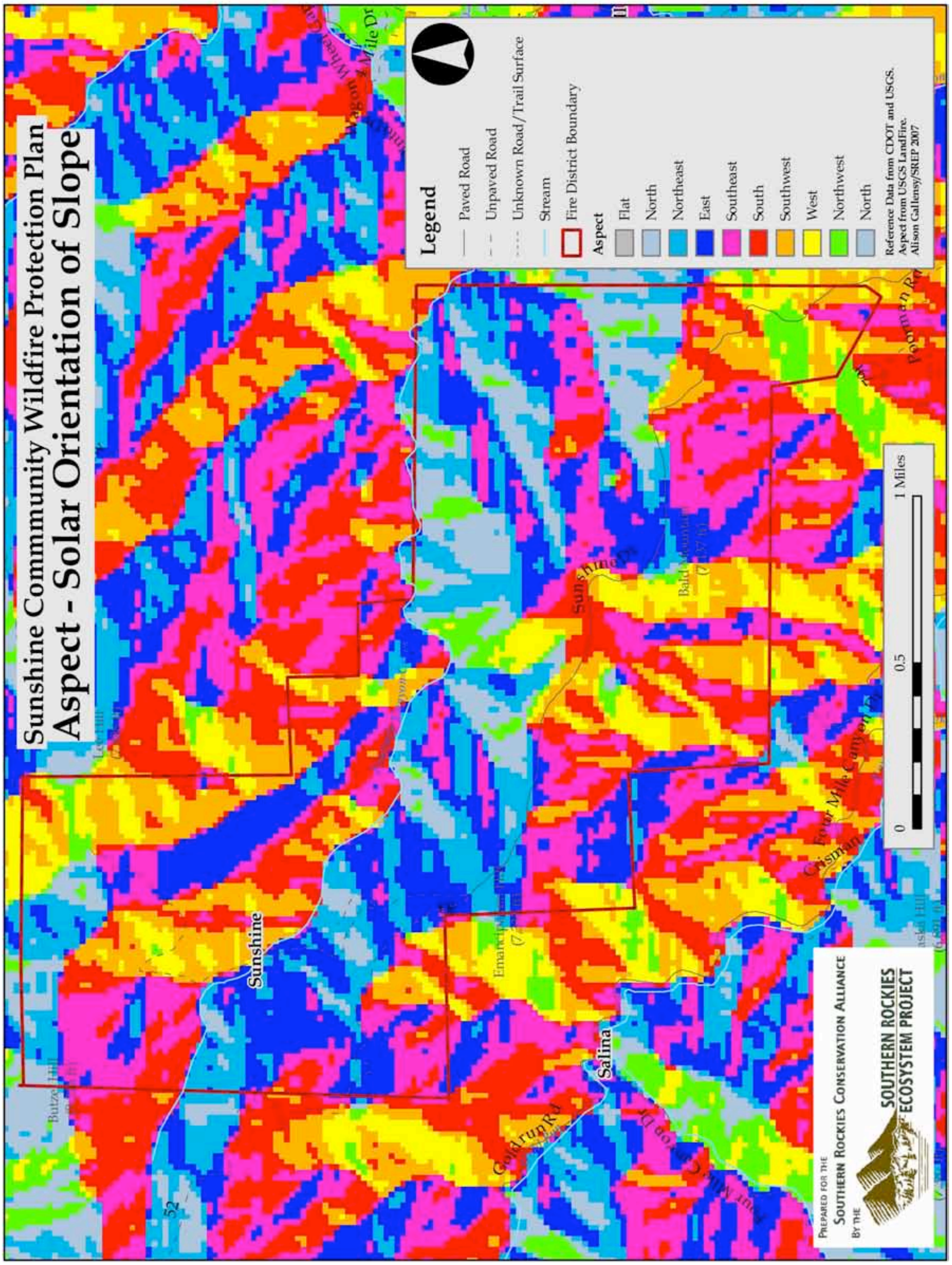
Map 1: Property Map



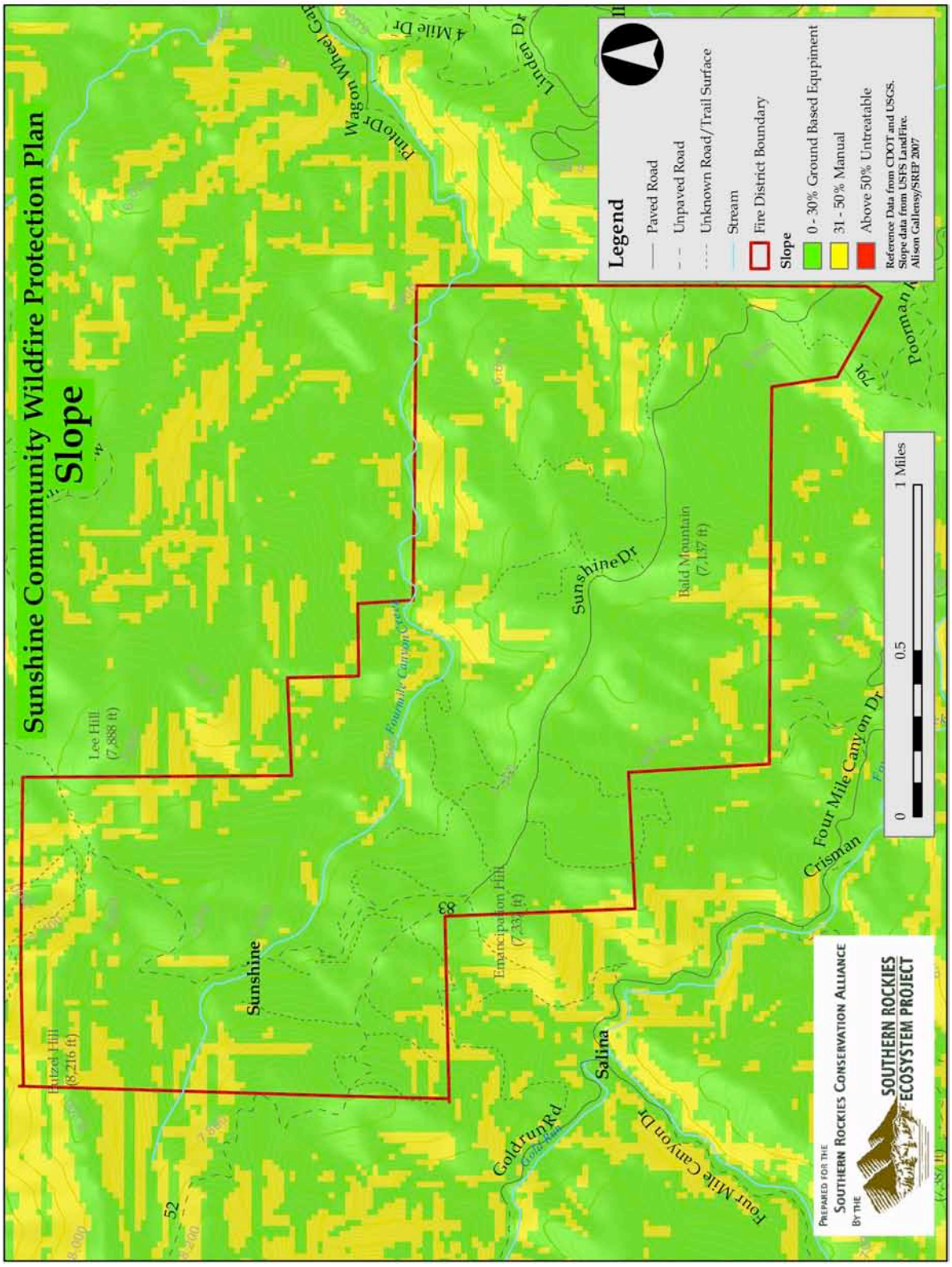
Map 2: Historic Sites



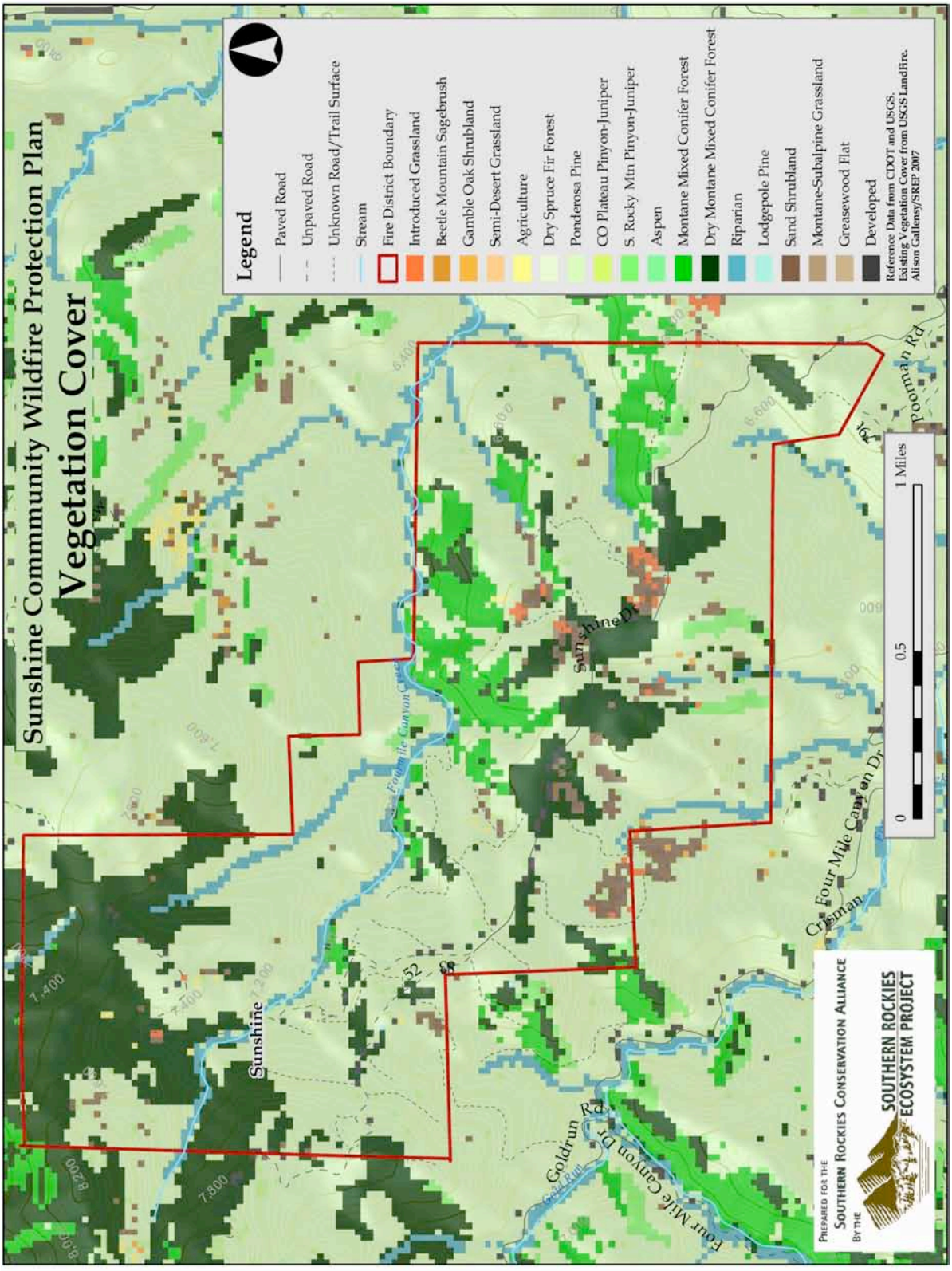
Map 3: Ecological Values


Sunshine Community Wildfire Protection Plan
Aspect - Solar Orientation of Slope
Legend
Paved Road
Unpaved Road
Unknown Road/Trail Surface
Stream
Fire District Boundary
Aspect
Flat
North
Northeast
East
Southeast
South
Southwest
West
Northwest
North
Reference Data from CDOT and USGS.
Aspect from USGS LandFire.
Alison Gallensy/SREP 2007
0
0.5
1 Miles
Sunshine
Salina
Sunshine Dr
Four Mile Canyon Dr
Gold Run Rd
Wagon Wheel Gap Rd
Poorman Rd
52
Prepared for the
Southern Rockies Conservation Alliance
By the
SOUTHERN ROCKIES ECOSYSTEM PROJECT

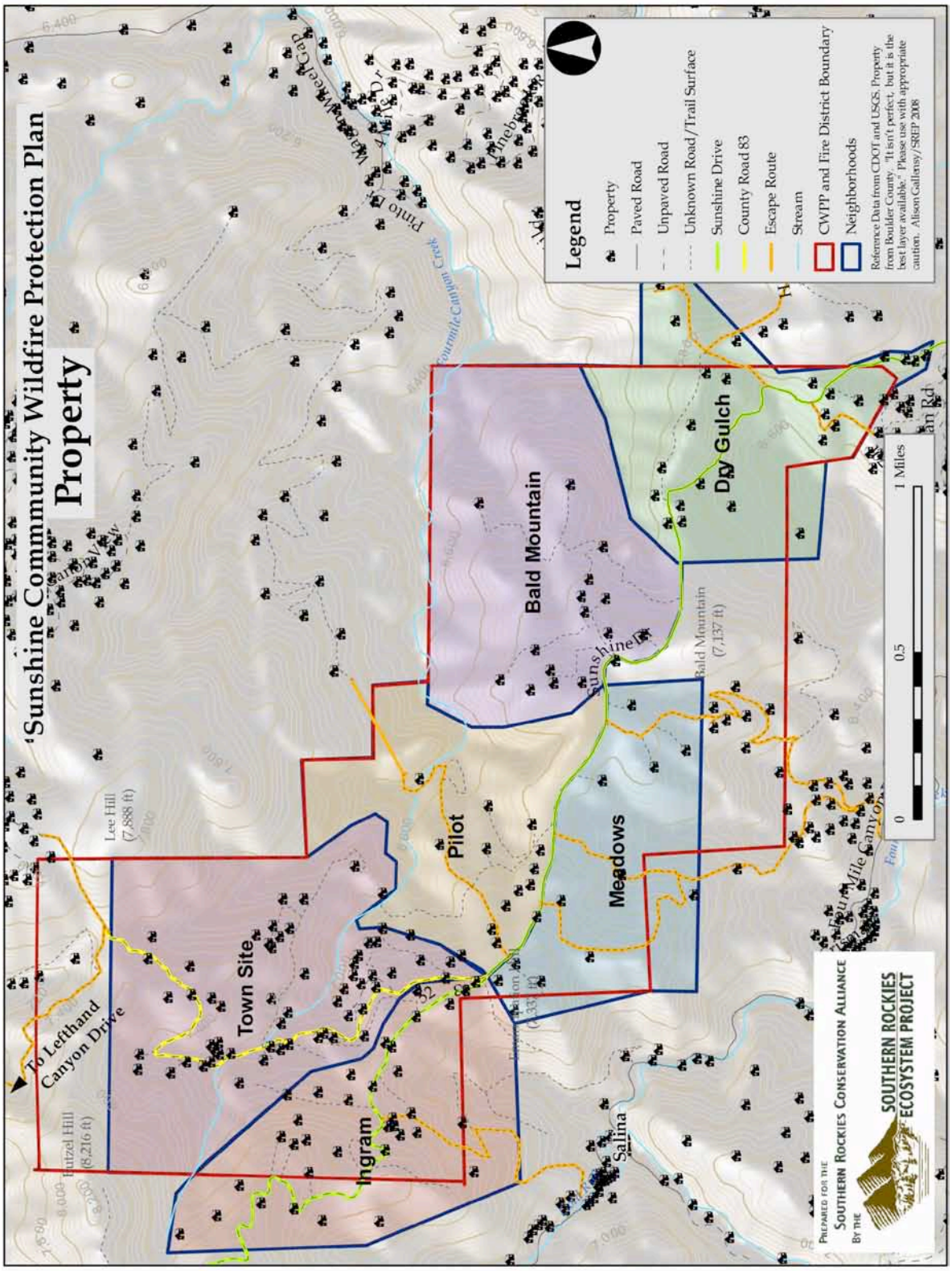
Map 4: Aspect


Sunshine Commmunity Wildfire Protection Plan
Slope
Legend
Paved Road
Unpaved Road
Unknown Road/Trail Surface
Stream
Fire District Boundary
Slope
0 - 30% Ground Based Equipment
31 - 50% Manual
Above 50% Untreatable
Reference Data from CDOT and USGS.
Slope data from USFS LandFire.
Alison Gallensy/SREP 2007
0
0.5
1 Miles
Lee Hill (7,888 ft)
Baldy Mountain (7,137 ft)
Emancipation Hill (7,330 ft)
Fatzel Hill (8,216 ft)
Sunshine
Salina
Crisman
Four Mile Canyon Dr
Sunshine Dr
Goldrun Rd
Linden Dr
4 Mile Dr
Wagon Wheel Gap Dr
Poorman Rd
Four Mile Canyon Creek
Prepared for the Southern Rockies Conservation Alliance by the
Southern Rockies Ecosystem Project

Map 5: Slope



Map 6: Vegetation Cover



Map 7: Neighborhoods

Section 3: Fire District Hazard Assessment

The Sunshine Fire Protection District (SFPD) is characterized as a classic Front Range Wildland-Urban Interface (WUI) – fire dependent ecosystem, heavily forested, interspersed with homes and subdivisions, all susceptible to catastrophic wildfires. This project provides a district-wide wildfire risk and hazard assessment based on ground surveys, GIS and forest composition mapping. The district was divided into six neighborhoods that were individually assessed by volunteer community members and rated according to standardized wildfire hazard ratings criteria. Representatives of the Colorado State Forest Service (CSFS), Boulder County and SFPD created the survey document collaboratively. Site-specific information was collected during field surveys (see **Appendix B**) in the autumn of 2007 following a training session led by Boulder County Wildfire Mitigation Officer Eric Phillips. Notes from this training session were distributed to each of the nine surveyors as a reference tool. The predominant conditions recorded during these surveys were used as the basis for the wildfire hazard ratings.

To arrive at a community assessment score, five primary factors that affect wildfire risk within a neighborhood were reviewed and evaluated:

1. Neighborhood accessibility
2. Home construction
3. Defensible space
4. Fire behavior
5. Additional hazards

Score totals from these five survey topics were fed into the hazard rating scale which assigns community risk values based on the following categories:

Hazard Rating Scale
>150 EXTREME
75 – 150 HIGH
41 – 74 MODERATE
<40 LOW

Figure 1: Hazard Rating Scale

3.1 Neighborhood Accessibility

Neighborhood accessibility and the ability of a neighborhood to physically support fire response and emergency operations were key factors in evaluating the response capability to a given neighborhood. Access that is safe and adequate is a critical component when making the decision to commit crews and apparatus to defend a community or neighborhood from an approaching wildfire. The design of roadways is an important component of the community accessibility hazard rating. Limited access implies limited escape routes if fire conditions shift and threaten operations. Factors influencing access are ingress/egress design, road width and road slope. Signage is another important component when responding to a wildland or structure fire. The easier it is to navigate a neighborhood at night or in heavy smoke, the safer it is for responding emergency personnel. Reflective and non-flammable street and address signs are preferred.

3.2 Home Construction

Home construction materials directly influence a structure's chance of survival in the event of a wildland fire. Ignition is inevitable under constant exposure to direct flame. However, the composition of construction material determines the length of time a structure can withstand high temperatures before ignition occurs. "Non-flammable" material can suppress ignition long enough to withstand a passing flame front. Coupled with a fuel free defensible Zone around the home, chances of survival are greatly increased.

Architectural design also influences a home's fire risk. Unenclosed decks and balconies often provide drafty spaces for embers and fire brands to smolder adjacent to homes leading to structural ignition. Unenclosed eaves also pose a similar risk. Primary rating factors included:

1. Roofing material
2. Siding material
3. Deck enclosures

3.3 Defensible Space

The condition of individual parcels within a neighborhood with respect to ease of access, and the fuel load conditions adjacent to the home and the surrounding property are key factors in site hazard assessments. Four physical factors were surveyed for each home within a neighborhood and included driveway length or access, adherence to current defensible space practices, presence of ladder fuels and forest density, and the potential for extreme fire behavior due to a closed forest canopy. Of particular importance is the notion that extensive landscaping activities without effective thinning will not affect canopy condition.

Defensible space is a critical component of wildfire hazard risk. Minimum recommended defensible space for flat terrain is a 30 foot perimeter of cleared space around the home. Steeper slopes require a fuel break of up to 125 feet from the home due to higher flame lengths associated with steeper terrain. In addition to clearing fuels adjacent to the home, fire hazard can be greatly reduced by expanding fuel reduction to the entire property. Primarily this involves limbing, thinning and removing excess vegetation from the forest floor. Such mitigation efforts can have a dramatic impact on a structure's survivability. Community-wide mitigation efforts will positively impact the entire neighborhood's wildfire survivability in many ways including:

1. Slow the fire's progress by reducing available fuels
2. Reduce the intensity of fire behavior
3. Force a crown fire onto the ground by breaking a continuous crown stand and creating effective fuel breaks
4. Remove ladder fuels, keeping the fire on the ground within the home's perimeter
5. Effectively enable 30+ foot home defensive Zone to protect a structure without fire apparatus present

3.4 Fire Behavior

Fire risk is the probability that wildfire will start from natural or human-caused ignitions. Fire hazard is the presence of ignitable fuel coupled with the influences of topography and weather, and is directly related to fire behavior (Figure 2). The characteristics of fuels, topography and weather conditions combine to dictate fire behavior, rate of spread and intensity. Wildland fuel attributes refer to both dead and live vegetation, and include such factors as density, continuity, vertical arrangement and moisture content. Different types of vegetation will react uniquely but predictably in fire conditions and pose a variety of threats to emergency response personnel. Structures with flammable materials are also considered a fuel source.

