Community Wildfire

Protection Plan

September 19, 2008

Prepared For

Hidden Village Property Owners Association

By

Hidden Village Fire Mitigation Committee,

And

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The Hidden Village Community Wildfire Protection Plan was collaboratively developed. Interested parties, including Hidden Village homeowners, South Metro Fire Rescue Authority, Douglas County Public Works, Douglas County Wildfire Mitigation Staff, Douglas County Emergency Management, and the Colorado State Forest Service, participated and provided input to the process.

The CWPP identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect Hidden Village. It also recommends measures to reduce the ignitability of structures throughout the area.

The following community representatives/agencies have reviewed and support this Community Wildfire Protection Plan.

Hidden Village POA

South Metro Fire Rescue Authority

11-17-08

Colorado State Forest Service
Franktown District

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Warning and Disclaimer: The degree of protection from wildfire hazards intended to be provided by this plan is considered reasonable for planning purposes, and is based on accepted forestry and fire science methodology. This plan is intended to aid the community in minimizing the dangers, costs and impacts from wildfire hazards. Fire is a natural force and historical part of the ecosystem. Therefore, unforeseen or unknown wildfire conditions or natural or man-made changes in conditions such as climate, vegetation, fire breaks, fuel materials, fire suppression or protections devices, and ignition sources may contribute to future damages to structures and land uses even though properly permitted within designated wildfire hazard areas.

INTRODUCTION AND ACKNOWLEDGEMENTS

The Hidden Village Property Owners Association Community Wildfire Protection Plan (CWPP) is a broad plan focused on the protection of residents, structures and scenic environment of the Hidden Village community from catastrophic wildfires. The CWPP represents a collaboration of Colorado State Forest Services, South Metro Fire Rescue Authority, Hidden Village Property Owners Association, and its Fire Mitigation Committee. The CWPP is intended as a *living document* and will be updated as wildfire mitigation and firefighting methodologies and support technologies change. The Hidden Village CWPP is sponsored by the South Metro Fire Rescue Authority. This CWPP follows the guidelines set forth in the *Health Forest Restoration Act of 2003* and the *Colorado State Forest Service Minimum Standards for Community Wildfire Protection Plans* (See Appendix H).

ACKNOWLEDGEMENTS

Special thanks for support and materials for this Community Wildfire Protection Plan go to:

- South Metro Fire Rescue Authority and its fire fighters
- Colorado State Forest Service
- Douglas County Open Space Department
- Douglas County Sheriff's Office, Office of Emergency Managment
- Hidden Village POA Board of Directors
- Douglas County Public Works Department
- Douglas County GIS, and Assessor Mapping groups

Appreciation is also extended for information and support material to:

- Intermountain Rural Electric Association
- Douglas County Public Library
- The many residents of Hidden Village who took time from their busy schedules to guide this document to its completion

EXECUTIVE SUMMARY

The Hidden Village Community Wildfire Protection Plan (CWPP) is sponsored by the Hidden Village Property Owners Association (HVPOA) for the safety of life and protection of property in Hidden Village neighborhoods and their immediate vicinity. Participation in the establishment of this CWPP was a broad stakeholder group including Colorado State Forest Service (CSFS), South Metro Fire Rescue Authority (SMFRA), Douglas County Public Works Department (DCPW), Douglas County Park and Open Space (DCOS) and Douglas County Office of Emergency Management (DCOEM). Development of this CWPP focused primarily on wildfire hazard identification, fuel mitigation and emergency response. Wherever possible, other values such as wildlife habitat enhancement, forest health restoration, improved aesthetics and increased property values will be factored in.

The Hidden Village area is no stranger to wildfires and the need for wildfire prevention and protection. The media coverage of Cherokee Fire (2003, 1,200 acres), the Buffalo Creek Fire (1996, 11,000 acres), Hi Meadow Fire (2000, 12,000 acre) and the Hayman Fires (2002, 138,000 acres) emphasized the fact that wildfires "*can happen here*!" In 2003, the HVPOA recognized the importance of developing a program to address the wildfire risk to the community. It began by investigating funding sources for fuel treatments and development of a long range plan for wildfire protection. The HVPOA has been guided by a committee of concerned residents of the community that formed the Firewise Committee to advise the Hidden Village Property Owners Association Board of Directors. Some of the committee members have worked in the past with PFPD and CSFS personnel to address the wildfire issue on their individual properties.