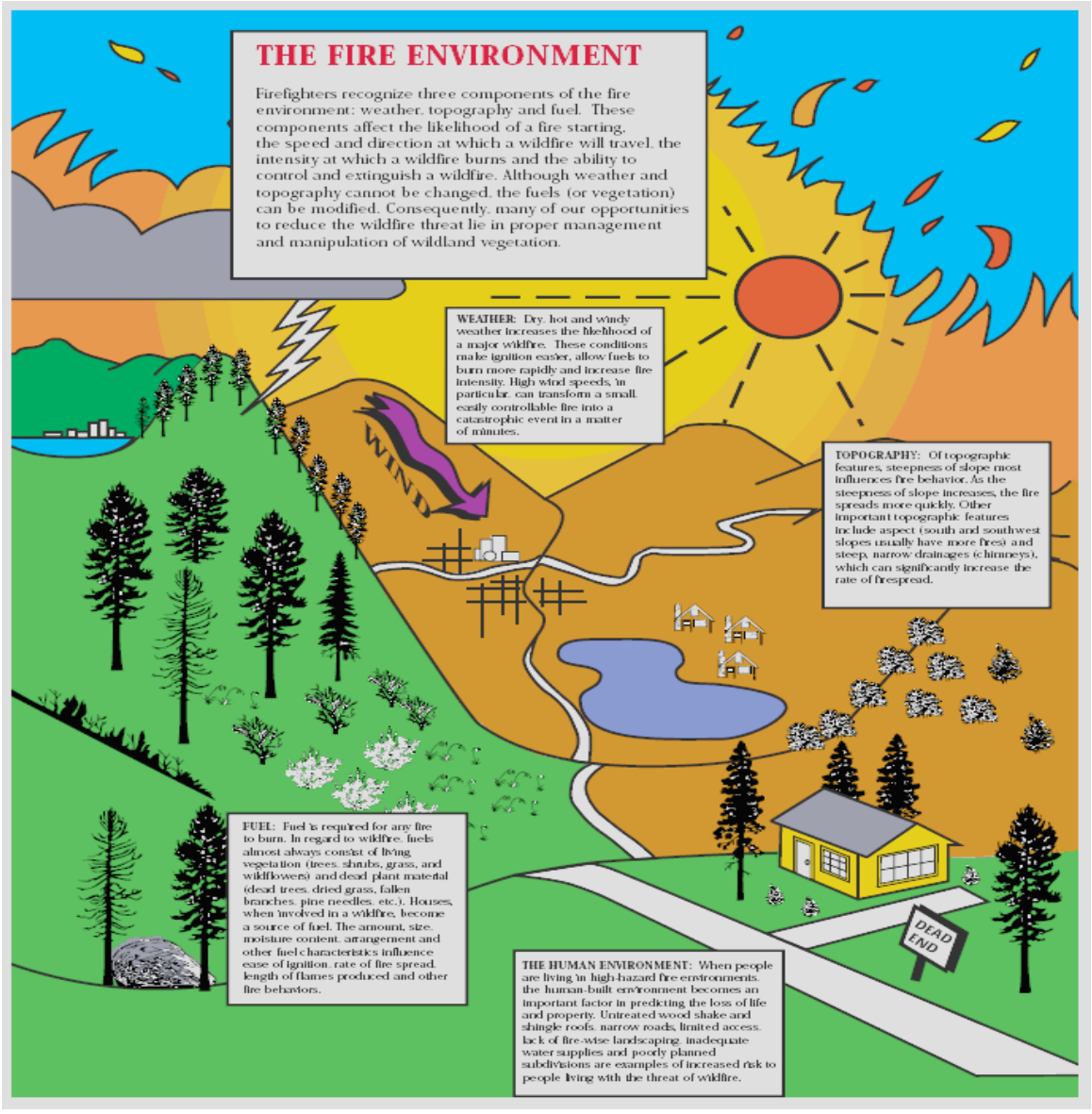


Figure 2: Interaction of weather, topography, and fuels to create the fire environment. From *Living With Fire.*

Topographical variations can greatly influence fire behavior and are analyzed here for their potential impact on predicted fire behaviors within SFPD and its neighborhoods. North slopes

tend to hold moisture better than east, south and west facing slopes. Sun exposure dries out vegetation and pre-heats all fuels. Fire behavior is greatly influenced by slope steepness. Fire burns upslope with greater speed and flame lengths than on flat or gently sloping ground. Ravine and topographical chimneys tend to funnel heat, flame and smoke upslope creating extremely hazardous situations. Homes built mid-slope or on ridge lines are at greater risk than those built on flat or gently sloping terrain.

For fire to spread, materials such as trees, shrubs or structures in the flame front must meet conditions of ignitability. The conditions needed are the presence of oxygen, flammable fuel and heat. Oxygen and heat are implicitly available in wildland fire. However, if the potential fuel does not meet the conditions of combustion, it will not ignite. This explains why some trees, vegetation patches or structures may survive a wildland fire and others in the near vicinity are completely burned.

Weather conditions such as high ambient temperatures, low relative humidity and windy conditions favor fire ignition and high-intensity fire behavior. Under no-wind conditions fire burns more rapidly and intensely upslope than on level terrain. The affects of terrain can be particularly pronounced in steep narrow canyons referred to as "chimneys" due to their convective characteristics. Wind tends to be the driving force in fire behavior in the most destructive WUI fires. The "Chinook" winds common along the Front Range can rapidly drive wildfire down slope.

3.5 Additional Hazards

Knowledge of water availability and capacity is an important component of strategic suppression planning. The presence of accessible and reliable water supplies within a community will greatly impact the effectiveness of wildfire suppression tactics. The presence of above ground power lines and gas supplies pose a significant ignition threat as well as hazards during an active wildfire. Exposed and downed power lines are significant threats to firefighters and are a primary ignition threat during high wind events. Homes within neighborhoods with buried utilities mitigate these potential hazards.

3.6 Community Mitigation Recommendations

Effective wildfire mitigation reduces risk of structural ignition to the point where homes, neighborhoods and communities can survive a wildfire without the need for aggressive, last minute suppression intervention. This "best case" scenario is only achieved through a community-wide effort concentrating on intelligent planning, cooperation and follow-through. Even small steps on an individual basis will increase a home's chances of survival and help reduce the threat to the community. Mitigation recommendations focus on three primary areas of concern:

1. Site hazard mitigation: homes and immediate surroundings
2. Defensible space in an area around a home where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire toward the structure
3. Surrounding forest where fuel reduction in the adjacent forest may be necessary to effectively address wildfire risk concerns within interface neighborhoods

Section 4: Creating an Effective Defensible Space

Effective community wildfire hazard reduction centers around the idea that actions taken by residents will have the greatest impact on the chances of their home surviving a wildfire. When adjacent property owners work together, the reduction of wildfire risk is even more effective. A cooperative neighborhood with a common goal of wildfire hazard reduction can produce profound results. Sensible home construction practices and the implementation of defensible space are paramount. Simple steps, such as keeping gutters clear of pine needles, can significantly reduce the opportunity for structural ignition. Replacing roofs and siding as needed with non-combustible material is simple common sense.

Many hazards can be reduced to acceptable levels by following six simple steps:

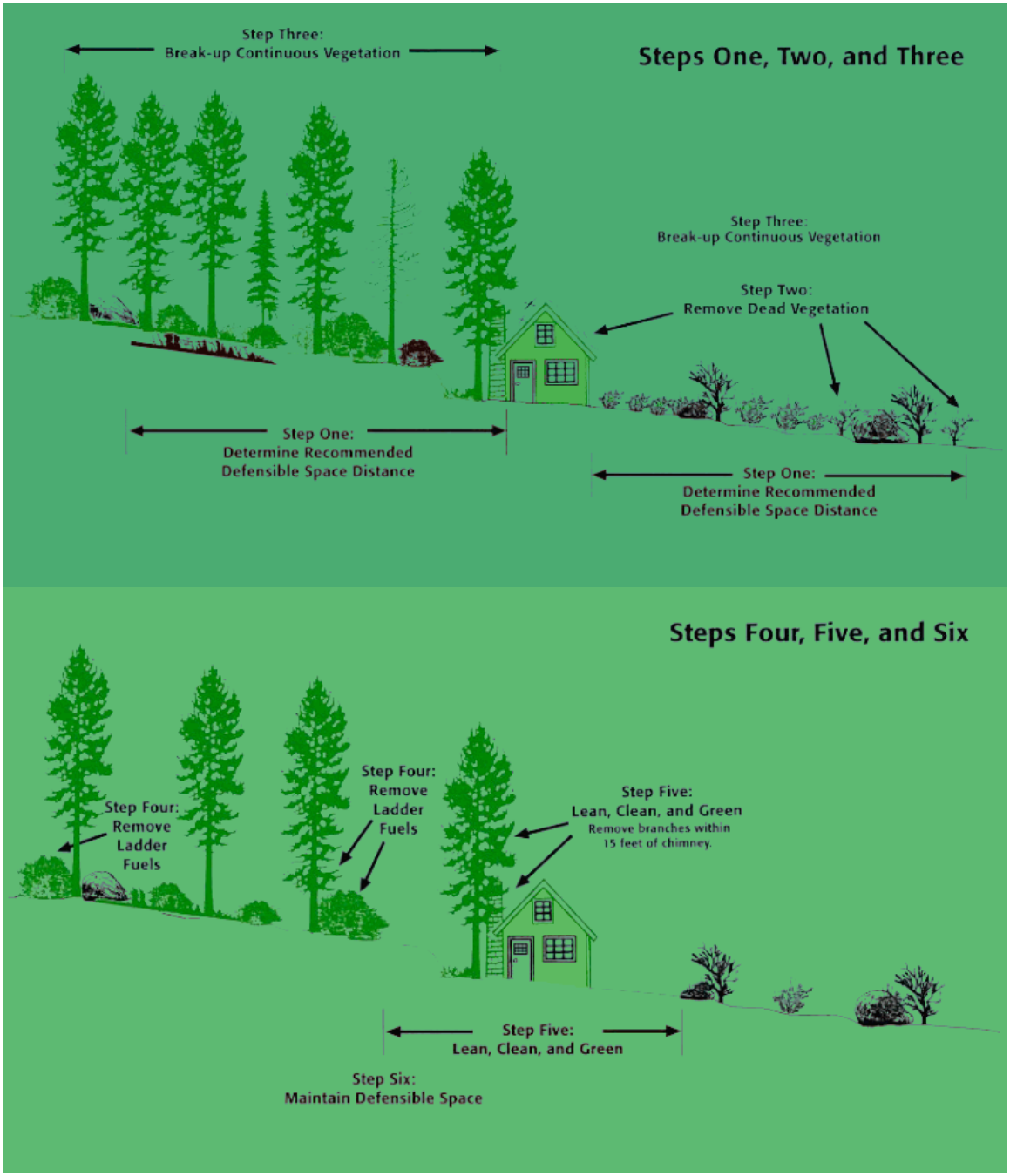
1. Determine the size of an effective defensible space. This is accomplished by determining the type of vegetation surrounding the home and the steepness of terrain. For example, if the dominant type of vegetation is shrubs, then homes situated on a flat to gently slopping hill (0-20% slope), would have a recommended defensible space distance of 100 feet. This distance doubles if the steepness increases 21% to 40%. In forested areas, the recommended distances would be 30 and 100 feet, respectively. Many of the homes in SFPD are on terrain whose steepness ranges between 10% and 40%.
2. Remove dead fuels such as dead limbs, leaves and other ground litter within the defensible space. Dispose of all limbs and branches (slash) left from thinning. Common disposal methods include chipping, pile and burn (only when snow cover is sufficient to prevent fire spread and a fire department approves) and by cutting debris into small pieces to scatter over an area in order to accelerate decomposition (lop and scatter). Figure 3 lists some recommended practices for handling dead fuels.
3. Thin out continuous tree and brush cover. Adequate thinning is reached in the defensible space when the trees crowns' outer edges are at least 10 to 12 feet apart. Tree crown spacing increases as the percentage of slope increases. For example, ideal crown spacing on a 21-40% slope would be 20 feet, while spacing for trees on a 11-15% slope would be 15 feet. Occasional clumps of 2 or 3 trees are permitted for natural effects if more space surrounds them. The recommended separation distance for shrubs and small conifers is 2-, 3-, 4-, or 6-times their height depending upon the slope of the terrain. If a home is on a slope, it is common to enlarge the defensible space on the downhill side to 100 feet from a structure. If it is located at the crest of a steep hill, fuels should be thinned at least 150 feet below the crest.
4. Prune dead branches from trees within the defensible space to a height of 8 feet above ground. Remove shrubs, small trees or other potential "ladder" fuels from beneath large trees. If such fuels are left in place they can carry a ground fire into tree crowns.

TYPES OF DEAD VEGETATION AND RECOMMENDED PRACTICE	
DEAD FUEL TYPE	**RECOMMENDED PRACTICE**
STANDING DEAD TREE	Remove all standing dead trees from within the defensible space area.
DOWN DEAD TREE	Remove all down dead trees within the defensible space area if they have recently fallen and are not yet embedded into the ground. Downed trees that are embedded into soil and which cannot be removed without soil disturbance should be left in place. Remove all exposed branches from an embedded downed dead tree.
DEAD SHRUBS	Remove all dead shrubs from within the defensible space area.
DRIED GRASSES AND WILDFLOWERS	Once grasses and wildflowers have dried out or "cured," cut down and remove from the defensible space area.
DEAD NEEDLES, LEAVES, BRANCHES, CONES (ON THE GROUND)	Reduce thick layers of pine needles to a depth of two inches. Do not remove all needles. Take care not to disturb the "duff" layer (dark area at the ground surface where needles are decomposing) if present. Remove dead leaves, twigs, cones, and branches.
DEAD NEEDLES, LEAVES, BRANCHES, AND TWIGS (OTHER THAN ON THE GROUND)	Remove all dead leaves, branches, twigs, and needles still attached to living trees and shrubs to height of 15 feet above ground. Remove all debris that accumulates on the roof and in rain gutters on a routine basis (at least once annually).
FIREWOOD AND OTHER COMBUSTIBLE DEBRIS	Locate firewood and other combustible debris (wood scraps, grass clippings, leaf piles, etc.) at least 30 feet uphill from the house.

Figure 3: Suggested practices for dealing with dead vegetation. From: *Living With Fire.*

5. Maintain a greenbelt immediately around a home using grass, flower gardens or ornamental shrubbery. An alternative is rock or other noncombustible material; avoid bark or wood chip mulch in this area. Mowing dead grasses and weeds to a low height is also useful in creating an area within the first 30 feet of a home that is "lean, clean and green". Closer to home, trimming branches which extend over the eaves, removing branches near chimneys and cleaning gutters of pine needles also reduces the opportunity for structural ignition.
6. Maintain the first 15-30 feet of defensible space and extend it further by reducing density of the surrounding forest at least 75-125 feet out from the home site. Further fuels treatment beyond these two Zones and extending beyond property lines is generally not necessary, though management efforts in this area can enhance tree health and the growth rate of the forest.

These six steps are summarized in Figures 4 (page 22).



Figures 4: Six Steps to Create Defensible Space. From: *Living With Fire*.

Additional ideas for interested homeowners, as well as further information about defensible space mitigation prescriptions, are available from the publication *Creating Wildfire-Defensible Zones* by the Colorado State Forest Service, document # 6.302. View the entire pamphlet at: **www.rockymountainwildlandfire.info/resource_files/forest_home_fire_safety.pdf**

Section 5: Habitat Effectiveness & Environmental Resources

Sunshine Fire Protection District (SFPD) residents are clear that the preservation of wildlife and the environment are important factors to the quality of life of the area. Habitat effectiveness is defined as the degree to which habitat is free of human disturbance and available for wildlife to use. Effective habitat is mostly undisturbed land area, which is buffered from regular motorized and non-motorized use of roads and trails. Wildfire, more specifically severe wildfire, can have a significant adverse effect on habitat effectiveness.

The environmental character of Boulder County is due in large measure to the abrupt altitudinal variation within a 20-mile east-west gradient. Dramatic changes to the landform sharply define the native ecosystems and their associated plant and animal species. The County's environmental heritage includes non-renewable resources such as natural areas, historic/archaeological sites and natural landmarks. As irreplaceable resources, they warrant preservation from destruction or harmful alteration.

Following on the idea of a County open space program in the mid-1960's, residents of Boulder County formally adopted the *Boulder County Comprehensive Plan* in 1978. The Plan included goals and policies for preserving open space, protecting environmental resources (including both natural and cultural resources) and developing a county-wide trail system. By the beginning of 1998 the county open space program comprised more than 52,000 acres of preserved land scattered throughout the county, along with 70 miles of trails. The majority of this land is open for public use and most of the properties are well-suited to passive recreation (recreation development is limited to trails, parking areas/trailheads, picnic areas/shelters, and outhouses). Within the study area is the Bald Mountain Scenic Area; a widely popular recreation spot with both SFPD and Boulder County residents.

Residents of Sunshine who currently live in the study area have a keen appreciation for their natural environment. Living in the mountains has contributed to their quality of life. Recreating in the outdoors and the natural beauty of the area are frequently quoted as reasons local residents have chosen to live in this study area.

The goal of the Boulder County Comprehensive Plan is to maintain and monitor the forests on open space in accordance with ways that benefit the ecosystem and the public by:

1. Assessing overall forest conditions through forest inventories and surveys
2. Implementing prescriptions based on the results of these inventories and surveys
3. Taking action to change or increase the individual tree's health and vigor
4. Reducing fire danger
5. Improving or maintaining wildlife habitat
6. Maintaining and preserving the aesthetic and ecological value of the forest

The SFPD CWPP process is in concert with the guiding principles of the Boulder County Comprehensive Plan. Through public involvement, local support and a regional perspective, the fuels reduction elements described in this CWPP can and should enhance and protect the values of the study area.

Section 6: Community Education & Involvement

Central to the success of wildfire risk reduction activities within the district is the role of the homeowner as the first line of defense. Community education efforts focus on:

1. The natural role that fire plays in the ecosystem within and around SFPD
2. The impact of years of fire suppression
3. Current forest conditions and the impact on fire behavior
4. Limitations of fire suppression
5. The importance of home and community defense
6. Steps that can be undertaken to support the reduction of wildfire risk and enhance the health of the surrounding ecosystem

In addition to community education, the CWPP seeks to involve community members in the protection of their personal property through establishing sound defensible space mitigation practices and encouraging the community to be involved in an overall plan. The SFPD CWPP task force has sought to practice this in many ways, beginning with written communications addressed to each resident, and informal neighborhood gatherings held in private homes. **Appendix D** provides a summary of the CWPP task force meeting schedule and a listing of community involvement efforts. Example documents can be viewed in **Appendix E.**

Section 7: Neighborhood Hazard Summary

Even though wildfire naturally balances the ecosystem, it poses a conundrum for the ever-increasing population of Boulder County. Statistics tell us that between 1990 and 2000 the population increased 29% and has escalated steadily by three percent a year since. With more than 50% of the county's residents inhabiting the "Red Zone" or Wildland-Urban Interface (WUI), the threat of wildfire becomes an even greater concern.

Assessing community risks from wildfire constituted the majority of the work in developing this CWPP. The goal of neighborhood hazard assessment is to determine the likelihood of wildfire occurring and the potential magnitude of wildfire damages. The CWPP task force defined the following six neighborhoods with in SFPD to be addressed in the risk assessment:

1. Dry Gulch
2. Bald Mountain
3. Meadows
4. Pilot
5. Town Site
6. Ingram

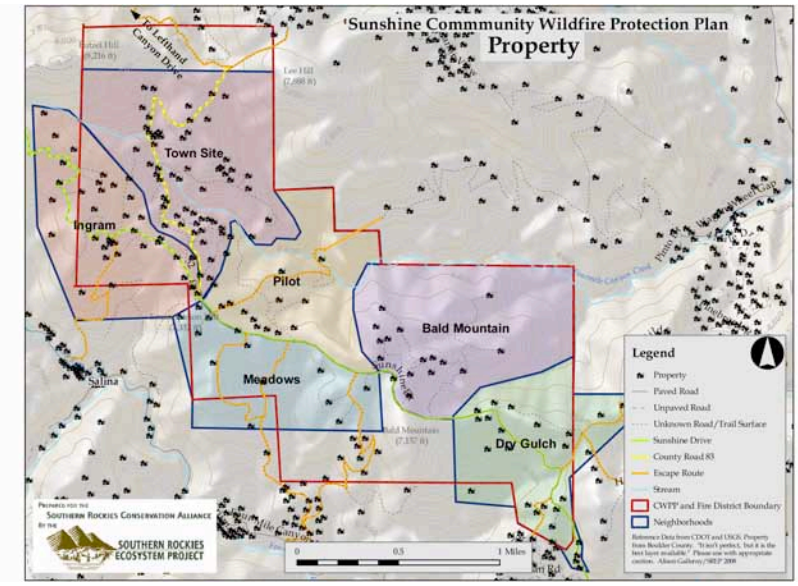
By design, a community hazard assessment derives and rates average characteristics to create an overall community hazard rating. This provides a gauge of risk level and a basis for comparison with other neighborhoods in the SFPD.

Within each of these six neighborhoods home-by-home assessments were conducted, with hazard ratings determined from a model that combines physical infrastructure, such as roads and fire behavior components like fuels and topography, with the field experience and knowledge from forestry and wildland fire experts. As shown below, of these six neighborhoods, four were found to represent a high fire danger and two a moderate fire danger.

Neighborhood Hazard Ratings
Dry Gulch – HIGH
Bald Mountain – HIGH
Meadows – HIGH
Town Site – HIGH
Pilot – MODERATE
Ingram – MODERATE

Figure 5: Neighborhood & Hazard Ratings

Individual Neighborhood Evaluations



DRY GULCH

7.1 Dry Gulch-HIGH Hazard Rating

Dry Gulch is characterized as an intermixed WUI. Structures are built into the forested areas with no clear demarcation between homes and forest. Most of the twenty-three single-family residences are relatively new two-story homes with properties that range generally from one to five acres in size. Sunshine Canyon Drive serves as the primary access to this neighborhood and nearly two-thirds of the structures are located more than 100 feet off this main thoroughfare. Within the Dry Gulch neighborhood, Sunshine Canyon Drive is a two-way asphalt paved road that increases in slope. This section of the Drive is a favorite among amateur and professional cyclists because of its steepness.

Signage along this section of Sunshine Canyon Drive is primarily reflective which facilitates identification in dark and/or smoky environments, though addresses are not always visible from two directions.

Home Construction

Predominant construction materials used in interface communities can have a significant impact on risk assessments and ultimately fire behavior as poorly planned interface construction can easily become a fuel source during a wildland fire. The vast majority of the homes found in this response area have non-flammable roofing with eaves that are enclosed (84.0%); though mostly without fire resistant materials. Nearly half (44.0%) of the structures have wood siding, with unenclosed decks (76.0%) that either have rock or flammable materials under the deck. Both wood siding and unenclosed decks create an external feature that is known to harbor blowing embers allowing them to smolder and ignite structures despite other defensible space efforts.

Defensible Space

Defensible space is a critical component of wildfire hazard risk. Minimum recommended defensible space for flat terrain is a 30 foot Zone around the structure that is free of combustible fuel. Steeper slopes on the downhill side of structures may require a fuel break of up to 125 feet due to fire behavior associated with steeper terrain. In addition to creating defensible space around structures, wildfire risk can be greatly reduced by expanding fuel reduction to the entire property. Primarily this involves removing vegetation and combustible materials around the structure, and limbing and thinning timber.

Light flashy fuels and flammable shrubbery are typically seen immediately surrounding the homes within Dry Gulch. Eighty percent of homeowners have not reduced forest fuel loads within 15 feet of their home to an acceptable level. While crown spacing among the forest surrounding homes (Zones 2 and 3) within Dry Gulch is moderate, ranging between 5 and 15 feet, a reduction of the risk for ignition during a wildfire for homes within this neighborhood would be accomplished by the removal of ladder fuels and increased crown spacing.

The average slope within the Dry Gulch neighborhood ranges between 10% and 40%, with 88% of the homes situated in dangerous topography for firefighting that include chimneys, box canyons and saddles.

Fire Behavior

Fire behavior is controlled by three primary elements: weather, topography and fuel. Front-range winds are a constant threat during the long summer and fall fire seasons. Strong winds can be associated with frontal passages or strong isolated thunderstorm events. Catastrophic wildfires in Boulder County are typically wind-driven, human caused events. Topography and fuel adds a force and momentum that can overcome and outpace even a well planned and executed initial attack.

Like much of Sunshine Fire Protection District, Dry Gulch is located on a ridge, with the slope climbing from southwest to northeast. Vegetation changes character from Colorado Plateau Juniper to dry Montane mixed conifer forest with patches of sandy shrub land. Over the past decade much of conifer forest in Dry Gulch has been weakened by mistletoe infestation which causes trees to grow abnormally. The resulting trees are a larger source of fuel because they develop dense clumps of branches. The Dry Gulch neighborhood is also characterized by rocky soils and outcroppings; features which discourage the spread of ground fire. However, in areas where grasses are thin litter from mixed conifer forests often replaces native grasses as ground fuel. These dead materials do not retain moisture well. Consequently they can easily support ground fires, although such a fire will generally move more slowly than a grass fire.

Even with low to moderate winds, this fuel matrix would support a moderately paced fire in the Dry Gulch neighborhood. A southwest or westerly wind would carry a flame front upslope, cutting off Sunshine Canyon Drive, the only evacuation route.

Additional Hazard Factors

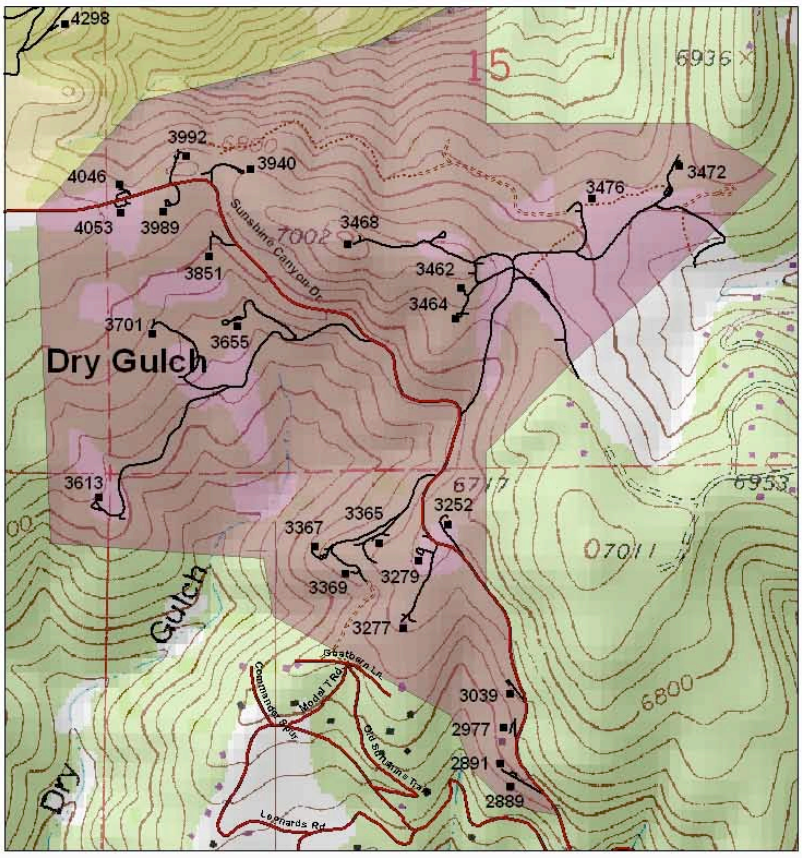
Additional considerations include water supply, utilities, environment and how these potentially affect emergency response and increase risk to the community.

Unlike urban or suburban communities where pressurized or dry hydrants may exist, rural communities often rely on the presence of cisterns or nearby streams or ponds. Recognizing that fire response times are prolonged in absence of a ready supply of water, SFPD undertook a modernization plan that called for the installation of five cisterns at one-mile increments across the FPD. Despite this, over half of the homes in the Dry Gulch community (76.0%) were observed to lack a readily available emergency water supply. Water supply availability has a significant impact on tactical operations including initial attack, structure defense and on-going fire suppression operations.

Topographic and fuel characteristics in the Meadows and Dry Gulch neighborhoods may also pose a serious risk as a southeasterly summer wind (see **Appendix A**) would be predicted to drive a flame front into many of the homes within Bald Mountain and Pilot neighborhoods, and further into Lefthand Canyon. Moreover, the southeastern edge of the Dry Gulch neighborhood borders areas of Boulder County described in an independent CWPP project as being at extreme risk for wildfire danger. This underscores the importance for SFPD to be concerned not only with its own topography, but with the topography that surrounds it, particularly downhill and upwind. Much of the district is located high on slopes near ridges, with long stretches of unbroken fuels below. When these slopes are chimneys, as steep valleys on hillsides are called because of their ability to channel the hot gases from a fire, the potential danger to the properties at the top is multiplied.

Recommendations – DRY GULCH

1. Thinning of trees along Sunshine Canyon Drive, 150 feet on both sides
2. Improve potential secondary egress routes to include the recommended routes of Old Sunshine Trail (See **Sect 8.2.F** p.59), Bristlecone and Wild Horse Circle (See **Sect 8.2.G** p.60)
3. Improve road signage
4. Conduct educational sessions to inform residents how to construct and maintain defensible space.
5. Improve water supply availability
6. Adequate defensible space is recommended for all homes (see **Fig: 4** p. 22)
7. Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers, and kept clean of flammable materials, especially where such openings are located on slopes of heavy fuels
8. Clean leaf and needle litter from roofs and gutters and away from foundations. Clear flammable vegetation away from power lines near homes
9. Discourage the planting of flammable ornamentals, such as conifers, within 30 feet of homes and encourage the use of fire-and-drought-tolerant plants for ornamental plantings



Map 8: Dry Gulch Neighborhood

BALD MOUNTAIN

7.2 Bald Mountain-HIGH Hazard Rating

Bald Mountain is characterized as an intermixed WUI. Structures are built into the forested areas with no clear demarcation between homes and forest. Most of the 17 single family residences are relatively new two-story homes with properties that range generally from one to five acres in size. Sunshine Canyon Drive serves as the primary access to this neighborhood and just over half (59.8%) of the structures are greater than 100 feet beyond this main thoroughfare. Within the Bald Mountain neighborhood, Sunshine Canyon Drive is a two-way asphalt paved road that gradually increases in slope. For 82.4% of the homes within this neighborhood, ingress and egress is conducted by way of a single one-way unpaved road. Signage within the Bald Mountain neighborhood is primarily reflective which facilitates identification in dark and/or smoky environments, and is visible from two directions.

Home Construction

Predominant construction materials used in interface communities can have a significant impact on risk assessments and ultimately fire behavior as poorly planned interface construction can easily become a fuel source during a wildland fire. The vast majority of the homes found in this response area have non-flammable roofing with eaves that are enclosed (84.0%); though mostly without fire resistant materials. Over half (52.9%) of the structures have wood siding with unenclosed decks (76.5%) that either have rock or flammable materials under the deck. Both wood siding and unenclosed decks create an external feature that is known to harbor blowing embers allowing them to smolder and ignite structures despite other defensible space efforts.

Defensible Space

Defensible space is a critical component of wildfire hazard risk. Minimum recommended defensible space for flat terrain is a 30 foot Zone around the structure that is free of combustible fuel. Steeper slopes on the downhill side of structures may require a fuel break of up to 125 feet due to fire behavior associated with steeper terrain. In addition to creating defensible space around structures, wildfire risk can be greatly reduced by expanding fuel reduction to the entire property. Primarily this involves removing vegetation and combustible materials around the structure, and limbing and thinning timber.

Homes within the Bald Mountain neighborhood are set among Beetle Mountain Sagebrush, sandy shrub land, Montane and dry Montane mixed conifer forest. Most homes (82.4%) have some sort of combustible materials against or within 5 feet of the structure that may include shrubs, unenclosed firewood and construction debris. The majority of homes (64.7%), though, maintain improved lots with acceptable forest fuel loads within the first 15 feet of their home. As with most homes in Sunshine Canyon, residents would benefit from increasing crown spacing and reducing ladder fuels within ignition Zones 2 and 3.

The average slope within the Bald Mountain neighborhood ranges between 10% and 40%, with 94.1% of the homes situated over 150 feet away from dangerous topography for firefighting that include chimneys, box canyons and saddles.

Fire Behavior

Fire behavior is controlled by three primary elements: weather, topography, and fuel. Front-range winds are a constant threat during the long summer and fall fire seasons. Strong winds can be associated with frontal passages or strong isolated thunderstorm events. Catastrophic wildfires in Boulder County are typically wind-driven human caused events. Topography and fuel adds a force and momentum that can overcome and outpace even a well planned and executed initial attack.

Unlike the majority of Sunshine Canyon, the Bald Mountain neighborhood is relatively open, with aspects facing northeast that descend toward Fourmile Canyon Creek, east and southeast, opposite the popular Bald Mountain Scenic Area. Vegetation changes character from Ponderosa Pine to dry Montane mixed conifer forest with open spaces of open grasses and sandy shrub land. Over the past decade the conifer forest in the Bald Mountain neighborhood has been weakened by Mistletoe infestation which causes trees to grow abnormally. The resulting trees are a better source of fuel because they develop dense clumps of branches.

Even with low to moderate winds, this fuel matrix would support a moderate to fast moving fire in the Bald Mountain neighborhood. Significant ignition potential exists along heavily used roads with dried grasses along shoulders supporting glow temperature ignitions from cigarettes, sparking brakes, parked cars and car fires. Flash fuels such as grasses and shrubs can support a fast moving fire. A prevailing easterly wind would carry a flame front upslope, cutting off the only evacuation route in a matter of a few minutes. A similar scenario would ensue with summer and autumnal winds from the southwest and west.

Additional Hazard Factors

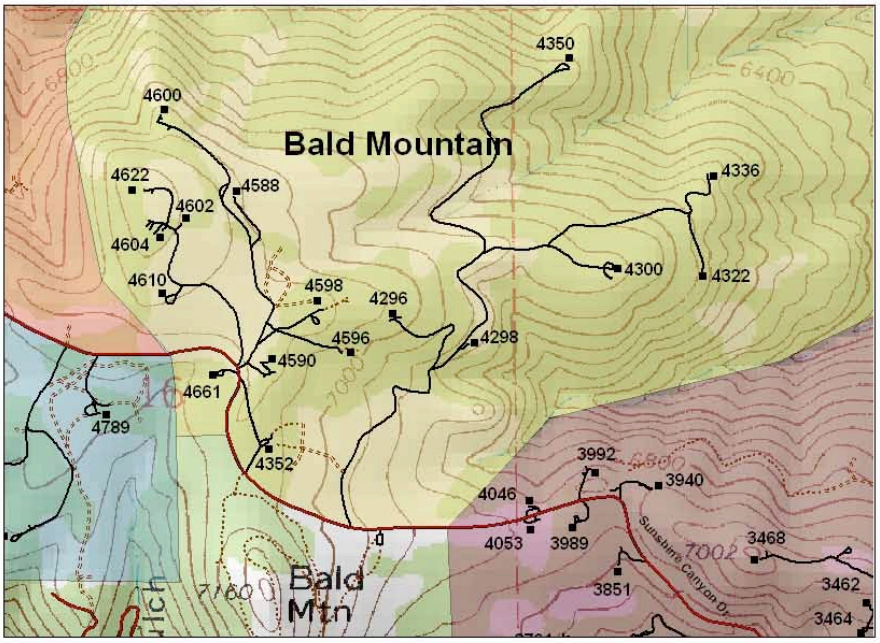
Additional considerations include water supply, utilities, environment and how these potentially affect emergency response and increase risk to the community.

Unlike urban or suburban communities where pressurized or dry hydrants may exist, rural communities often rely on the presence of cisterns or nearby streams and ponds. Recognizing that fire response times are prolonged in absence of a ready supply of water, SFPD undertook a modernization plan that called for the installation of five cisterns at one-mile increments across the FPD. In the case of the Bald Mountain neighborhood, these Sunshine-community cisterns supplement resident- and neighborhood-available cisterns (52.9% and 17.6%, respectively). In the situation of a wildfire, these water sources provide a significant enhancement of tactical operations including initial attack, structure protection and on-going fire suppression operations.

Topographic and fuel characteristics in the Meadows and Dry Gulch neighborhoods pose a serious risk under a variety of scenarios. (See **Appendix A**) For example, both autumn west and dry summer southeast winds are predicted to drive a flame front from these neighborhoods, respectively, into many of the homes in the Bald Mountain neighborhood. Additionally, dry summer east winds would be expected to advance a flame front into the Bald Mountain neighborhood from Lefthand Canyon; where frequent dry lighting strikes occur and many Boulder County residents camp. Together, these underscore the importance for SFPD to be concerned not only with its own topography, but with the topography that surrounds it, particularly downhill and upwind. Much of the district is located high on slopes near ridges, with long stretches of unbroken fuels below. When these slopes are chimneys, as steep valleys on hillsides are called because of their ability to channel the hot gases from a fire, the potential danger to the properties at the top is multiplied.

Recommendations – BALD MOUNTAIN

1. Thinning of trees along Sunshine Canyon Drive, 150 feet on both sides
2. Identification of secondary egress routes and prioritize road clearing projects and the opening up of 200 feet of private land
3. Connect defensible space from the Ingram and Meadows neighborhoods
4. Improve road signage
5. Conduct educational sessions to inform residents how to construct and maintain defensible space
6. Improve water supply availability
7. Adequate defensible space is recommended for all homes (see **Fig: 4** p. 22)
8. Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers, and kept clean of flammable materials, especially where such openings are located on slopes of heavy fuels
9. Clean leaf and needle litter from roofs and gutters and away from foundations, as well as clear flammable vegetation away from power lines near homes
10. Discourage the planting of flammable ornamentals such as conifers within 30 feet of homes, and encourage the use of fire-and-drought-tolerant plants for ornamental plantings



Map 9: Bald Mountain Neighborhood

MEADOWS

7.3 Meadows-HIGH Hazard Rating

The Meadows neighborhood is characterized as an intermixed WUI. Structures are built into the forested areas with no clear demarcation between homes and forest. Most of the 14 single-family residences are relatively new two-story homes with properties that range generally from 1 acre or more in size. Sunshine Canyon Drive serves as the primary access to the homes within this neighborhood. Most (71.4%) of homes have 8 foot-wide, dirt driveways that are greater than 100 feet, have slope of 12% or more and/or have no turnabout. Long sloping roads complicate initial attack and structure defense as they slow response time, and limit the type and number of response vehicles. Moreover, signage for 78.6% of homes is not reflective and is visible from only a single direction, complicating identification in dark and/or smoky environments.

Home Construction

Predominant construction materials used in interface communities can have a significant impact on risk assessments and ultimately fire behavior, as poorly planned interface construction can easily become a fuel source during a wildland fire. The vast majority of the homes found in this response area have non-flammable roofing with eaves that are enclosed (35.7%) without fire resistant materials or were not enclosed and exposed (21.4%). Over half (64.3%) of the structures have wood siding with unenclosed decks (78.5%), with most (71.4%) having flammable materials under the deck. Wood siding, exposed eaves and unenclosed decks create external features that are known to harbor blowing embers allowing them to smolder and ignite structures despite other defensible space efforts.

Defensible Space

Defensible space is a critical component of wildfire hazard risk. Minimum recommended defensible space for flat terrain is a 30-foot Zone around the structure that is free of combustible fuel. Steeper slopes on the downhill side of structures may require a fuel break of up to 125 feet due to fire behavior associated with steeper terrain. In addition to creating defensible space around structures, wildfire risk can be greatly reduced by expanding fuel reduction to the entire property. Primarily, this involves removing vegetation and combustible materials around the structure, and limbing and thinning timber.

Homes within the Meadows neighborhood are set among Montaine-Subalpine grasslands, Beetle Mountain Sagebrush, Ponderosa Pine, South Rocky Mountain Pinyon, and Montane and dry Montane mixed conifer forest. Most homes (85.7%) have some sort of combustible materials against or within 5 feet of the structure that may include shrubs and/or overhanging limbs, unenclosed firewood, and construction debris. 92.9% do not maintain acceptable forest fuel loads within the first 15 feet of their home. As with most homes in Sunshine Canyon, residents in the Meadows neighborhood would benefit from increasing crown spacing and a reduction of the dense ladder fuels within ignition Zones 2 and 3.

The average slope within the Meadows neighborhood ranges between 10% and 40%, with 35.7% of homes on slopes greater than 40% making it dangerous to undertake fire suppression activities. However, 64.3% of the homes are situated over 150 feet away from dangerous topography for firefighting that includes chimneys, box canyons and saddles.

Fire Behavior

Fire behavior is controlled by three primary elements: weather, topography, and fuel. Front-range winds are a constant threat during the long summer and fall fire seasons. Strong winds can be associated with frontal passages or strong isolated thunderstorm events. Catastrophic wildfires in Boulder County are typically wind-driven human caused events. Topography and fuel adds a force and momentum that can overcome and outpace even a well planned and executed initial attack.

Fuel characteristics within the Meadows neighborhood range from Montaine-Subalpine grasslands, Beetle Mountain Sagebrush, Ponderosa Pine, South Rocky Mountain Pinyon, and Montane and dry Montane mixed conifer forest. Over the past decade, the conifer forest in the Meadows neighborhood has been weakened by Mistletoe infestation which causes trees to grow abnormally. The resulting trees are a better source of fuel because they develop dense clumps of branches. The steep slopes, weakened fuels and open grasslands characteristic of the Meadows neighborhood can increase the speed of a flame front, dramatically increasing the risk to up-slope residents and firefighters.

The Meadows neighborhood borders the popular Bald Mountain Scenic Area to the east and is upslope from the towns of Salina and Wall Street to the south and west. The areas around these towns has been identified in an independent CWPP as being at extreme risk for fire danger as conifer stands have grown dense and poorly spaced. Even with low to moderate winds, this fuel matrix would support a moderately fast paced moving fire in the Meadows neighborhood. A southwest, westerly or southeast wind would carry a flame front upslope, cutting off Sunshine Canyon Drive, the evacuation route to Boulder.

Additional Hazard Factors

Additional considerations include water supply, utilities, environment and how these potentially affect emergency response and increase risk to the community.

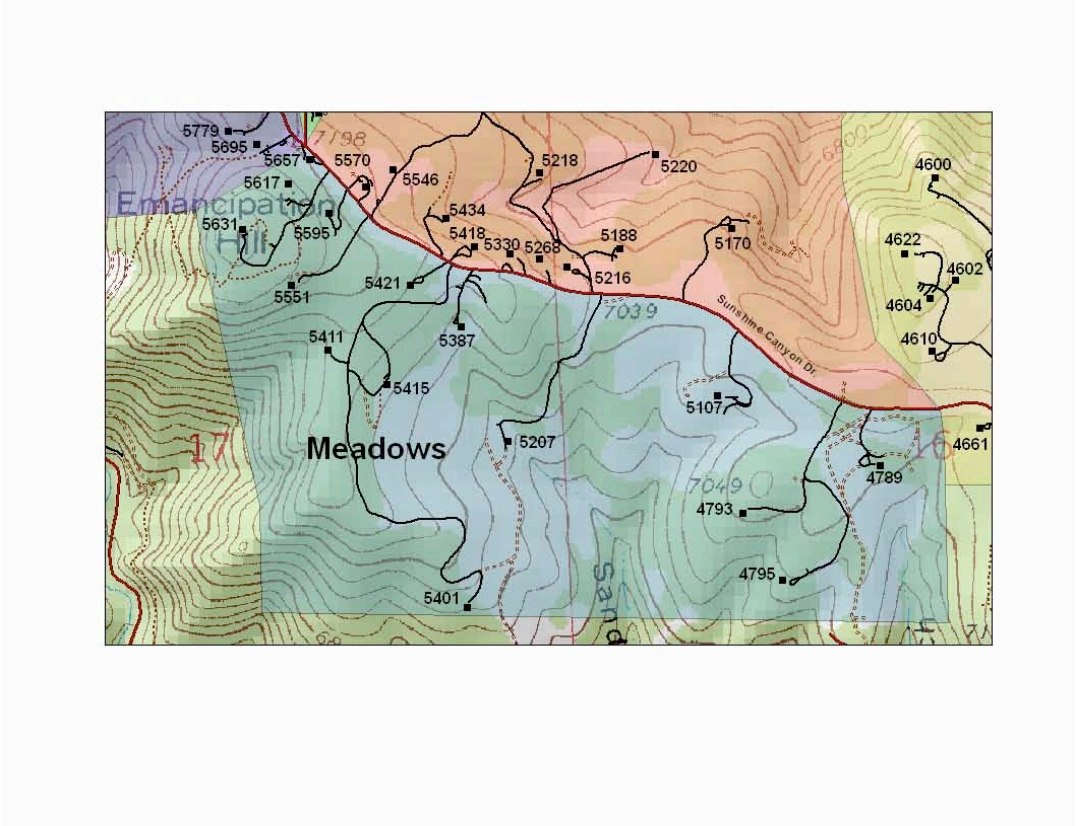
Unlike urban or suburban communities where pressurized or dry hydrants may exist, rural communities often rely on the presence of cisterns or nearby streams or ponds. Recognizing that fire response times are prolonged in absence of a ready supply of water, SFPD undertook a modernization plan that called for the installation of five cisterns at one-mile increments across the FPD. In the case of the Meadows neighborhood, these Sunshine-community cisterns supplement resident- and neighborhood-available cisterns (28.6% and 14.3%, respectively). However, 57.1% of the homes within this neighborhood have no immediately available water source requiring extensive water delivery and supply efforts on the part of SFPD and its automatic and mutual aid partners; efforts which would further congest Sunshine Canyon Drive in the case of an evacuation.

Topographic and fuel characteristics in the Meadows and the surrounding neighborhoods of Dry Gulch and Bald Mountain pose a serious risk under a variety of scenarios (See **Appendix A**). For example, both autumn west and dry summer southeast winds are predicted to drive a flame front from these neighborhoods, respectively, into many of the homes in the Meadows neighborhood. Additionally, dry summer east winds would be expected to advance a flame front into the Meadows neighborhood from Lefthand Canyon; where frequent dry lighting strikes occur and many Boulder County residents camp. Together, these underscore the importance for SFPD to be concerned not only with its own topography, but with the topography that surrounds it, particularly downhill and upwind. Much of the district is high on slopes near ridges, with long stretches of unbroken fuels below. When these slopes are chimneys, as steep valleys on hillsides are called because of their ability to channel the hot gases from a fire, the potential danger to the properties at the top is multiplied. Such formations act as conduits and can funnel fast moving

fires up-slope creating internal momentum and potentially deadly scenarios for residents and firefighters.

Recommendations - MEADOWS

1. Thinning of trees along Sunshine Canyon Drive, 150 feet on both sides
2. Improve potential secondary egress routes to include the recommended routes of Soda Springs (see **Sect 8.2.C** p. 56)
3. Connect defensible space from the Ingram and Bald Mountain neighborhoods
4. Improve road signage
5. Conduct educational sessions to inform residents how to construct and maintain defensible space
6. Improve water supply availability
7. Adequate defensible space is recommended for all homes (see **Fig: 4** p. 22)
8. Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers, and kept clean of flammable materials, especially where such openings are located on slopes of heavy fuels
9. Clean leaf and needle litter from roofs and gutters, and away from foundations, while clearing flammable vegetation away from power lines near homes.
10. Discourage the planting of flammable ornamentals such as conifers within 30 feet of homes and encourage the use of fire-and-drought-tolerant plants for ornamental plantings



Map 10: Meadows Neighborhood

PILOT

7.4 Pilot-MODERATE Hazard Rating

Pilot is characterized as an intermixed WUI. Structures are built into the forested areas with no clear demarcation between homes and forest. Most of the 17 single family residences are relatively new two-story homes with properties that range generally from one to five acres in size. Sunshine Canyon Drive serves as the primary access to this neighborhood, with nearly half (41.7%) of the homes having driveway access of less than 100 feet. Within the Pilot neighborhood, Sunshine Canyon Drive is a two-way asphalt paved road that gradually increases in slope. Ingress and egress from this neighborhood is facilitated by a limited number of roads, one of which allows access to County Road 83 via the Town Site neighborhood. Signage within the Pilot neighborhood is primarily non-reflective and visible from only a single direction. In fire environments, such signage would be expected to delay response times and complicate responses of firefighters from other fire districts.