The community has significant areas outside of their boundaries that could pose a potential wildfire fire threat to the community. These areas, termed in total as the *Wildland Urban Interface* (WUI), consist of all lands bounded by Colorado Golf to the west, un-incorporated Douglas County to the east, The Town of Parker to the north, and The Pinery and Bennett property to the south. A major land holding, known as the Whittlsey Property, is located in the middle of the Hidden Village community.

With this CWPP, care was taken to propose and provide mitigation within the neighborhoods to provide fuel treatments to lower the risk of spreading wildfire and to protect residents from potential wildfire intrusion from the various risk sections of the adjoining WUI. Mitigation for these areas will be reviewed annually for scheduling with full completion to take from eight to fifteen years, depending on availability of funds from multiple sources. Fuel treatment is not a one-time event. Maintenance may be required on a periodic basis to remove ladder fuels and/or re-open stands with crown closure.

Four primary strategies are employed to achieve mitigation: 1) Providing fuel mitigation treatment to HVPOA owned land and critical private parcels; 2) Encouragement and support of private land owners doing their own wildfire fuel mitigation; 3) Working with the SMFRA and other stakeholder agencies to assist developers of stand-alone, undeveloped areas within zones surrounding the HOA's to mitigate their land before building occurs per Section 17, Douglas County Zoning Ordinance; and 4) support of on-going fuel and future treatment projects on Douglas County properties.

This CWPP identifies the response, both from professional agencies and volunteer groups that may be employed for wildfire protection or fire suppression, arresting wildfires threatening areas within or outside the HVPOA. Douglas County Sheriff's Office, represented by DCOEM, in conjunction with SMFRA has the primary responsibility for protecting life and property in the HVPOA in the event of a wildfire incident. If a wildfire event is beyond SMFRA resource capability, the DCOEM (inclusive of SMFRA) is party to a mutual aid agreement for support from other Douglas, El Paso and Arapahoe County fire departments.

The HVCWPP also discusses direct communication and informational efforts to notify residents and keep them apprised of emergency wildfire situations directly affecting them. Communication and support of the general public is available and determined by different intensities of identified emergencies.

The implementation of this plan takes place over multiple years, limited for the most part by the available funding that can be directed to the various efforts within the plan. Risk priorities as well as future residential development locations and development densities will be reviewed annually and used in scheduling fuel mitigation projects. Projects deemed to have the most significant wildfire prevention impact will be given priority. The current profile of the projects is depicted in Appendix A.

This CWPP is a "*living*" document that will be evaluated and maintained annually as a responsibility of the HVPOA Board of Directors, and Environmental/Architectural Control Committee. Each individual project identified within this plan has a measured baseline; i.e., current condition description of it's "*before*" profile that will be used to evaluate the effectiveness of any fuel reduction project performed on it during the plan year. Consequently, this plan may be amended and edited annually to assure that it stays viable and achieves its original intent. Annual meetings should be held with stakeholder agencies to review the progress and effectiveness of this CWPP. A general public meeting should also be conducted annually to receive public input.

GOALS, PLAN COMPONENTS & ON-GOING MAINTENANCE OF PLAN

Primary Purpose

The Hidden Village Community Wildfire Protection Plan (HVCWPP) was developed for the safety of life and protection of property from wildfire emergencies within the boundaries of the POA and the adjacent surrounding areas while upholding the ecological values of the community.

The plan was developed by a broad stakeholder group identified in the *Foreword* section of this document. The HVCWPP addresses the areas of wildfire hazard mitigation and emergency response to the impact of widespread wildfires. The plan has three major focus areas: fuel mitigation, emergency response and the influencing and obtaining of private, state or federal assistance. In addition, the plan contains administrative detail for plan implementation and monitoring and also sets forth tactics for amending the plan on an on-going basis as circumstances and changing conditions may require.

Goals and Objectives of the Plan

Fuel Mitigation:

- To identify and categorize wildfire fuels and the prioritization of those fuels for mitigation across the landscape.
- Treat fuels in a manner consistent with restoring forest health and improving the currently decadent wildlife habitat.

Emergency Response:

- To detail wildfire response, community preparedness and infrastructure protection.
- To outline professional and community volunteer communication linkages and response to widespread wildfire emergencies.
- To detail traffic egress/ingress for emergency residential evacuations and emergency equipment and professional services entry.
- To recommend water supplies for future construction/installation.
- To delineate community and public communication and information systems' usage for and during emergency events.

Private, State and Federal Assistance:

- To influence where and how private, and county agencies implement fuel reduction by proposing alternative locations and methods for treatment on lands in the CWPP zones.
- To assist in the acquisition of private, local, state and federal funds for the HVPOA for wildfire hazard(s) mitigation and response related projects.