Home Construction

Predominant construction materials used in interface communities can have a significant impact on risk assessments and ultimately fire behavior, as poorly planned interface construction can easily become a fuel source during a wildland fire. The vast majority of the homes found in this response area have non-flammable roofing (83.3%) with eaves that are enclosed (66.7%); though mostly without fire resistant materials. Nearly half of the homes have non-flammable siding (41.7%) while about 33.3% have wood siding. 75% of homes have an exposed deck, most of which have flammable materials stored underneath. Both wood siding and unenclosed decks create an external feature that is known to harbor blowing embers allowing them to smolder and ignite structures despite other defensible space efforts.

Defensible Space

Defensible space is a critical component of wildfire hazard risk. Minimum recommended defensible space for flat terrain is a 30 foot Zone around the structure that is free of combustible fuel. Steeper slopes on the downhill side of structures may require a fuel break of up to 125 feet due to fire behavior associated with steeper terrain. In addition to creating defensible space around structures, wildfire risk can be greatly reduced by expanding fuel reduction to the entire property. Primarily this involves removing vegetation and combustible materials around the structure, and limbing and thinning timber.

Only 33.3% of homes within the Pilot neighborhood have implemented minimum recommended defensive space Zones. For 66.6% of the homes, limbs, shrubs and other types of combustible materials were observed to be either against or touching the house, greatly increasing the threat of damage or loss during a wildfire. However, 83.4% of the homes benefit from relatively flat or moderate sloping topography and open grassland conditions; 75.0 % of homes are 150 feet or more away from dangerous topography that includes chimneys, box canyons and saddles. As with most homes in Sunshine Canyon, residents would benefit from increasing crown spacing and a reduction of ladder fuels within ignition Zones 2 and 3.

Fire Behavior

Fire behavior is controlled by three primary elements: weather, topography and fuel. Front-range winds are a constant threat during the long summer and fall fire season. Strong winds can be associated with frontal passages or strong isolated thunderstorm events. Catastrophic wildfires in Boulder County are typically wind-driven human caused events. Topography and fuel adds a force and momentum that can overcome and outpace even a well planned and executed initial attack.

Relatively open grasslands punctuated with dense groupings of Ponderosa Pine, dry spruce fir, South Rocky Mountain Pinyon, and dry Montane mixed conifer forest characterize the Pilot neighborhood. In natural forest conditions Ponderosa conifer will grow as isolated individual trees or small stands separated by grassy expanses. The Ponderosa is dependent on naturally occurring fire to limit timber regeneration and maintain these open meadow conditions. In natural conditions their fires were frequent and non-catastrophic. Fuel loads were light, fire

temperatures were cooler, and soils actually benefited from the infusion of released organic material.

The forested areas within and surrounding the Pilot neighborhood are typical of fire dependent ecosystems that have been protected for decades. Isolated stands have grown together to form a contiguous canopy around homes. Isolated stands have regenerated and grown thick and weak. Ground and ladder fuels have accumulated and conifers are weakened by Mistletoe infestation, which causes trees to grow abnormally. Where grasses are thin litter from mixed conifer forests often replaces native grasses as ground fuels in areas. These dead materials do not retain moisture well, but can support ground fires well; although such a fire will generally move more slowly than a grass fire.

Additional Hazard Factors

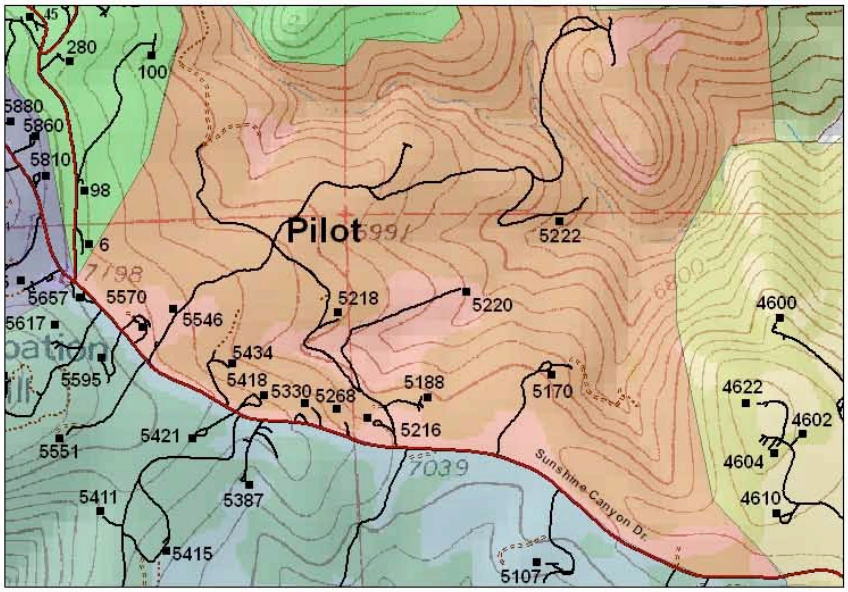
Additional considerations include water supply, utilities, environment and how these potentially affect emergency response and increase risk to the community.

Unlike urban or suburban communities where pressurized or dry hydrants may exist, rural communities often rely on the presence of cisterns or nearby streams or ponds. Recognizing that fire response times are prolonged in absence of a ready supply of water, SFPD undertook a modernization plan that called for the installation of five cisterns at one-mile increments across the FPD. In the case of the Pilot neighborhood, these Sunshine-community cisterns supplement resident- and neighborhood-available cisterns (8.3% and 16.7%, respectively). However, 75.0% of the homes within this neighborhood have no immediately available water source, requiring extensive water delivery and supply efforts on the part of SFPD and its automatic and mutual aid partners; efforts that would further congest Sunshine Canyon Drive in the case of an evacuation.

Topographic and fuel characteristics pose a risk under a variety of theoretical fire scenarios. For example, dry summer southeast winds would most likely drive a flame front from the neighboring Bald Mountain area into this neighborhood, exacerbated by both areas' varied terrain (see **Appendix A, page 76**). Additionally, dry summer east winds would be expected to advance a flame front from fire started along the Ann U White trail on the eastern end of Four Mile Canyon Creek and from lightning strikes that are frequent between this neighborhood and the Boulder Mountain FPD to the north and east (see **Appendix A, page 77**).

Recommendations - PILOT

1. Thinning of trees along Sunshine Canyon Drive, 150 feet on both sides
2. Improve potential secondary egress routes to include the recommended route of Carriage Hills (see **Sect 8.2.E** p.58)
3. Create fuel breaks: Star House to Carriage Hills and Church Camp to Carriage Hills
4. Improve road signage
5. Conduct educational sessions to inform residents how to construct and maintain defensible space.
6. Improve water supply availability
7. Adequate defensible space is recommended for all homes (see **Fig: 4** p. 22)
8. Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers, and kept clean of flammable materials, especially where such openings are located on slopes of heavy fuels.
9. Clean leaf and needle litter from roofs and gutters, and away from foundations, while clearing flammable vegetation away from power lines near homes
10. Discourage the planting of flammable ornamentals such as conifers within 30 feet of homes and encourage the use of fire-and-drought-tolerant plants for ornamental plantings



Map 11: Pilot Neighborhood

TOWN SITE

7.5 Town Site-HIGH Hazard Rating

As the most populated neighborhood in SFPD, Town Site can be characterized as a classic intermixed WUI. As the site for the original town of Sunshine, there are numerous reminders of the old mining town that include a historic 100 year-old school house, a 125 year-old cemetery, homes dating to the early 1900's and original mining equipment. Most of the 58 residences are relatively new with properties that range generally from one to five acres in size. County Road 83 serves as the primary access to this neighborhood and is a winding two-lane dirt road with both flat and steep up-canyon portions that climbs to 7400 feet. Most homes (44.1%) were observed to have driveways less than 300 feet (76.2%) in length, with over half of those being less than 100 feet (50.8%). Signage within the Town Site neighborhood is primarily non-reflective and visible from only a single direction. In fire environments, such signage would be expected to delay response times and complicate responses of firefighters from other fire districts.

Home Construction

Predominant construction materials used in interface communities can have a significant impact on risk assessments and ultimately fire behavior as poorly planned interface construction can easily become a fuel source during a wildland fire. The vast majority of the homes found in this response area have non-flammable roofing (94.9%) with eaves that are enclosed (72.9%); though mostly without fire resistant materials. Keeping with the age of the homes within this neighborhood, nearly two-thirds (61.0%) have wood siding. Unenclosed decks were observed for 47.4% of homes, with 20.3% having flammable materials stored underneath. Both wood siding and unenclosed decks create an external feature that is known to harbor blowing embers allowing them to smolder and ignite structures despite other defensible space efforts.

Defensible Space

Defensible space is a critical component of wildfire hazard risk. Minimum recommended defensible space for flat terrain is a 30 foot Zone around the structure that is free of combustible fuel. Steeper slopes on the downhill side of structures may require a fuel break of up to 125 feet due to fire behavior associated with steeper terrain. In addition to creating defensible space around structures, wildfire risk can be greatly reduced by expanding fuel reduction to the entire property. Primarily this involves removing vegetation and combustible materials around the structure, and limbing and thinning timber.

Only 35.6% of homes within the Town Site neighborhood have implemented minimum recommended defensive space Zones; 74.6% of homes were observed to have some type of combustible material within 5 feet of the home and 59.3% had limbs within 5 feet of their roof line. As with most homes in Sunshine Canyon, residents would benefit from increasing crown spacing and a reduction of ladder fuels within ignition Zones 2 and 3.

Fire Behavior

Fire behavior is controlled by three primary elements: weather, topography and fuel. Front-range winds are a constant threat during the long summer and fall fire season. Strong winds can be associated with frontal passages or strong isolated thunderstorm events. Catastrophic wildfires in Boulder County are typically wind-driven, human caused events. Topography and fuel adds a force and momentum component that can overcome and outpace even a well planned and executed initial attack.

To the south edge of the Town Site neighborhood, along County Road 83, Ponderosa Pine, Montane, Sub-alpine grassland, greasewood flat, and South Rocky Mountain Pinyon are characteristic. Forest density increases in the northern portions of the neighborhood where dry Montane mixed conifer stands predominate. Much of the original, old-growth forest was harvested during the mining years in Sunshine Canyon. Over the past decade, much of conifer forest in Town Site has been weakened by Mistletoe infestation which causes trees to grow abnormally. The resulting trees are a better source of fuel because they develop dense clumps of branches. The Town Site neighborhood is also characterized by rocky soils and outcroppings; features which discourage the spread of a ground fire.

The forested areas within and surrounding the Town Site neighborhood are typical of fire dependent ecosystems that have been protected for decades. Isolated stands have grown together to form a contiguous canopy around homes. Isolated stands have regenerated and grown thick and weak. Ground and ladder fuels have accumulated and conifers are weakened by mistletoe infestation which causes trees to grow abnormally. Where grasses are thin, litter from mixed conifer forests replaces native grasses as ground fuels in areas. These dead materials do not retain moisture well, but can support ground fires well; although such a fire will generally move more slowly than grass fire.

The combination of topography and vegetation in Town Site would be expected to support ground fires with the possibility of active crown fires in the dense conifer stands. Areas to west of Town Site are also at substantial risk for active crown fires and have been rated an extreme fire danger by an independent CWPP. Dry summer southeast winds would be expected to drive flame fronts from fires originating in areas of extreme fire danger to the southeast of SFPD and would also be expected to pose danger to residents and firefighters within the Town Site neighborhood (See **Appendix A**).

Additional Hazard Factors

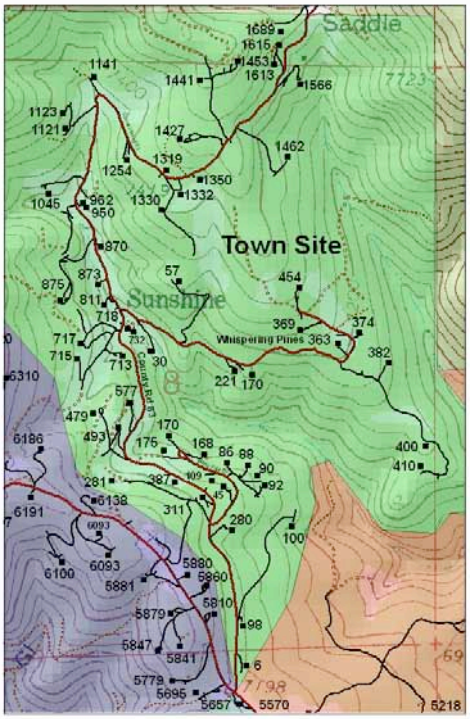
Additional considerations include water supply, utilities, environment and how these potentially affect emergency response and increase risk to the community.

Unlike urban or suburban communities where pressurized or dry hydrants may exist, rural communities often rely on the presence of cisterns or nearby streams or ponds. Recognizing that fire response times are prolonged in absence of a ready supply of water, SFPD undertook a modernization plan that called for the installation of five cisterns at one-mile increments across the FPD. The Town Site has the largest cistern holding 100,000 gallons of water and is located underneath Station #2. In the case of the Town Site neighborhood, community cisterns provide 94.9% of available water, requiring extensive coordination in water delivery and supply efforts on the part of SFPD and its automatic and mutual aid partners. These efforts would further congest Sunshine Canyon Drive and County Road 83 in the case of an evacuation.

Location of power lines varies within the area, with most power and phone lines placed overhead. Propane is the primary source of fuel for heating and cooking in mountain communities. Most propane tanks within Town Site are exposed with some vegetation immediately around the tank. Overhead power lines and exposed propane tanks are other hazard factors that pose a credible ignition risk within the Town Site neighborhood.

Recommendations – TOWN SITE

1. Thin trees along Sunshine Canyon Drive, 150 feet on both sides
2. Thin trees along County Road 83, Misty Vale Court, and Whispering Pines
3. Improve potential secondary egress routes to include the recommended routes of Glendale Gulch (see **Sect 8.2.A** p.54) and Whispering Pines (see **Sect 8.2.D** p.57)
4. Create fuel breaks: Sunshine Saddle to Snowbound over Butzel Hill
5. Improve road signage
6. Conduct educational sessions to inform residents how to construct and maintain defensible space
7. Improve water supply availability
8. Adequate defensible space is recommended for all homes (see **Fig: 4** p. 22)
9. Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers, and kept clean of flammable materials, especially where such openings are located on slopes of heavy fuels.
10. Clean leaf and needle litter from roofs and gutters, and away from foundations while clearing flammable vegetation away from power lines near homes
11. Discourage the planting of flammable ornamentals such as conifers within 30 feet of homes and encourage the use of fire-and-drought-tolerant plants for ornamental plantings



Map 12: Town Site Neighborhood

INGRAM

7.6 Ingram-MODERATE Hazard Rating

Ingram is characterized as an intermixed WUI. Structures are built into the forested areas with no clear demarcation between homes and forest. Most of the 37 single family residences are relatively new two-story homes with properties that range generally from one to five acres in size. Sunshine Canyon Drive serves as the primary access to this neighborhood and many of the structures are within 100 feet of this main thoroughfare. Within the Ingram neighborhood, Sunshine Canyon Drive is a two-way winding dirt road that gradually increases in slope. Though maintained periodically by Boulder County, road dust generated by heavy traffic on this unpaved section has been attributed to the generally poor health of the forest bordering the road. Signage along Sunshine Canyon Drive is primarily reflective, which facilitates identification in dark and/or smoky environments, though addresses are not always visible from two directions.

Home Construction

Predominant construction materials used in interface communities can have a significant impact on risk assessments and ultimately fire behavior as poorly planned interface construction can easily become a fuel source during a wildland fire. The vast majority of the homes found in this response area have non-flammable roofing with eaves that are enclosed (80.6%); though not always with fire resistant materials. Just over half (51.0%) of the structures have wood siding, with unenclosed decks (63.9%) that either have rock or flammable materials under the deck. Both wood siding and unenclosed decks create an external feature that is known to harbor blowing embers allowing them to smolder and ignite structures despite other defensible space efforts.

Defensible Space

Defensible space is a critical component of wildfire hazard risk. Minimum recommended defensible space for flat terrain is a 30 foot Zone around the structure that is free of combustible fuel. Steeper slopes on the downhill side of structures may require a fuel break of up to 100 feet due to fire behavior associated with steeper terrain. In addition to creating defensible space around structures, wildfire risk can be greatly reduced by expanding fuel reduction to the entire property. Primarily this involves removing vegetation and combustible materials around the structure, and limbing and thinning timber.

Light and flashy fuels and flammable shrubbery are typically seen immediately surrounding the homes within Ingram. However, 64.8% of homeowners maintain improved lots with acceptable forest fuel loads within the first 15 feet of their home. This contrasts observations that most homes would benefit from the removal of ladder fuels and increased spacing as vegetation within defensible space Zones 2 and 3 were predominantly non-conforming and moderate-to-heavy in overall density.

The average slope within the Ingram neighborhood ranges between 10% and 40%, with 19% of the homes situated in dangerous topography for firefighting that includes chimneys, box canyons and saddles; 25% of the homes situated in this response area are situated on slopes too steep to fight wildfire effectively.

Fire Behavior

Fire behavior is controlled by three primary elements: weather, topography, and fuel. Front-range winds are a constant threat during the long summer and fall fire seasons. Strong winds can be associated with frontal passages or strong isolated thunderstorm events. Catastrophic wildfires in Boulder County are typically wind-driven, human caused events. Topography and fuel adds a force and momentum that can overcome and outpace even a well planned and executed initial attack.

Much of Sunshine Fire Protection District and Ingram is located on a ridge with the slope climbing from southwest to northeast. Vegetation changes character from Colorado plateau pinyon-juniper to dry Montane mixed conifer forest with patches of sandy shrub land. Over the past decade much of conifer forest in Ingram has been weakened by mistletoe infestation which causes trees to grow abnormally. The resulting trees are a larger source of fuel because they develop dense clumps of branches. The Ingram neighborhood is also characterized by rocky soils and outcroppings; features which discourage the spread of a ground fire. Where grasses are thin litter from mixed conifer forests often replaces native grasses as ground fuels in areas. These dead materials do not retain moisture well, but can support ground fires well; although such a fire will generally move more slowly than a grass fire.

Even with low to moderate winds, this fuel matrix would support a moderately moving fire in the Ingram neighborhood. A southwest or westerly wind would carry a flame front upslope, cutting off the evacuation routes of Sunshine Canyon Drive and an unpaved jeep road leading to Salina.

Additional Hazard Factors

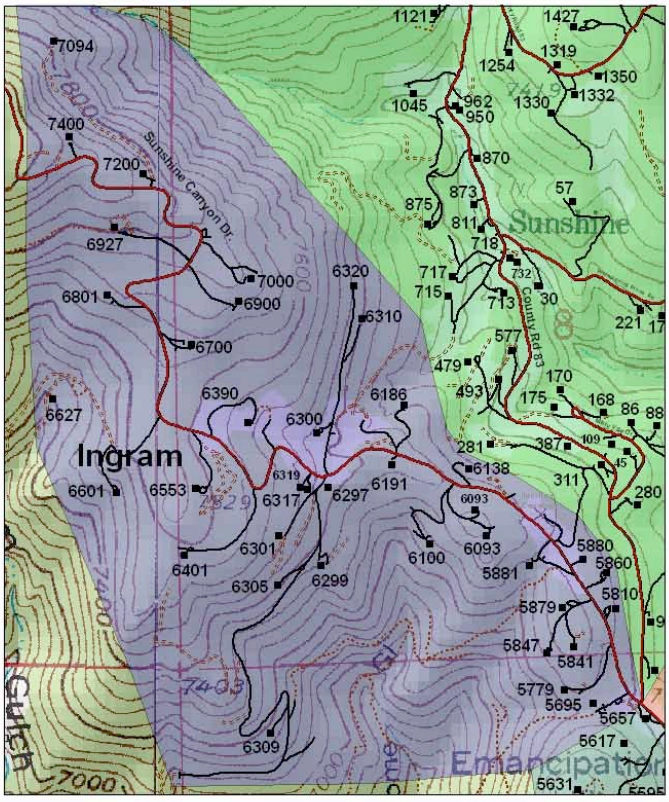
Additional considerations include water supply, utilities, environment and how these potentially affect emergency response and increase risk to the community.

Unlike urban or suburban communities where pressurized or dry hydrants may exist, rural communities often rely on the presence of cisterns or nearby streams or ponds. Recognizing that fire response times are prolonged in absence of a ready supply of water, SFPD undertook a modernization plan that called for the installation of five cisterns at one-mile increments across the FPD. Despite this, over half of the homes in the Ingram community (52.8%) were observed to lack a readily available emergency water supply. Water supply availability has a significant impact on tactical operations, including initial attack, structure defense and on-going fire suppression operations.

Topographic and fuel characteristics in the Meadows and Dry Gulch neighborhoods may also pose a serious risk as a southeasterly summer wind would be predicted to drive a flame front into many of the homes within the Ingram neighborhood (see **Appendix A**). Moreover, the southwestern edge of the Ingram neighborhood borders areas of Boulder County described in two independent CWPP projects as being at extreme risk for wildfire danger. This underscores the importance for SFPD to be concerned not only with its own topography, but with the topography that surrounds it, particularly downhill and upwind. Much of the district is high on slopes near ridges with long stretches of unbroken fuels below. When these slopes are chimneys, as steep valleys on hillsides are called because of their ability to channel the hot gases from a fire, the potential danger to the properties at the top is multiplied.

Recommendations - Ingram

1. Thin trees along Sunshine Canyon Drive, 150 feet on both sides
2. Improve potential secondary egress to include the recommended route of Salina (see **Sect 8.2.B** p.55)
3. Create fuel breaks: connect projects with the Meadows and Bald Mountain neighborhoods
4. Improve road signage
5. Conduct educational sessions to inform residents how to construct and maintain defensible space
6. Improve water supply availability
7. Adequate defensible space is recommended for all homes (see **Fig: 4** p. 22)
8. Open areas below decks and projections should be enclosed or screened to prevent the ingress of embers, and kept clean of flammable materials, especially where such openings are located on slopes of heavy fuels
9. Clean leaf and needle litter from roofs and gutters and away from foundations while clearing flammable vegetation away from power lines near homes
10. Discourage the planting of flammable ornamentals such as conifers within 30 feet of homes and encourage the use of fire-and-drought-tolerant plants for ornamental plantings



Map 13: Ingram neighborhood

Section 8: Recommendations - Solutions & Mitigations

Following careful analysis of the data collected during the home assessments, members of the SFPD CWPP committee met with representatives from the Colorado State Forest Service, Boulder County Land Use Department, and the Southern Rockies Conservation Alliance to develop and prioritize a set of recommendations consistent with the stated goals of the CWPP program. The recommendations reflect a particular function, like enhancing egress, developing an effective public outreach program or fuels reductions in particular areas of SFPD. These solutions are designed to serve as proposed outlines for projects. In conjunction with community members, the overall priority and scope of these recommendations will dictate the final project(s) implemented.

A number of recommendations have been identified for SFPD and include:

8.1 Fuel Breaks along District Roads

Study of the fire district revealed that several identified dangers could be significantly mitigated by fortifying the district's roads to provide:

1. More secure firebreaks
2. Safer ingress and egress for both emergency vehicles and residents
3. Promotion of a healthier, safer forest
4. Development of a strong visible public example of how proper fire mitigation looks and feels
5. Incouragement and education to individual property owners in an organized fire protection effort.