Administration and Plan Maintenance:

- Define implementation plans, schedules and monitoring.
- Set forth on-going plan maintenance and plan updating strategies.

Plan Components

The HVCWPP provides four primary sections plus reference information. Geographical and ecological background along with forest management and wildfire history is detailed in Chapter 3. Chapters 4, 5 and 6 cover, respectively, hazards assessment, ingress/egress, and the resources for addressing wildfires. Chapter 7 identifies communication and information support for the residents in and around the HVPOA in the event of a wildfire emergency. Finally, Chapter 8 is the implementation plan of the

Community Wildfire Protection Plan, detailing public education, fuel treatment - mitigation priority, timeline and funding methods, and support systems additions and funding.

A wide variety of conservation, property mitigation, vegetation and services reference material can be found in the appendices of this document.

Maintenance of the Plan

The overall goal of maintaining the HVCWPP is accomplished through annually monitoring plan-effectiveness and by adjusting the plan to account for current changes in wildfire hazard conditions, response capabilities, technologies and ancillary circumstances. The HVCWPP is meant to be a "*living document*" which is updated periodically to assure consistency in both wildfire prevention and planned response to wildfire situations both in POA's wildland/urban interface areas and outside the community.

Each year, at least three months prior to the Annual meeting of the memberships, the board may formally request its Environmental/ACC committee to conduct a CWPP performance review to include both an overall plan evaluation of the CWPP for the past wildfire season as well as any proposed changes to the CWPP for the following year. This schedule may be adjusted to allow conformance with the HVPOA's budget cycle. The overall evaluation and recommended changes to the CWPP will be presented and addressed at the Annual membership meeting. Changes will be formally incorporated into the CWPP and furnished to all stakeholders by January of the following year. These changes should also be reflected in the POA budgets for the following year.

Between the aforementioned Environmental/ACC Committee meeting and the formal updating of the CWPP each year, the HVPOA board or its representative(s) will meet with key stakeholders representing primary professional forest management (CSFS), fire prevention, emergency management, and other relevant stakeholders to review proposed CWPP changes and updates. Once the HVPOA board and the key stakeholders are in agreement to the proposed changes and updates to the HVCWPP, those changes and updates will be available for public perusal and comment; either at a pre-announced public meeting or through the HVPOA website at www.hiddenvillageco.com.

Formal CWPP evaluation will be done in conjunction with SMFRA personnel. A sample "Evaluation and Monitoring Worksheet" is attached as **Appendix D** and addresses the following issues:

1) *Implementation*: Will track the CWPP project(s) as laid-out for the year and assess the success level of execution;
2) *Execution of project:* What issues occurred that either aided or impeded the project?
3) *Maintenance Needs Monitoring*: Evaluates, determines and prioritizes areas that have been treated in the past, but are in need of maintenance treatments to maintain effectiveness as originally intended.

Upon completion of the evaluation, a copy should be sent to the CSFS Franktown District office. Lessons learned from monitoring and data collection will be useful for modifying project plans to better meet HVCWPP goals and objectives.

BACKGROUND AND HISTORY

Geographic and Ecological Location

Hidden Village is an 850 acre community located along the southeastern boundary of the Town of Parker. The community abuts Hilltop Road along its northern boundary. (See Figure 1, Vicinity Map). Located approximately 28 miles from downtown Denver to the northeast, Hidden Village's major residential development started in 1966. Full build-out of Hidden Village has the potential of 150 homes.