Since the SFPD is located primarily along a ridge top stretching from Sunshine Canyon, west of the City of Boulder, to the saddle between Butzel Hill and Bighorn Mountain, establishing the roads as significant fire breaks would also provide protection to the surrounding fire districts, as well as divide the SFPD into areas that may be better accessed and protected. An added benefit would be that each of the six district neighborhoods would benefit from this single district-wide effort.

The roads to be included in this Fire Break project should include **Sunshine Canyon Drive**, which is the major route through the district that connects the City of Boulder to the Town of Gold Hill, **County Road 83**, between Sunshine Canyon Drive and the Sunshine Saddle (between Butzel Hill and Lee Hill), **Misty Vale Court**, a residential cul-de-sac branching off County Road 83, and **Whispering Pines Road**, a dead end residential private drive departing County Road 83.

There are other roads in the district that, at the time of this report, are unimproved and un-maintained. These include **County Road 89N**, from Sunshine Canyon Drive to the Town of Salina (in the Four Mile Fire District), **County Road 83J**, which is a continuation of County Road 83 north of the Sunshine Saddle terminating in the community of Rowena at Lefthand Canyon Drive, and **Glendale Gulch**, which branches off of County Road 83J and proceeds north to Lefthand Canyon Drive in the community of Glendale. These three roads are not included in this firebreak recommendation but are included elsewhere in this report for fire mitigation and emergency egress.

In order to provide the necessary firebreak and protected right-of-way, the following criteria are necessary for mitigation along these routes:

1. A minimum of 150 feet fire mitigation space on either side of each road
2. 15 feet spacing between tree crowns, increasing to 30 or more feet on steeper slopes
3. Removal of dead trees and shrubs
4. Removal of ladder fuels, including smaller trees/shrubs growing under taller trees, and pruning/limbing trees
5. Set-back of trees from the road at a distance to provide for healthy growth of trees as well as protection from traffic and snow plowing
6. Follow criteria as established by the Colorado State Forest Service (CSFS) and Boulder County
7. Generally conform to The Healthy Forests Initiative and Healthy Forest Restoration Act of 2003
8. Recognition that this project will require cooperation among Boulder County, the U.S. Bureau of Land Management (BLM), private land owners, the SFPD, adjacent fire districts, the CSFS and others.

8.2 Community Egress Routes

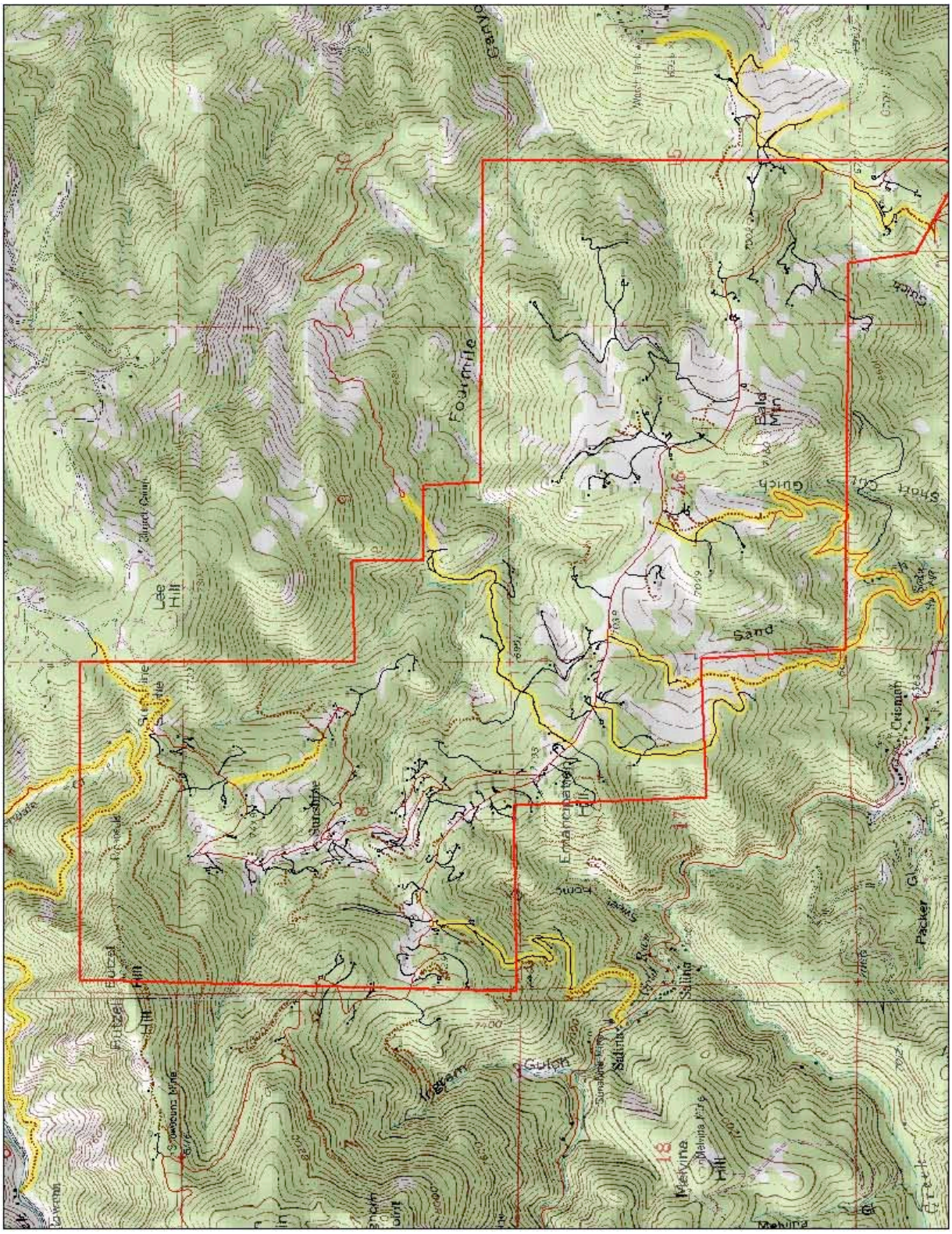
One of the biggest concerns to SFPD residents is the ability to leave an endangered neighborhood in the time of crisis. Because of the mountainous nature of this area many of the residents in the SFPD have only one option to depart their homes, making possible routes to safety limited. This not only complicates the egress of residents, but also greatly reduces the ability of emergency services to arrive on-scene without being hampered by congestion. For these reasons it is a priority to provide as many emergency egress routes as possible.

Several old roadbeds, right-of-ways, small fields or pathways connecting with out-of-district streets or roads should be improved or established to provide emergency passage, providing alternate routes to Boulder and beyond.

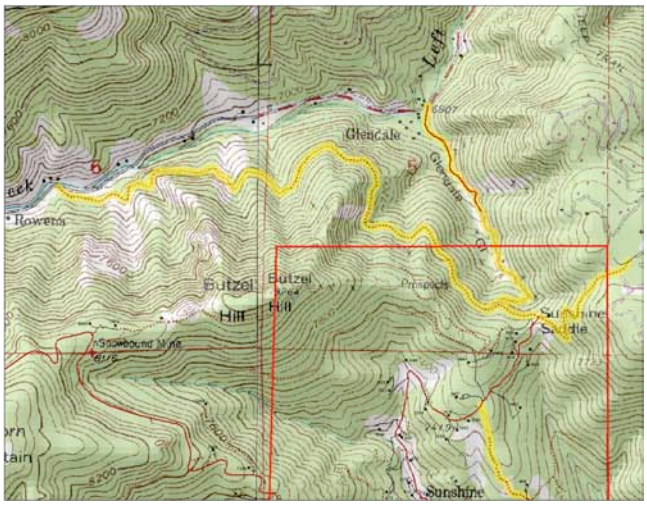
Standard escape routes should be established for differing types and locations of incidents. These plans should be communicated to residents and property owners, and utilize written descriptions, maps and road signage. These escape routes should take into account the routes most likely to be used by incoming emergency personnel.

Most of these proposed routes will be susceptible to recreational use and may need to be restricted except for emergencies. A standard practice of gating and locking should be established for use at all gates in the fire district. Possible standards could include fire department locks with common keys or combinations, or "Knox Box" arrangements.

The following routes are designated as areas to be developed and are listed in the order of their priority as based on their level of importance to the community:



Map 14: Proposed Egress Routes: SFPD



Map 15: Glendale Gulch Egress

A. Glendale Gulch Egress

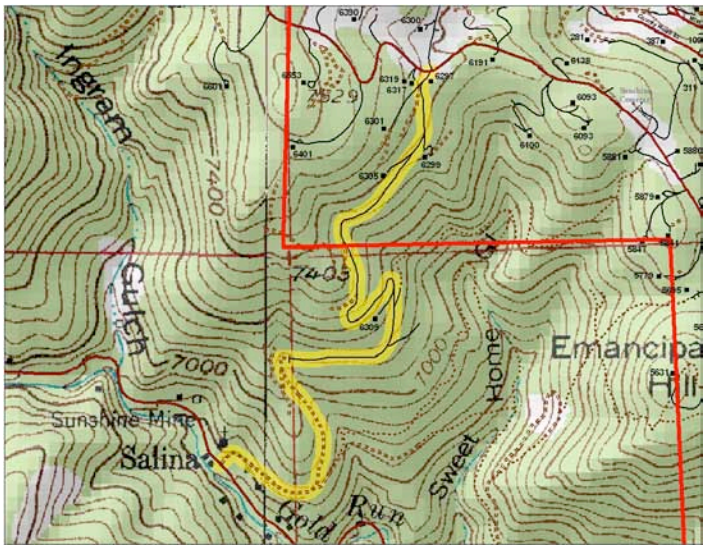
On the north edge of the SFPD, where County Road 83 terminates, County Road 83J proceeds from the Sunshine Saddle (between Butzel Hill and Lee Hill) 928 feet to where it intersects with old Glendale Gulch Road. This was a mining and forestry road at the beginning of the 20th century and while 83J sustains some recreational foot and bicycle traffic to the community of Rowena, Glendale Gulch Road in this area is unused. Glendale proceeds easterly for 753 feet to where the road turns north-northwest and then follows the drainage approximately .7 miles to the intersection with Lefthand Canyon Drive. The northern half of Glendale Gulch Road is an improved dirt road that allows regular vehicle traffic to several homes in the gulch. However, the southern half of the road is blocked by a large tree trunk placed to prevent vehicle traffic.

The entire passage is currently wide enough for "two-track" off-road use but would require cutting of trees, light improvement of the road base and perhaps reconstruction of the intersection at 83J and Glendale to provide a proper turning radius.

There are several advantages to this route for emergency use. The roadway is downhill and will need minimal improvement in order to facilitate use, reducing development costs. All of the property that would require rehabilitation is owned by Boulder County who may be willing to cooperate with this development. This route leaves from the most inaccessible part of the district, the "top" of Sunshine, which services the largest number of homes in the district and takes a very direct path to a paved and well-used roadway leading to areas of the county that would not conflict with emergency traffic servicing SFPD. This route would also open access to the forest and make mutual aid between the Lefthand FPD and Sunshine FPD possible for the first time.

Negatives to this route include the probability that at least part of Glendale Gulch Road is "private" and property owners may not wish to cooperate. Boulder County may desire the area to remain purely recreational. And the possibility of increased foot and bicycle traffic on the improved roadway is strongly opposed by the community. Other negatives are that this passage is steep and is on the north side of the mountain. It receives little sun and retains snow late into the season. Surveys of the area, however, indicate that snow would not be an issue during most of the fire season.

Completion of this egress route would require the cooperation of private property owners and Boulder County, as well as significant restriction to the increased recreational use of the improved roadway.



Map 16: Salina Egress

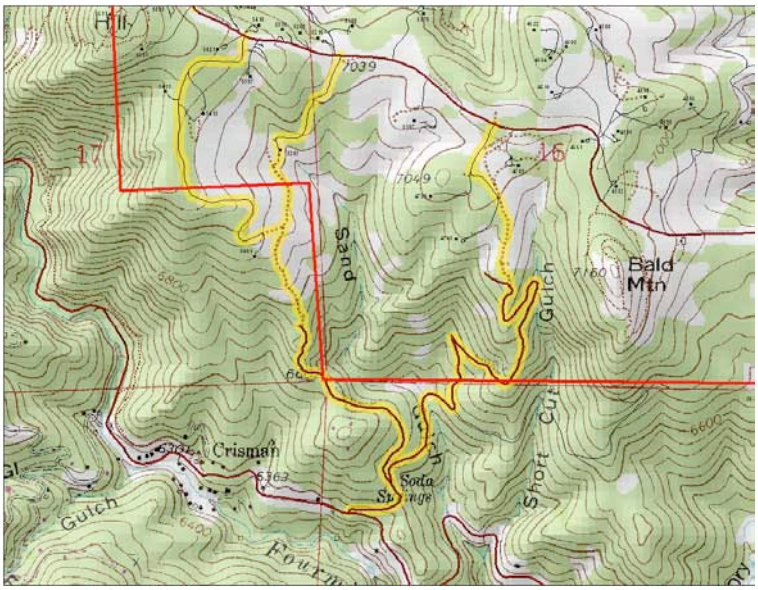
B. Salina Egress

The driveway at 6297 Sunshine Canyon Dr. is actually the old roadbed of Boulder County Road 89N down to the community of Salina on Gold Run Road (Four Mile Fire District). Though this is a designated county road, it has not been maintained and was used exclusively for recreation until a house was built halfway to Salina. At that time the dirt road was improved to roughly county standards for a distance of .75 miles. South from there, .38 miles, the roadway is rough and steep, not maintained, but possibly passable with an off-road vehicle. Lower portions of this route were part of the original 1800's Gold Run Road. This route intersects with the newer paved Gold Run Road at the Little Church of the Pines parking lot.

As an escape route, the Salina road would furnish a direct southern path out of Sunshine for residents west of County Road 83 along Sunshine Canyon Drive, including traffic from the Town of Gold Hill. This route would provide a service road for Four Mile Fire to reach areas in their district heretofore not accessible. It would also permit fire vehicles access and escape without having to turn around and climb back up hill. This area is considered very dangerous to fire personnel because it is only accessed by a one-way in/one-way out narrow road.

Of the portion of County Road 89N that would need to be reconstructed, the U.S. Government (BLM) owns approximately 20%. The remainder is privately held. The future likelihood that more homes will be built there leads to the possibility that private landowners may open this road, making emergency use extremely inexpensive. Regardless of who arranges or pays for reconstruction, this route is necessary for the safety of both the Sunshine and Four Mile Fire Districts. With this direct access to Boulder Canyon, Boulder city and Nederland, as well as Gold Hill and Sugarloaf, no other egress would supply the flexibility and convenience of this Salina route.

An area of concern is the last (southern) 450 feet of roadbed. This portion is constructed over hand-stacked stone and may require extensive work to assure integrity. Study of the area should be considered. Other improvements would most likely be minor, probably restricted to clearing and smoothing of the roadbed, and the addition of road base material. The typical concern about the increase in bicycle and foot traffic would have to be remediated.



Map 17: Soda Springs Egress

C. Soda Springs Egress

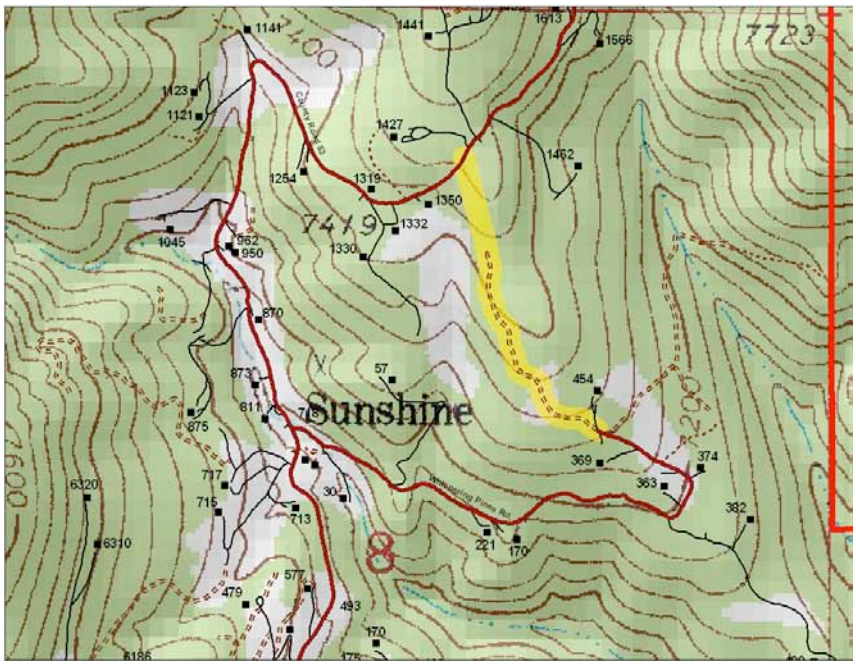
In the center of the Sunshine Fire District there are several possible routes for future egress. At 5207 and 5411 Sunshine Canyon Drive, two different routes should be considered to connect to the south with Camino Bosque Road for escape to Four Mile Canyon Road through Soda Springs. Both routes would utilize present dirt driveways, with one being longer and more circuitous, requiring less road reconstruction (5411), and the other being more direct but possibly needing more work to complete (5207). The 5207 route passes directly next to the residence there and may not be acceptable to the property owner. Both routes would share a southern portion that follows an old roadbed that would require reconstruction to complete.

A third, Soda Springs option, to intersect with Four Mile Canyon Road is the driveway servicing 4593 and 4595 Sunshine Canyon Drive. This driveway could easily be connected to Arroyo Chico Road by carving a dirt roadbed through a 1048 foot long field. These properties are privately owned and cooperation with landowners would need to be considered. Once arriving at Arroyo Chico Road, the route to Sodas Springs is longer and more winding than the other possibilities.

Similar to the Salina egress route, Soda Springs would provide flexible access to Boulder Canyon, Boulder city, Nederland, Sugarloaf and Gold Hill. The length of necessary roadway for each of the three possible routes is as follows:

4793/4795 Sunshine Canyon Drive/Arroyo Chico Road = 8885 feet/1.7 mile
5207 Sunshine Canyon Drive/Camino Bosque Road = 7348 feet/1.4 miles
5411 Sunshine Canyon Drive/Camino Bosque Road = 9038 feet/1.7 miles

As with previous egress suggestions, this route would provide access for both Sunshine and Four Mile Fire departments to areas not accessible otherwise. Restriction of recreational traffic would be a major concern to residents.



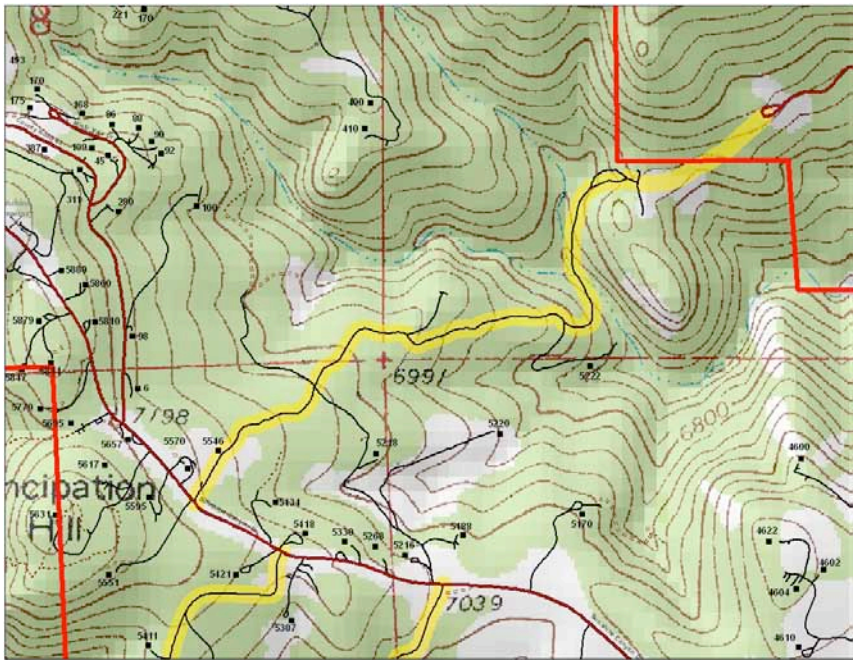
Map 18: Whispering Pines Egress

D. Whispering Pines Egress

Whispering Pines, a homeowner-maintained private road off County Road 83, presents a difficult challenge to fire fighters. The terrain is extremely steep, the road is very narrow and there is no room for fire apparatus to park or turn around on much of the road. While a reasonable water supply exists, the road is a dead end, allowing only one fire truck at a time, which makes providing water in an emergency extremely difficult.

Much of Whispering Pines was originally constructed on old mining roads and the remnants of such a road continues from the end of Whispering Pines through private property and stops just shy of County Road 83 at a point uphill and to the north of where Whispering Pines began. If this old forest road could be made passable again a traffic circle would exist to allow emergency traffic to operate two water supplies while traveling one-way around the CR83 – Whispering Pines – CR83 route. This route would effectively serve as an escape route to both residents and emergency personnel, providing emergency tactics not possible otherwise.

The trail needing reconstruction is 1194 feet long, and a section of new road 534 feet long would have to be constructed to connect Whispering Pines back to County Road 83. This new section would be through light forest that is relatively flat and probably had a road many years ago. A recent land purchase has reduced the private ownership of this area to only three property owners. Competition of this "loop" would permit meeting Insurance Services Organization (ISO) standards in the foreseeable future.



Map 19: Carriage Hills Egress

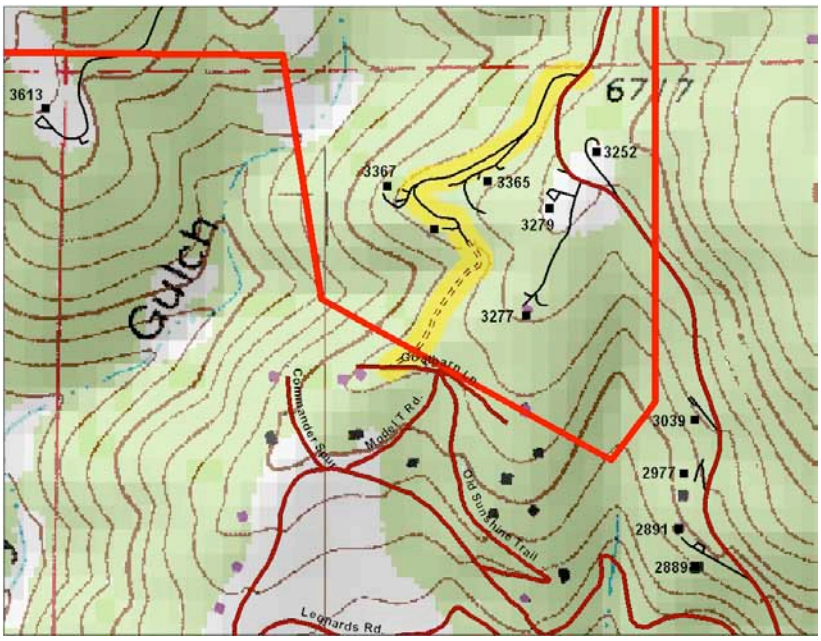
E. Carriage Hills Egress

Another egress route in the center of the SFPD follows the driveway at 5546 Sunshine Canyon Drive, passing north through the Pilot Mine area, over Fourmile Canyon Creek, through a 1200 foot length field and connecting to West Coach Road in the Carriage Hills subdivision. This route would supply passage through Carriage Hills to Lee Hill Road and areas north of the City of Boulder. While there is another connection to this route (via 5218 Sunshine Canyon Dr.), this route is more direct and would allow a larger variety of vehicles to pass.