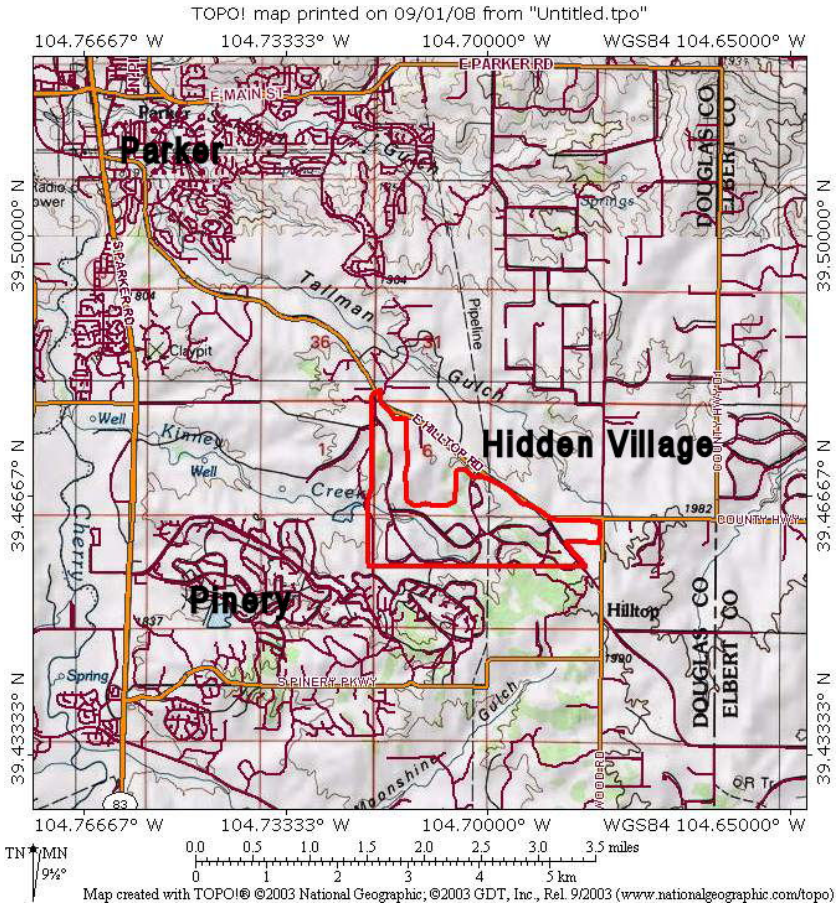


Figure 1. Vicinity Map

Hidden Village is a classic wildland urban interface community abutting high density residential communities, and large lot holdings. To the east, Hidden Village slopes upward to high elevation prairie terrain of 6,500 feet above sea level. To the southwest, the community's lowest elevation is 6,220. Average elevation is approximately 6,350 feet, varying greatly from gentle zero to twenty percent slopes. Limited areas range from 20-35 percent. All areas are considered accessible by forestry equipment. Vegetation consists of dense stands of Gambel oak, three-leaf sumac, mountain mahogany, ponderosa pine and prairie grasses.

The area within the boundaries of Hidden Village is predominantly historic timber and grazing lands as part of early ranching and logging in the region. The area was first visited by the Stephen Long expedition in 1820. Heavy usage is evident given the presence of old ranch trails and logging stumps. The fire regime for the area historically created a diverse mosaic of plant

communities that may have burned on a ten to fifty year cycle. Evidence of this mosaic can be seen in historic 1800's photos of the area (See Figure 2). Wildfires have been suppressed over the past 100 years. The Hidden Village community, created in the late 1960's, has grown steadily with significant in-fill growth taking place over the last ten years.

Figure 2, 1871 Photo showing fire pruned pines in present-day Douglas County near the Palmer Divide (W. H. Jackson, USGS)

History of Hidden Village (From the files of Hidden Village Historian Sharon Boogie)

In 1966 Hidden Village was in the beginning stages of development, one of the first rural residential subdivisions planned in Douglas County.

The founder/developers, C.G. Taylor, D.W. Hamilton and R.L. Crowther designed Hidden Village to accommodate those who wished to own, enjoy and keep horses on their property. Therefore, several miles of bridle trails were designated as 20 foot easements throughout Filings 1-4 to assure that each lot in these filings had direct access to the trail system. To insure that all residents would benefit by the unique environment, covenants, guidelines and by-laws were adopted to preserve and enhance the lifestyle which has made this subdivision one of the most sought after areas in real estate.

Protective covenants for Filings 1, 2, and 3, with Filing 4 amending to them were recorded in Douglas County 29 April 1966. Filing 5 covenants were recorded 9 March 1971 and Filing 6 recorded 9 December 1977. (See Figure 3, Map and Directory)