The current driveway/road is very serviceable, but the crossing at Fourmile Canyon Creek requires reconstruction. As well, repair of the road north of the creek and to the north boundary of the fire district is necessary. At this north boundary the roadway ends and any newly constructed passage would have to be manufactured following a footpath through the above-mentioned field. Once West Coach Road is reached, the route to Lee Hill Road is winding and circuitous.

West Coach Road is a single lane paved street maintained by a private homeowner's association. Travel of heavy fire vehicles may present a road maintenance difficulty for pavement is of light construction. All of this proposed egress passes through private lands.

Construction of this passage would facilitate access by both the SFPD and Boulder Mountain Fire District. This area is prone to lightning activity and usually has more lightning strikes than any other area of the SFPD. Access has been difficult and this route would provide relief. With passage through several neighborhoods, increased recreational use and emergency traffic may be an objected to by residents.



Map 20: Old Sunshine Trail Egress

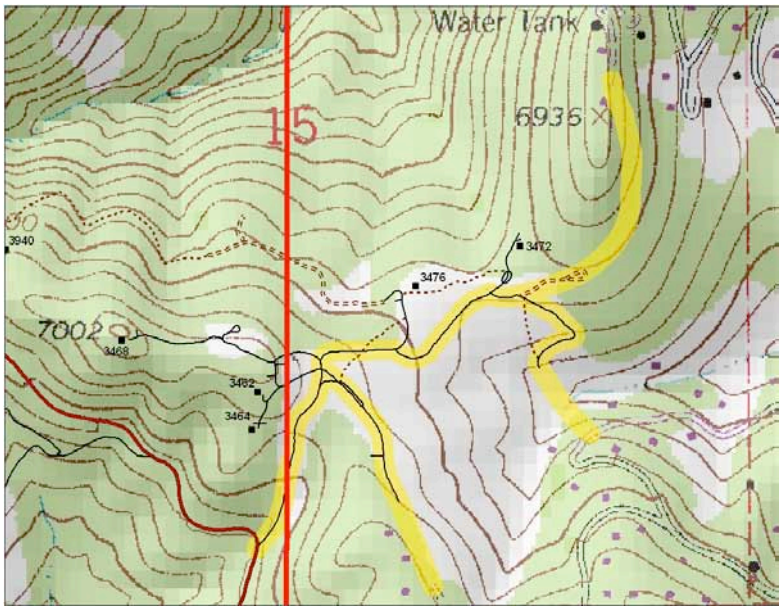
F. Old Sunshine Trail Egress

At the southeastern boundary of the SFPD (at approx. 3000 Sunshine Canyon Drive) the original 1800's Sunshine roadway proceeded up Poorman Road and followed the paths of what are now Old Sunshine Trail, Model T Road and Old Goatbarn Lane. Due to construction of new homes and the fact that the county has never maintained the road, portions of this route are now discontinuous. Further building in the area is making the need for increased fire access very important to the safety of the Poorman and Lower Sunshine communities.

Reconstruction of the Old Sunshine Trail, reconnecting portions of Model T Road, Goatbarn Lane and the current Old Sunshine Trail to the driveway at 3365 Sunshine Canyon Drive would facilitate alternate paths for residents in the area as well as provide a one-way circular route for fire apparatus to access a very difficult location.

Foot and bicycle traffic use this route to some degree, however, a locked gate installed by residents limits traffic. If this gate, or another one like it, remained in place, residents will support completion of this egress. Because two fire districts, SFPD and Boulder Rural FPD, share this area, common interests are served and a pooling of resources may be possible. Since home construction is commencing in the area at the time of this report and since conversations have already begun with property owners regarding this project, it is suggested that this project be given top priority in its competition. While other routes may have a higher level of importance to the entire SFPD, the fact that this project is well into its planning stage with Boulder County, Boulder Rural FPD and the community, suggests that this egress be completed as soon as possible.

The portion of Old Sunshine Trail that needs to be reconstructed is 777 feet long. Elimination of a few trees, grading of the roadbed, relocation of the privacy gate and excavation of the old roadway where it meets the new will be necessary.



Map 21: Bristlecone Trail Egress

G. Bristlecone Egress

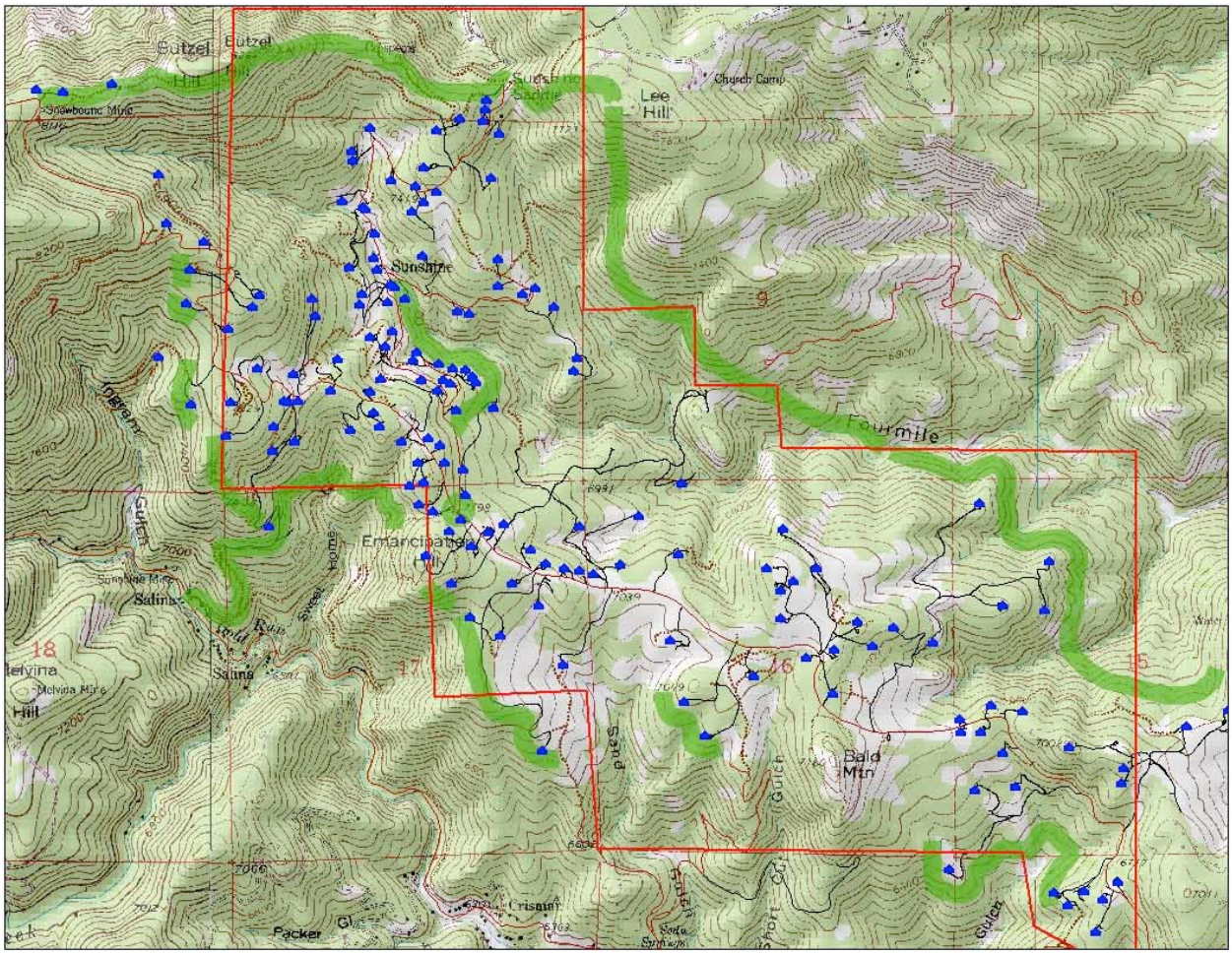
The series of driveways that services 3472 Sunshine Canyon Drive (Boulder Mountain FPD) currently connects to the Pinebrook Hills subdivision and the street of Bristlecone Way. Once Bristlecone is accessed, residential streets lead to Linden Drive and the City of Boulder. This escape route has been in existence for some time and remains passable for use today. However, some minor repair or maintenance may be necessary where the driveway passes through a locked gate and meets with Bristlecone Way. There is also a fire hydrant at this location and its use and maintenance should be explored with Boulder Mountain Water Authority who owns and operates the hydrant. Proper gate operation and locking codes should be confirmed and/or arranged.

Another route to Boulder exists in this area. It crosses private land through a gate at 138 Wildcat Lane, Pinebrook Hills, and is also accessible from 3472 Sunshine Canyon Drive. It has not been used for emergency egress in lieu of the Bristlecone route.

This route should be surveyed for road condition, gate access and fire hydrant availability and operation.

One other egress route may be available in this area. Recent construction on Wildhorse Circle in the Pinebrook Hills subdivision may be about to connect Wildhorse Circle and the driveway at 3472 Sunshine Canyon Drive. This route should be surveyed for road condition, gate access and fire hydrant availability and operation.

It is recommended that all three of the above egress routes be reviewed and one selected for "official" use. Coordination with Boulder Mountain FPD, including possible signage and evacuation procedures should be established.

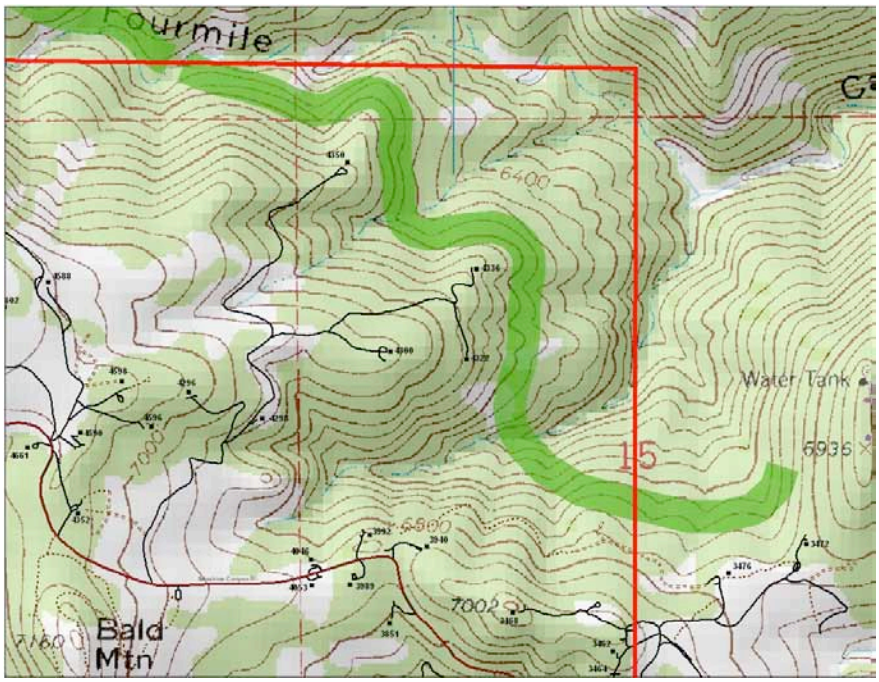


Map 22: Proposed SFPD Fuel Breaks

8.3 SPFD Fuel Breaks/Fire Lines

This district is extremely susceptible to flame fronts that gain momentum through thousands of acres of over-grown, and in many cases, unhealthy pine forests. A significant number of properties can only be protected by the establishment of proper Defensible Space around each home, followed by connection of these spaces with short fuel breaks or extensions of Defensible Space. This effectively would connect all "D" Space areas into one fuel break surrounding a neighborhood or community. In potentially severe threat areas, true fuel breaks ranging from 100 feet to several hundred feet wide will be necessary in order to increase safety by a significant amount. In all listed fuel break projects, specifications for the amount and width of tree thinning should be in accordance with the Colorado State Forest Service guidelines, with consideration given to the steepness of the slope, the values to be protected and the existing and projected fuel load.

The following projects have been identified as required in order to lower the danger to the Sunshine values at risk. These projects are listed according to their priority.

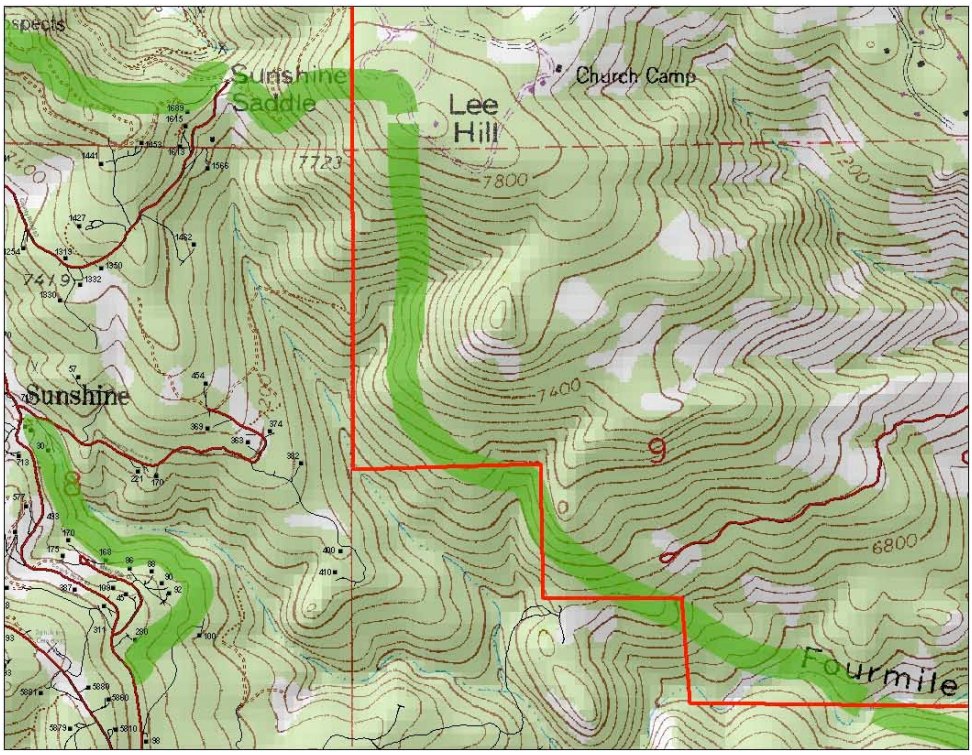


Map 23: Star House Fuel Break

A. Star House Fuel Break

Several years ago, with the cooperation and funding of area homeowners, a significant fuel break was constructed by the Boulder Mountain Fire Authority wrapping around the west side of the Pinebrook Hills subdivision. This break started at approximately the western termination of the Ann U. White Recreational Trail along the Fourmile Canyon Creek and proceeded south up the mountainside to just under the Pinebrook houses on Wildhorse Circle. This effort terminated just before reaching The Star House, a private meeting place at 3474 Sunshine Canyon Drive. It is projected that a continuation of this firebreak would provide significant protection to the entire Sunshine District, along with specific protection to the houses on the Northeast aspect of the "Sunshine Ridge" and the old Town Site of Sunshine. The watershed of Fourmile Canyon Creek is extremely inaccessible and a canyon of uninterrupted pine canopy. Frequent lightning strikes and wind driven fire events are a major concern to the inhabitants of this area. Likewise, continuing this fuel break could mitigate down-slope winds driving a westerly fire toward the Carriage Hills community.

The Star House Fuel break should be constructed from the end of the previously mentioned break, just north of the Star House building (3476), follow parallel and north of an existing forest road, and move northwest to meet with the defensible space around the homes at 4322 and 4336 Sunshine Canyon Drive, while crossing the south fork of the Fourmile Canyon Creek. The break should then continue northwest down slope to the Fourmile Canyon Creek middle fork and back upslope to just below and east of the house at 4350 Sunshine Canyon Drive. After again proceeding northwest the break should terminate at the main Fourmile Canyon Creek. The actual route of this break may be adjusted as necessary to utilize natural and man-made fire barriers.



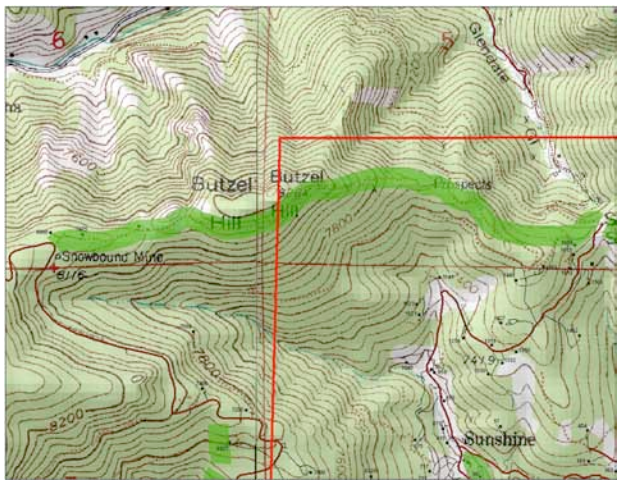
Map 24: Church Camp and County Road 83J Fuel Breaks

B. Church Camp Fuel Break (continuation of Star House Fuel Break)

Once the Star House Firebreak is constructed, continuation of that break should be made starting at the main Fourmile Canyon Creek northwest of 4350 Sunshine Canyon Drive, continuing northwest to the west side of a false peak south-southeast of Lee Hill, then proceed north-northeast to the west and below a second false peak rock outcropping. From there, the fire break should terminate at the peak of Lee Hill, or wrap around to the south of the peak following the Church Camp trail with termination at Mine Lane or another appropriate point. As previously suggested, the actual route of this break may be adjusted as necessary to utilize natural and man-made fire barriers. Previously burned areas from the Church Camp Fire (circa 1989) could be utilized.

C. County Road 83J Fuel Break

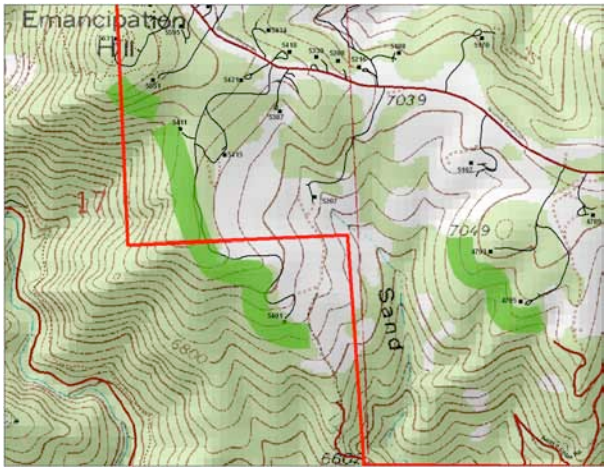
A portion of County Road 83J (recently re-designated as having No Name) runs from the Sunshine Saddle east and northeast to a point northwest of the top of Lee Hill where it meets Mine Lane. This short fuel break would connect the Church Camp and Butzel Hill Fuel Breaks, following the unmaintained County Road 83J/No Name.



Map 25: Butzel Hill Fuel Break

D. Butzel Hill Fuel Break

This proposed firebreak would follow the ridge top of Butzel Hill, proceeding from the Sunshine Saddle at the termination of County Road 83, to the top of Butzel Hill and to the Snowbound Mine at approximately 8000 Sunshine Canyon Drive. Boulder County and The U.S. Government (BLM) owns most of this land. The actual fuel break might best follow the existing social trail that skirts the mountain peak to the south.



Map 26: Southside Defensive Space Fuel Break

E. Southside Defensive Space

Because of the varied and difficult terrain in the south portions of the SFPD, construction of a defensible space "bridge" is encouraged from Ingram Gulch to Emancipation Hill to Bald Mountain. As with all homes in the fire district, education should be provided, as well as financial incentive, to encourage property owners to effectively manage the lands immediately around their homes. From this base, small fuel breaks or forest thinning should connect these spaces to effectively provide a fire mitigated area around the entire south side of SFPD.

Map 27: C. Southside Defensive Space, F. Sweet Home, G. Town Site and H. Sunshine Intersection

F. Sweet Home Fuel Break

Private property owners on Emancipation Hill have initiated a firebreak wrapping southwest around the peak. It is proposed that this firebreak be continued mid-mountain counterclockwise around the bowl of Sweet Home Canyon and be tied into fire mitigation alone County Road 89N. Using the county road, the firebreak should continue south-southwest and terminate at the community of Salina. Many old roadbeds and social rails exist in this area. These could possibly be utilized as a basis for break establishment.

G. Town Site Fuel Break

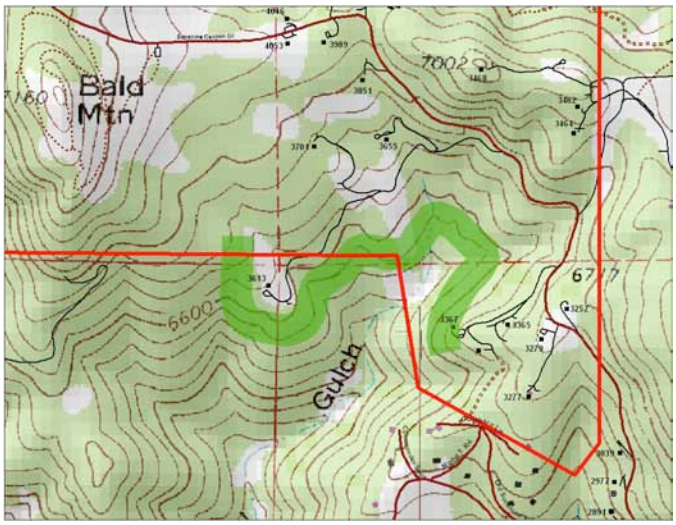
Since the demise of mining in the town of Sunshine, the town site has become overgrown with trees, reducing the meadow area along County Road 83 and providing little protection from the Fourmile Canyon Creek drainage to the historical properties here. To mitigate this danger and increase the viability of the forest, additional tree thinning and forest management is desired from the Sunshine Fire Station #1 at 311 County Road 83 to the Old Empire Mine on County Road 83, continuing to a point on Whispering Pines where the driveway of 57 Whispering Pines begins. If possible, this mitigation should also continue below the homes on Misty Vale, down to the creek.

This break could be a combination of defensible space from the homes in the town site and general tree thinning throughout the area. Priority should be given to areas downhill from the county road and spread into the Fourmile Canyon Creek drainage as much as possible. This would provide significant protection to the homes on the County Road, as well as properties above on the hill along Sunshine Canyon Drive.

H. Sunshine Intersection Fuel Break

The intersection of Sunshine Canyon Drive and County Road 83 has been identified as a highly dangerous Zone for the SFPD. Viewing distances along the road are limited and area residents are concerned about the high speed of traffic at this confluence. Also, it is an important intersection for the collection of both residents and emergency personnel. It is vitally important that this intersection stay open for the safety of the community. Significant thinning of trees is

appropriate in this area with possibly enough removal to provide views uphill from County Road 83. Consideration of additional parking for emergency traffic is also part of this recommendation.



Map 28: Bald Mountain Extension Fuel Break

I. Bald Mountain Extension Fuel Break

Recent forest restoration at Boulder County's Bald Mountain Recreation Area has renewed a significant meadow area and significantly mitigated against fire southwest of the Bald Mountain parking lot. Using this area as an anchor, a fuel break should be constructed to continue southwest from this meadow and tie into, and/or create, effective defensible space around the home at 3613 Sunshine Canyon Drive. This break should circle clockwise around this property and follow the Dry Gulch watershed in order to meet the fire mitigation work that was completed in 2008 on the east bank (west aspect) of Dry Gulch, behind 3367 Sunshine Canyon Drive.

J. Meadow Restoration

At one time, most of the area now designated the SFPD was nearly treeless. Only a few meadows still remain from that era. Those areas are quickly being overtaken by both natural reforestation and the planting of trees by well-meaning, but unknowing residents who don't understand the value of meadows to western communities. Meadows are extremely important to the wellbeing of all forms of mountain wildlife. They also protect from fire by reducing the fuel load and increasing the general level of ground moisture. Preservation of these meadow areas is important to the health of our forests.

This report calls for a study of the area meadows and a plan to restore and maintain them. In areas where the meadows can not be restored, efforts should be made to reduce the influx of new trees, reduce the number of immature tree and prune the existing trees to help maintain their health. Efforts should be made to educate property owners and residents in regard to this issue.

This plan calls for restoration and management of SFPD meadows to the fullest extent possible.

K. Fuel Break Restoration and Maintenance

While listed as the last priority of firebreaks, restoration and maintenance should be an ongoing effort in this plan. Firebreaks or natural fire barriers that already exist need to be surveyed on a regular basis and maintained as necessary. Restoration of older firebreaks should be sought out and fortified as necessary.

8.4 Community Fire Mitigation Program

The SFPD consists almost entirely of privately owned properties. Since a very small percentage is public lands, fire mitigation efforts will depend largely on private funding and the willingness and desire of landowners to participate. This plan recommends that significant efforts be made to:

1. Educate the public on the need for fire mitigation on their property and how to maintain a healthy fire resistant forest
2. Provide funding when possible for mitigation on private lands with grants from both private and public agencies
3. Encourage projects that are visible to larger portions of the community, to help educate and enthuse others into action
4. Cooperate with SFPD residents in providing slash disposal by chipping, burning or hauling
5. Educate the public regarding the necessity of maintaining fire suppression access by fire and emergency responders
6. Develop communication instruments to keep the public informed of the progress of fire mitigation in the area (email/website(s)/direct mail/etc.)
7. Maintain a list of qualified, safe, cooperative and dependable forest contractors that are able to provide the mitigation services necessary
8. Consider the development of a SFPD Mitigation Crew to provide help to area residents
9. Maintain records and statistics of the work accomplished to facilitate further mitigation development, grant monies and community protection plans
10. Investigate and develop funding sources for the administration of these public fire mitigation efforts

8.5 Emergency Notification System

As emergency response in the SFPD becomes more complex and as the public's expectation of services increases, the need for residents to know what is happening during an emergency plays an integral role in the success of an emergency operation. Maintaining an efficient traffic flow to get responders to the incident, while at the same time keeping the public safe, is a difficult operation in a community with mountainous terrain and so few roads.

A request from area residents heard often and regularly is that they want to be immediately notified of impending or present dangers. They want to know if they might need to evacuate, and if so how and when. They want to know when an incident is taking place and whether they will be able to get home when needed. Many times, they want to know how they can help and who to talk to for continuing information.

Emergency responders also have a need to communicate with the public. The level of training necessary to successfully operate equipment and effectively work with out-of-district personnel usually makes accepting help from bystanders impractical and unsafe. Maintaining a right-of-way for fire vehicles and overhead personnel is extremely challenging. And teaching a property owner how to deal with an emergency during the actual crisis presents many problems.

A method for disseminating information to the public is becoming increasingly necessary. The following questions need to be studied and a plan devised to meet this communication need:

1. What information do emergency responders need to communicate during different types of incidents?
2. What types of information does the public feel it needs to know?
3. Who on an emergency incident has the necessary information?
4. What methods are available to communicate with the public?
5. Are the necessary personnel available on an incident to effectively communicate?
6. How will the person(s) contacting the public collect the necessary data?
7. Who will make the decision about what will be communicated?
8. How will these communication methods be arranged and financed?

Ways the public has already suggested to disseminate the required knowledge include:

1. Sirens placed throughout the fire district
2. Telephone callback systems (reverse 911)
3. Web site(s)
4. Email
5. Text messaging
6. Roadblocks with posted information
7. Community maps with procedures
8. Call-in telephone messaging systems
9. "Escape Route" road signage

8.6 Road Signage

Whatever systems are devised to deliver water, evacuate residents and route fire trucks, the narrow roads, dead-end driveways and mountainous terrain will always present difficulties in making SFPD a safer place to live. One method that would have a substantial effect on response times, confusion and traffic conflicts would be to post signs throughout the fire district that would direct both residents and emergency personnel.

SFPD's fire stations are generally at the "top" of the district. This was designed to make hauling heavy loads of water easier while going downhill to most emergency calls. However, mailboxes in the district tend to post their address numbers on the downhill side, making identification of house addresses difficult for fire fighters, especially at night. Many driveways support several houses, again making home identification hard.

The SFPD should install standard reflective house numbers visible at each driveway intersection along the district's four main roads. Signs should be readable from both directions and should indicate the house number of each house on that driveway. Along the driveway additional signs should be installed at splits in the roadway to identify the correct directions to individual homes.

Because not all fire trucks will be able to proceed to every home due to road size, truck size, turnaround space, passing room or encroachment of the forest, signage could be used to indicate to fire fighters which apparatus can successfully be used. These could be separate signs from the house number signs, or the house number signs could be color-coded for truck access at different intersections.

A goal of this plan is to establish escape routes from the district that utilized alternate roadways to separate evacuation traffic from incoming emergency responders. These routes could also provide alternate ingress when normal routes are blocked, as well as provide emergency access to forest areas otherwise unavailable. While plans and routes for these situations should include maps, it should be considered that escape route signs might be helpful along some or all routes.

All signage should conform to a standard format and material, and follow a style that will be devised to make location and installation consistent throughout the district.
Further considerations in this plan are the cost of signage materials, personnel to install and maintain the signs, and how to fund such a project.

8.7 Emergency Water Sources

Most of the SFPD sits along a ridge top and contains no standing or running bodies of water that can be used for fire emergencies. Likewise, no water system exists to deliver pressurized water along individual roads or to lone structures (i.e. fire hydrants). Home water supplies are either from water wells drilled between 280 to 800 feet deep or private potable water cisterns that are filled with water hauled from outside the district. All water used in fire suppression is stored in cisterns distributed around the district, provided by privately owned swimming pools or carried into the district from outside sources. The providing of adequate water has always been the most

important consideration in providing emergency fire protection in Sunshine.

Because of the lack of water and the difficulty in storing, transporting and delivering emergency water, insurance costs for most homeowners is quite high. The Insurance Services Organization (ISO) rates the fire district a class 9. Class 10 is the highest (worst) rating that applies to districts without a regular fire service. Substantial improvement in the level of danger and significant reductions in insurance premiums could be realized with an organized and dependable water supply system along with a properly trained fire department.

SFPD (a local volunteer fire department) in cooperation with surrounding fire districts has established a water delivery system that has successfully protected the area. However, with increased developed in the WUI, keeping up with this growth is becoming increasingly difficult. To further complicate the problems, reductions in volunteerism, the increasing complexity of services and training, the ever-growing demand of County, State and Federal government regulations and escalating costs, are challenging the ability of the community to meet its emergency water needs.

Future plans for the SFPD should include a serious study of current water distribution. This study should include:

1. How much and at what rate does water need to be available?
2. What areas of the district are not adequately served with water?
3. Where should new water cisterns be placed and how many are needed?
4. What routes will fire vehicles take to provide water to all areas of the district?
5. Do the above routes provide adequate access?
6. Where are roads/driveways too narrow to support continuous movement of water?
7. What dead end roads/driveways provide no turn a-rounds to keep water moving?
8. Are there areas where dry hydrants could be installed that would mitigate the need for water transport?
9. Where are areas where new homes can possibly be built?
10. Can these new homes be adequately added to the water system?
11. What fire apparatus would best meet the current and future needs of the district?
12. Would a pressurized water system better meet future requirements?
13. If there were a pressurized water system, where would it be, how will it be supplied and what will it take to maintain it?
14. What are the changing operating demands on the fire department in regard to water delivery and how will they have to change to meet those demands?
15. What ways are available to fund the necessary improvements?
16. Should the establishment of a Water District be considered?

8.8 Heliports

Emergency access is greatly restricted in this district. While there may be options for egress and ingress, sometimes the use of aircraft will be required. Helicopters can be used for both medical and fire evacuation. This protection plan supports the identification and maintenance of heliports in each of the six identified neighborhoods.

Only one heliport has been designated, and that was by a private land owner. If possible, the registration of that heliport needs to be maintained, whether by the property owner or the community. It should be a goal under this plan to identify further locations, facilitate their conformance with current FAA heliport standards, if necessary, and be properly register them with the FAA and Boulder County Communications.

In lieu of approved landing sites, unofficial sites could be designated that may not meet the FAA standard but would be appropriate for emergency use. These sites should include the surveying of GPS coordinates.

All heliport sites should be indicated on SFPD emergency maps and include GPS coordinates to facilitate their use in an emergency. A study should be made to identify the criteria necessary for an emergency use site. Funding to assist in the construction/maintenance of these sites should be investigated.

8.9 Wildland-Urban Interface Fire Code

Continued growth throughout this district is causing significant amounts of increased risk. More homes and more people will continue to raise the probability of fire, while also making values at risk in many areas, difficult if not impossible to protect. While Boulder County has made an attempt at establishing standards for new construction that promote fire safety, these efforts have fallen short of providing the necessary regulation to assure that new construction does not further reduce the safety of the present residents.

This protection plan encourages the Fire Protection District to establish, in accordance with State Statutes, a Wildland-Urban Interface Fire Code that meets at least the following criteria:

1. Promotes the increased safety of current residents and property owners
2. Is somewhat consistent with fire codes in other similar topographic areas in Colorado
3. Is established with the cooperation and input from the surrounding fire districts
4. Establishes standards for fire apparatus access, including driveway length, width and tree cover
5. Establishes standards for water availability, including required cisterns, hydrants, sprinklers, etc.
6. Requires a level of enforcement that does not overburden the all-volunteer fire department but provides protection not possible without a district fire code
7. Regulates necessary fire mitigation efforts

8. Applies to not only new construction, but also present structures, but may "grandfather" older structures
9. Meets with Boulder County approval and establishes joint enforcement with the county
10. Follows the general principles of the International Wildland-Urban Interface Fire Code

8.10 Fire Department Administration & Training

To implement the goals in this CWPP, the resources of the SFPD need to be considered. The department's ability to implement, assist in implementing, oversee, manage, coordinate or otherwise facilitate these programs needs to be determined. Like most all-volunteer fire departments, the SFPD is overwhelmed with administrative duties and training requirements. The fire department's level of involvement in the community, its knowledge of the subject matter and familiarity with the task at hand, make it the center of organizational activity under this plan. Local residents need to review who can and will oversee the above activities, and move to organize resources beyond the local fire department to accomplish these goals.

A Community Fire Mitigation Task Force needs to be established. This group will research funding sources available for each of the items in this CWPP. An ongoing effort to apply for grant money will be necessary to encourage development in the community, as well as fund the needed changes in the fire department. Initiation of this CWPP's projects will require resources not accounted for otherwise. Personnel, facilities, teaching aids and tools to educate residents as well as firefighters, and the infrastructure to actually perform the planned mitigation and administration outlined in this plan are assets unavailable at the time of this writing. Perhaps the first area of concern in this protection plan should be how to acquire these resources and how to fund the ongoing requirements of the community.

Increased fire department needs will include:

1. Meeting space; equipping, maintenance (building, heat, electricity, furniture, cleaning)
2. Transportation expenses
3. Training classes
4. Administrative personnel funding
5. Hardware; including tools, supplies, equipment
6. Insurance
7. Physical fitness programs and equipment
8. Personal protective gear
9. Office supplies

8.11 Education

In order for this CWPP to succeed a significant effort will have to be made to educate the SFPD community as to the area's needs and the plan's specifications. An education plan should be devised that informs the public of the goals of this CWPP, how individuals can participate, what knowledge they need in order to mitigate against fire and how they can best accomplish the projects outlined. This education plan should consider but not be limited to:

1. What would be the best way to communicate with each of the district neighborhoods?
2. What facilities may be necessary to hold meetings and planning sessions?
3. What materials and resources will be needed?
4. Who will be communicating with the public?
5. How often will meetings need to take place?
6. What ways are available to communicate progress and future requirements?
7. How will success of this education plan be measured?
8. How will education be funded?

Assessing further community needs and acquiring community feedback will be a large part of the two-way education process. Ongoing attempts should be made to assess the community's acceptance of the program and revise goals and methods, as well as this CWPP, as consensus mandates.

This education effort should include the following:

1. Training sessions to teach proper methods for "D Space" construction around individual homes
2. Classes to teach proper forestry methods, including the tools used and safety issues to be observed
3. Advisory sessions to inform residents of public interest issues, i.e. forest health, wildlife, emergency preparedness, emergency response
4. Goals and methods of this CWPP
5. Informational vehicles (web sites, emails, newsletters, etc.) to keep the public apprised of progress and future needs

8.12 Reevaluation and Maintenance

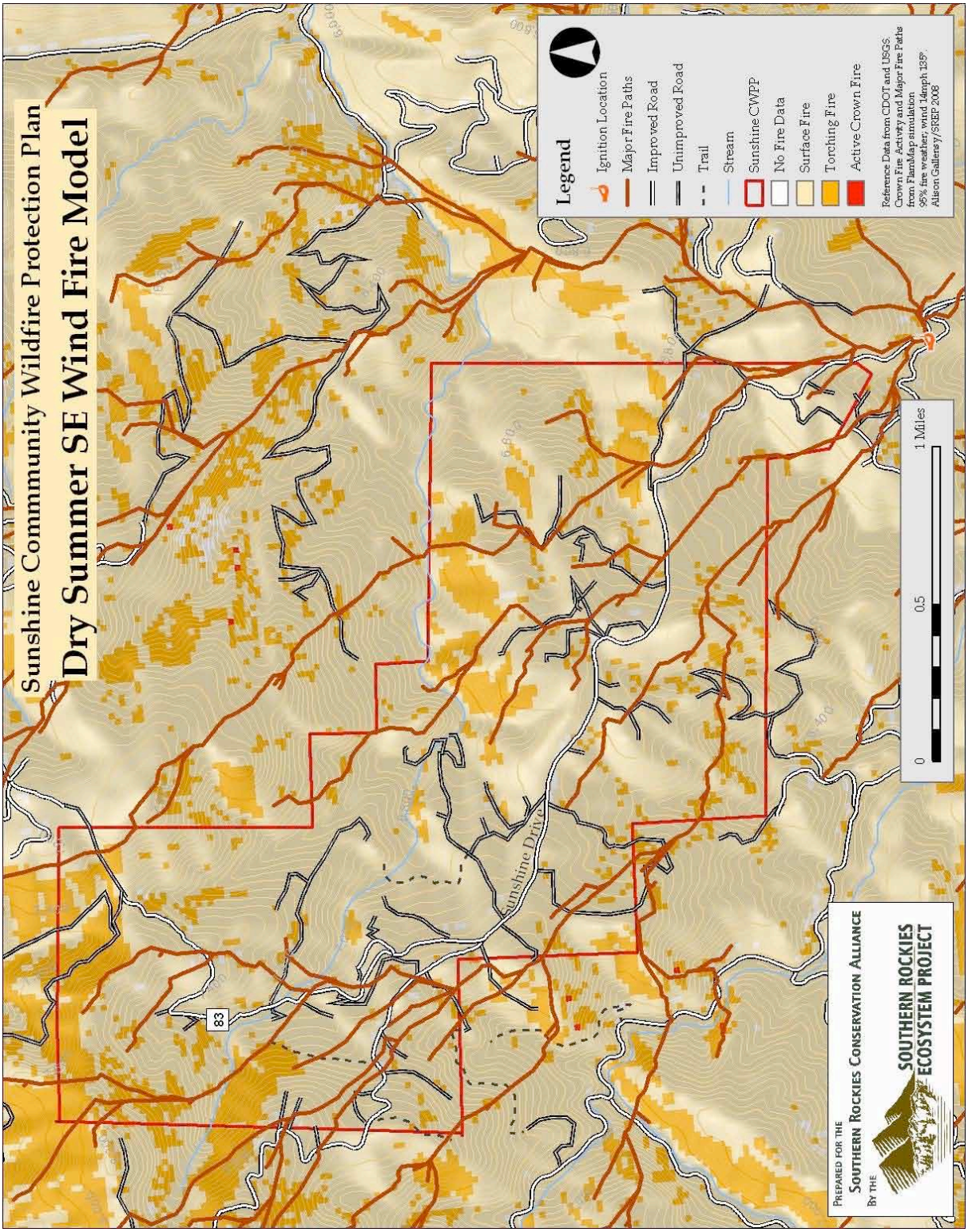
Whatever projects are adopted from this plan, a method must be devised to reevaluate any accomplishments to determine if those accomplishments are continuing to meet the needs of the community. This reevaluation should include:

1. Inspecting firebreaks
2. Inspecting roads, driveways and egress routes
3. Reevaluating community fire mitigation programs
4. Assessing emergency notification systems
5. Reviewing administrative methods
6. Inspecting and accounting for heliports
7. Inspecting fire mitigation along roads
8. Inspecting signage
9. Reevaluating the emergency water supply system and procedures
10. Reviewing the fire department's ability to operate the assets of the community
11. Assessing the health of the forest and its resistance to fire

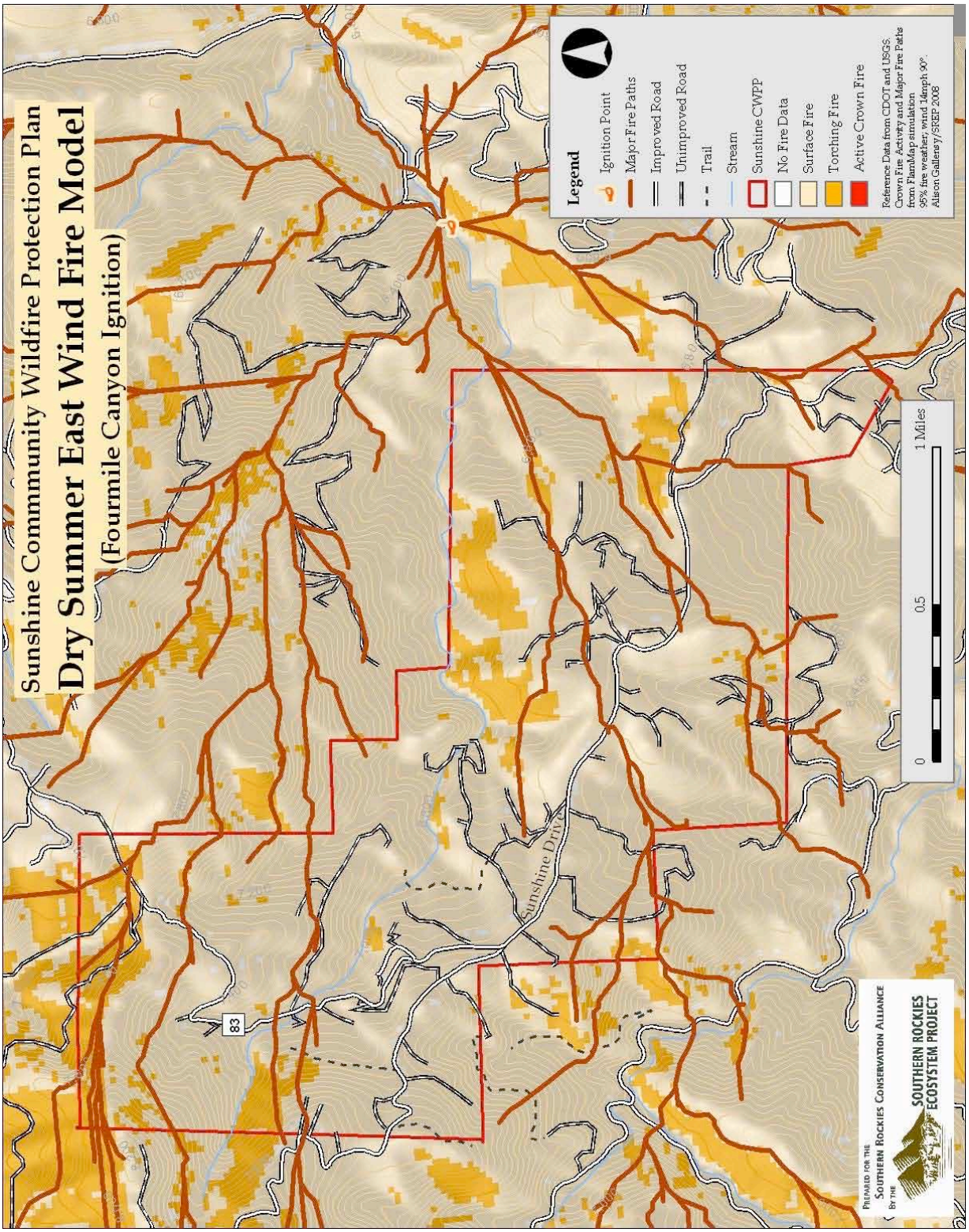
An ongoing form of maintenance must be set up to assure that the successes gained under this program are not lost. Mitigated area will need to be re-worked, hardware replaced and new personnel trained. Some of the more important protection items may need to be re-done or expanded before other programs on this list can be initiated.

APPENDICES

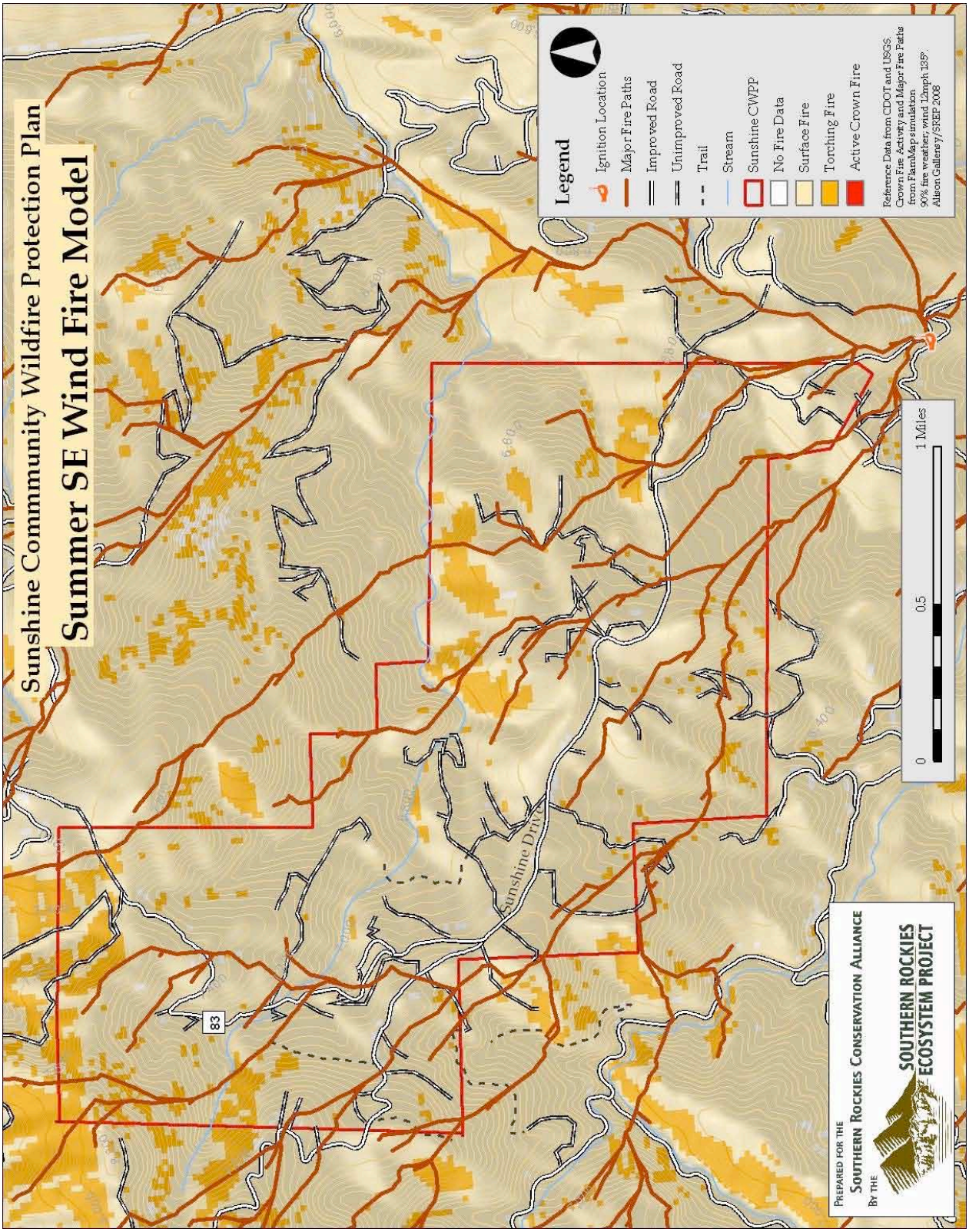
APPENDIX A: Maps



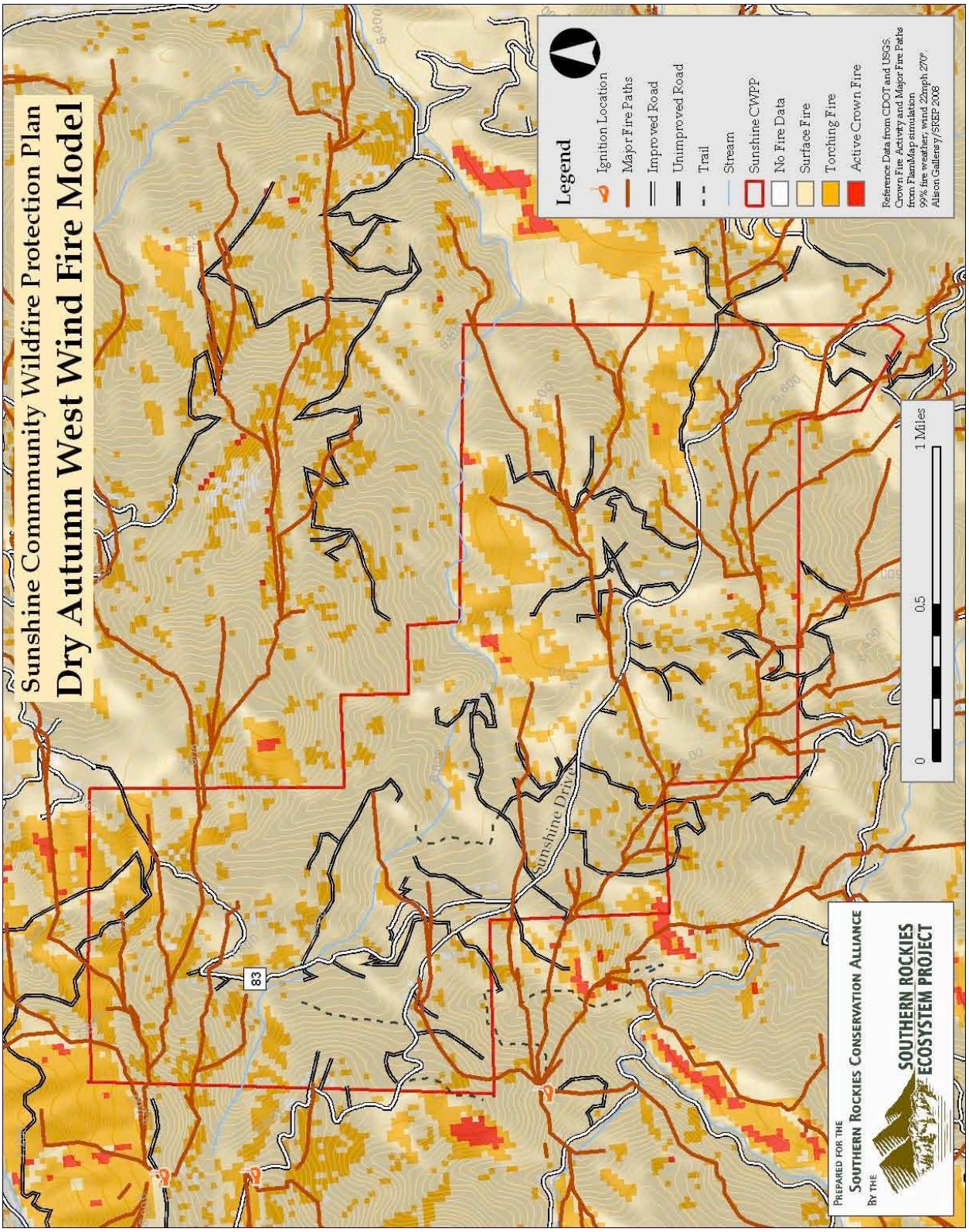
Dry Summer SE Wind Fire Model



Dry Summer East Wind Fire Model



Summer SE Wind Fire Model



Dry Autumn West Wind Fire Model

APPENDIX B: Home Hazard Assessment Questionnaire

ASSESSMENT QUESTION	OBSERVATION	RATINGS
ACCESS		
Street Signs		
	Present and reflective	0
	Present, not reflective	2
	Not Present	5
Community Road Ingress/Egress		
	Not applicable (live on paved road)	0
	Two directions to travel to paved road	0
	One road in and out to paved road	15
Width of Road between Driveway and Sunshine Canyon		
	Two lane easily passable	0
	Dirt two direction travel difficult, but possible	5
	One-way only	10
Visible Address		
	Present, reflective, and visible from two directions	0
	Present, but not reflective or not visible from one direction	2
	Not Present	5
Gated Access to Driveway		
	No	0
	Yes	5
Driveway Access		
	Not applicable (<100 ft long)	0
	100-300 ft, with turnaround	2
	>300 ft, with turnaround and pullout	3
	Inaccessible (>100 length, over 12% grade, or no turnaround)	15
Minimum 13' 6" Vertical Clearance for Driveway		
	Yes	0
	No	5

STRUCTURE		
Roofing		
	Tile, Metal, or Asphalt	0
	Non-rated (Wood)	25
Eaves		
	Not Present	0
	Enclosed, with fire resistant materials	1
	Enclosed, not fire resistant materials	3
	Not enclosed	5
Siding		
	Non-flammable	0
	≥6" Diameter Log Siding (not just split logs attached to siding)	1
	Mixed stone and wood	2
	Wood Siding	5
Decks/Porches		
	No Deck	0
	Enclosed deck or non-flammable composite deck	2
	Unenclosed with rock under deck	5
	Unenclosed with flammable materials under deck	15
NEARBY FOREST/TOPOGRAPHY Overall Avg Slope of the Area Within 150' of House		
	Flat (Less than 10%)	0
	Between 10-40%	5
	Greater than 40% (too steep to drive on, difficult to walk)	10
Dangerous Topography (Chimneys, Box Canyons, Saddles)		
	More than 150ft from home	0
	Less than 150ft from home	10

STRUCTURE		
Combustible Materials Against House (Check all that apply)	None Present (dirt/rock)	0
	Light Flashy Vegetation (grasses, needles, cones)	5
	Shrubs (junipers or flammable shrubs, not flowers)	5
	Coniferous Trees	5
	Unenclosed Firewood within 30'	5
	Construction Debris/Flammable materials/Trash	5
Vegetation Near Roof	None within 5 feet	0
	Limbs within 5 feet	3
	Overhanging Limbs or needles on or in roof/gutters	5
Defensible Space Zone 1 (15' from structure)	Conforming (15' spacing between structure and any trees)	0
	Non-conforming (Needs some thinning/ladder fuel removal)	5
	None (needs a lot of thinning)	10
Defensible Space Zone 2 (30'-100' from structure)	Conforming (average 15' spacing between clumps of trees)	0
	Non-conforming (needs some thinning/ladder fuel removal)	3
	None (needs a lot of thinning)	10
Defensible Space Zone 3 Forest Cover (>100' from structure)	Light (open stand, average of $\geq$15ft spacing between tree crowns)	0
	Moderate (trees with some crown spacing 5-15ft average)	7
	Heavy (Continuous dense tree crowns or ladder fuels)	15

WATER/UTILITIES		
Water Source Availablity		
	Pressurized Hydrant in community	0
	Cistern/Dry Hydrant on-site	2
	Stream/Pond/Pool on-site	3
	Community Cistern/Dry Hydrant nearby	4
	Stream/Pond nearby in community	5
	None	15
Placement of Propane Tank		
	Underground or not present	0
	Above ground with no vegetation concerns	3
	Propane is within 50' of house or has vegetation within 3' of tank	5
Placement of Power Lines		
	Underground or not present	0
	Above ground with no vegetation concerns	3
	Dead branches above or live branches within 3' of power line	5
SUMMARY		
Specific Recomendations the Homeowner Should Mitigate		
	Post visible address marker	
	Grade driveway or access road	
	Cut back vegetation along driveway	
	Move firewood to area 30' from structure or flammable vegetation	
	Mow near home	
	Clear around propane tank	
	Clean under deck or home	
	Clean roof and gutters	
	Move construction materials/debris	
	Remove ladder fuels	
	Thin trees in defensible space	
Hazard Rating	Total:	
	Moderate (<75)	
	High (75-150)	
	Extreme (>150)	

Notes on Survey Questionnaire

Street Signs:

All houses on Sunshine Canyon Dr. get a 0
All houses on or accessed from CR 83 get a 2 since the CR 83 sign is only visible from one direction

Community Rd Ingress/Egress:

A Driveway serves only one home. Any "driveway" or road that is used to access multiple homes is a "Community Road". For our purposes, "not applicable" would be checked for any home that does not share a driveway. For all others, choose appropriate rating.

Width of Road Between Driveway and Sunshine Canyon:

This was slightly mislabeled, since it also includes between driveways and CR 83 or Misty Vale.
This question applies to homes reached by communal driveways and to homes on Whispering Pines. If so, evaluate. All others get a 0.

Visible Address:

Can you see it from both directions?

Gated Access to Driveway:

If there's a gate, even if it's always open, give it a 5, otherwise a 0.

Driveway Access:

A "driveway" is the spur that leads to the individual home from either the main road or the "community road". In the case of the shared driveway/community road, this is the part that isn't shared
A "turnaround" is a place 50'-100' from the home where a fire truck could turn around. Eric has a handout which I'll send a link to.
If one characteristic is missing from the response rating, bump to the next rating class (ie >300ft w/out turnaround goes to 15 points)

Minimum Vertical Clearance:

This refers to driveways only. This refers to overhead branches (can a firetruck drive through w/out scraping the top?)

Trees w/in 10' of Driveway:

Refer to earlier definition of "driveway". The 10' setback refers to the tree trunk, not encroaching branches.

Roofing:

Pretty self-explanatory. Refers to the roof only.

Eaves:

The "eaves" are the part of the roof that overhangs the house.
Most homes will have enclosed eaves.
You will see exposed 2x4 rafters on "not enclosed" eaves

Siding:

Non flammable = stucco, concrete, hardiplank (fake wood, look for repeating patterns)
6" diameter logs is like old-style chinked log homes
Mixed wood and stone should have stone below, wood above

Decks/Porches:

This does not refer to a front stoop.
Enclosed deck means NOT cantilevered out over the ground.
Unenclosed with rock means rock w/out weeds or flammable objects under the deck.

Overall Avg. Slope w/in 150' of House:

Most homes in our district are on a 10-40 degree slope. Use the topo map, if the lines are closer together than the usual, bump it to the higher category (this only applies to a few homes in SFPD)

Dangerous Topography (Chimneys, Saddles, etc.)

A chimney is a gully. Using the topo map, look for where the lines V toward a home.
A saddle is the low spot where 2 ridges meet…look at the topo.

Combustible Materials Against House:

In this category ONLY, check ALL that apply. "Against" means w/in 3'.

Vegetation Near Roof:

This pretty much refers to tree branches touching the roof.

Defensible Space Zone 1 (15' from Structure)

Are there tree trunks or branches w/in 15' of the home? No, 0.
A few, give it 5 points
A lot, give it 10 points

Defensible Space Zone 2 (30'-100' from Structure)

Use your best judgement.
"Ladder fuels" are small trees or debris leaning against larger trees that will lead the fire from the ground to taller trees.

Defensible Space Zone 3 (over 100' from structure)

Most homes will rate 7 or 15 points here, unless they're in a meadow, have a small parcel, or have really mitigated!

Water Source Availability:

No one in our district has a hydrant.
Cistern/Dry Hydrant means you can see plumbing attached for SFPD hookup. Individual cisterns apply for the corresponding home ONLY to rate 2 points. These are blue dots on the topo map.
The individual cisterns do not apply to other nearby homes (not enough water in them for multiple homes in a fire situation)
On your map, cisterns for SFPD use are either blue or yellow PENTAGRAMS (not blue dots)
"Stream" means perennial, we have none in our district.
Comm. Cistern Nearby: "nearby" = w/in 1000' or _" on topo. This applies to either a yellow or blue pentagram on map.

Placement of Propane Tank:

Vegetation concerns are flammable materials within 3' of the tank.

Placement of Power Lines:

Newer houses should have their lines buried
If lines attach to house but clear back to the pole, give 3 points
Needs work, give 5 points

APPENDIX C: CWPP Stakeholders and Task Force members

The creation of the Sunshine Fire Protection District Wildfire Protection Plan (CWPP) involved the following Federal, State, County and community representatives:

CWPP Stakeholders	
Steve Stratton	Sunshine Fire Protection District, Chief
Brett Habestick	SFPD/ CWPP Coordinator
Abby Silver	CWPP Task Force Coordinator
Eric Phillips	Wildfire Mitigation Coordinator – Boulder County Land Use Development
John Chapman	Community Wildfire Protection Plan Coordinator – Southern Rockies Conservation Alliance
Allen Owen	District Forester, Colorado State Forest Service
Bob Bundy	Colorado State Forest Service
Debbie Bellew	Representative, Bureau of Land Management

Community CWPP Task Force Coordinators	
Brett Haberstick	Task Force Coordinator/Editor
Abby Silver	Task Force Coordinator
Henry Ballard	Task Force Coordinator - Assessments
Deirdre Damron	Secretary
Johanna Hurley	Assistant Secretary
Mary Mesch	Team Sunshine Leader
Wanda Stratton	Community Outreach coordinator
Steve Stratton	SFPD Fire Chief

Community CWPP Task Force
Peter Beresford, Don Dick, Suzanne Ewy, Attilio Framarini, Lori Heflin, Jen Lansky, Steve Lavington, Kim Neill, Jim Peacock, Martha Peacock, Ardie Sehulster, Elaine Smith, Ian Stewart, David Tresemer, Jeannie Van Etten,

APPENDIX D: Task Force Meeting Schedule and Community Outreach Events

Sunshine CWPP Task Force Meeting Schedule & Agenda	
June 3, 2007	Concept of CWPP presented at Community Flapjack Fling
June 11, 2007	Initial meeting of the CWPP Task Force
June 25, 2007	Review of four local CWPPs
July 9, 2007	Established timelines
July 24, 2007	Initial planning for community gatherings and individual responsibilities for CWPP tasks
August 6, 2007	Home assessment identified and community gatherings planned
August 27, 2007	Community gatherings planned, assessment timelines determined
September 12, 2007	Home assessment training
November 8 to November 25, 2007	Assessments and data collection
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January 17 to February 29, 2008	Data analysis and review meetings with CSFS and other stakeholders
March 24, 2008	Review data analyses and neighborhood summaries
March 31 to May 5, 2008	Planned neighborhood gatherings – Community outreach sub-committee
May 7, 2008	Draft CWPP recommendations
June 8, 2008	Presentation of Sunshine CWPP at Community Flapjack Fling

Sunshine CWPP Task Force Sub-Committee – Community Outreach	
September 16, 2007	Wildfire Risk presentation and panel discussion for Sunshine community residents
May 21, 2008	Community gathering: Bald Mountain, Meadows, and Pilot neighborhoods discussion
May 27, 2008	Community gathering: Town Site neighborhood discussion
May 29, 2008	Community gathering: Ingram neighborhood discussions
June 4, 2008	Community gathering: Dry Gulch neighborhood discussions
September 6, 2008	Present completed CWPP to Sunshine community

Appendix E: Example Documents

Sunshine Community Letter: September 2007

Fire... We in the Sunshine Fire Protection District live with the threat of it daily. Last year, when a 5-acre blaze broke out near the three-mile marker of Sunshine Canyon, firefighters ordered the evacuation of over 200 homes.

Luckily no one was injured and no homes destroyed. But what's to stop a driver from mindlessly tossing a cigarette butt out of the car window on a dry, windy afternoon and sparking a fire that flashes into a raging inferno? Or from lightning striking a tree that bursts into a blaze?

Even though none of us can control situations like these, we can work to reduce the risk of wildfire. Like many of the fire protection districts adjacent to ours, several Sunshine neighborhood volunteers have been working together to establish a Community Wildfire Protection Plan (CWPP) that will not only identify high risk areas of our community, it will provide data analysis and plans of action to mitigate those most vulnerable sections. What's more, this plan will be the document necessary for our community to apply for grant money, helping us offset expenses like building shaded fuel breaks, widening roads, felling and trimming trees, etc.

Beginning September 17, a neighborhood team of data collectors will be dispatched to each and every neighborhood within the Sunshine Fire Protection District. You may see one sauntering down your driveway, clipboard in hand, checking a list of questions that include, but are not limited to:

- What type of roofing material do the homes in your area have (shake shingles, concrete, tile, or metal)?
- Is there defensible space around each home? (This is often the most effective first line of defense in the event of a wildfire).
- If there is decking on the home, what is it made of?

All of these questions and more will be answered by our data collectors and then, as a whole, our community will be analyzed by our fire-fighting experts, determining those pockets within the Sunshine Fire Protection District that pose the highest threat to structures, human and wild life.

You can identify our data collection crew by their red t-shirts with the word "Sunshine" written on the back in reflective lettering. If you see a volunteer, please feel free to stop him or her and ask questions. (See the list below for names of our volunteers).

Better yet, come to Fire Station #2 (5880 Sunshine Canyon Drive) at 9:30 Sunday morning, September 16, to hear a panel of experts explain the ever-present risk of fire in our mountain community, and the value and details of developing this CWPP. John Hilson (a former Sunshine neighbor and fire fighter now living in Gold Hill) will present a slideshow and discuss the inevitable risk to our forests as well as the benefits and limits of mitigating. Bob Bundy, Boulder's Coordinator for Colorado's Forest Service, John Chapman, Wildfire Planning Outreach Coordinator, and Eric Philips, Wildfire Mitigation Coordinator for Boulder County also will bring their expert knowledge to our meeting, rounding out the features of a CWPP, and addressing your questions and concerns.

During this meeting, we also want to hear from you. Where do you see potential danger in your neighborhood? What is it? And how do you think the situation can be remedied?

In Sunshine style, Team Sunshine will provide coffee and breakfast nibbles.

Door Hanger
Fall 2007

* * * * *

Dear Neighbor,

Thanks for letting us visit and evaluate your property for our Community Wildfire Protection Plan.(CWPP)

On _____ (date), your property was scanned by: _____, a member of the Sunshine Fire Protection District CWPP Task Force to assess the following aspects of your home:

- Building Material
- Landscape
- Defensible Space
- Water Availability
- Fire Truck Access
- Vegetation Type & Density

Like many of the fire protection districts adjacent to ours, several Sunshine neighborhood volunteers have been working together to establish a Community Wildfire Protection Plan (CWPP) that will not only identify high risk areas of our community, it will provide data analysis and plans of action to mitigate those most vulnerable sections. What's more, this plan will be the document necessary for our community to apply for grant money, helping us offset expenses like building shaded fuel breaks, widening roads, felling and trimming trees, etc.

The information gathered today will be used to compose a document showing where the high risk areas are located. Your property will not be singled out in any way, nor will this information gathered be used for anything other than the CWPP document.

Thank you for your cooperation,

The Sunshine Fire Protection District Task Force.

Community Meetings Invitation: Spring 2008

The Sunshine Canyon Fire Protection District
CWPP Task Force
invites you to a
SPECIAL MEETING with your neighbors

Come and learn about the
Community Wildfire Protection Plan
Neighborhood Risk Assessments
Mitigation Recommendations

NEIGHBORHOOD MEETINGS SCHEDULE

* All meetings to be held from **7:00 to 8:30 pm** *

"Bald Mountain, Meadows and Pilot Neighborhoods"
#4296 to #5657 Sunshine Canyon Dr.
Wednesday, May 21, 2008
at the Sehulster/Tidball Home
4795 Sunshine Canyon Drive
RSVP: sehulster58@aol.com

"Town Site Neighborhood"
CR-83 including Mistyvale,
and Whispering Pines
Tuesday, May 27, 2008
at Firestation #1 on CR-83
RSVP: deirdre_damron@hotmail.com

"Ingram Neighborhood"
#5695 to #7000 Sunshine Canyon Dr.
Thursday, May 29, 2008
at the Hurleys' Home
7000 Sunshine Canyon Drive
RSVP: jchurley27@aol.com

"Dry Gulch Neighborhood"
#2889 to #4053 Sunshine Canyon Dr.
Wednesday, June 4, 2008
at the Peacocks' Home
4596 Sunshine Canyon Drive
RSVP: martha@mythosandcompany.com

If you cannot make the meeting in your own neighborhood
please choose another meeting that might be more convenient.

Please, please, please . . . . . RSVP!

QUESTIONS?

Call Johanna Hurley: Johanna.Hurley@gmail.com 303-440-7227,
Abby Silver: Abberoo@msn.com 303-442-1253
Deirdre Damron: Deirdre_damron@hotmail.com 303-544-0273
Evenings please

Neighborhood Meetings AGENDA
Spring 2008

Greeting: thank host, introduce facilitators

Brief Description of CWPP (CWPP Overview)

Describe Neighborhoods (Map)

Explain assessment process

Distribute Individual assessments

Neighborhood Summaries and Recommendations

Depict what would happen if a fire broke out at the intersection of CR-83 and Sunshine Canyon Drive.

Discuss the Need for Fundraising:

- Grants with matching contributions from community
- Contributions
- Mill levy on Ballot

Conduct Straw Poll re: preferred fundraising method

Q&A:

Distribute response form: "What do you want to see happen in your neighborhood" (sheets of paper provided)

HANDOUTS:
(Collect at the end of the evening if possible)

CWPP Overview (D. Damron)
Neighborhood summaries and recommendations (CWPP)
Personal Property Mitigation flyer
Individual Assessment Forms

Large Maps: Neighborhoods and Fire Paths