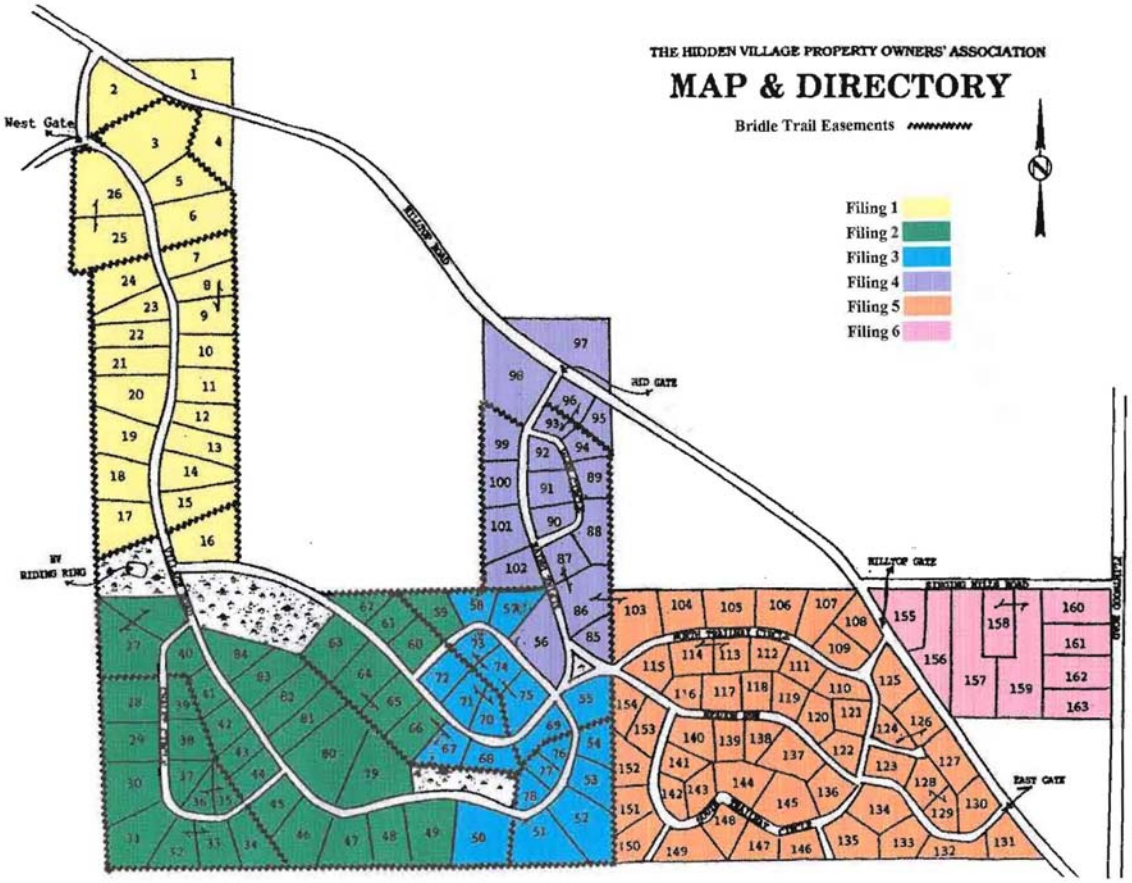


Figure 3, Map and Directory of all Hidden Village Filings

It is obvious that great care was taken by the developers and early settlers to preserve the environment and lifestyle of Hidden Village. The Board of Directors, acting as the Environmental & Architectural Control Committees, is dedicated to protect the interests of all homeowners by properly and fairly enforcing the covenants following guidelines that have been beneficial to all residents.

The goals of the committees are:

1) To insure compliance with the protective covenants
2) To ascertain compliance of plans and specifications with Douglas County and other governmental requirements
3) To maintain and enhance view, trees, natural vegetation, serenity, architectural quality and rural atmosphere in Hidden Village

To encourage planning that will provide the greatest protection for environment and neighbors such as the impact of noise, traffic, dust, weeds, odor and exterior apparatus impacts such as placement of satellite dishes, antennas, lighting etc.

It is imperative that all plans and specifications for landscape, buildings, additions, and fencing be submitted to the Board for approval.

The Fire mitigation committee, part of the Environmental Committee was formed in 2005 to assist the board of directors in making the community more fire resistant. A number of large, landscape scale fires had occurred in the mountains since 1996 increasing the awareness of wildfire risks to Hidden Village. The area is very prone to lightning caused fires.

HVPOA has worked closely with SMFRA to increase awareness. Several fuel treatment projects were spearheaded by members of the Department with primary focus on improving safety along community roadways. The HVPOA recently began budgeting funds annually for fire mitigation. In 2008, the HVPOA budgeted funds to develop its Community Wildfire Protection Plan (CWPP). A professional forester was engaged to complete the plan by September 2008.

Transportation planning has been an on-going function of the HVPOA. All access points within the community connect to Hilltop Road. All roads within the community are operated and maintained by Douglas County Public Works. Roadway surfaces are currently gravel all-weather surfaces. Dust abatement is done regularly. Road widths are sufficient to allow two full lanes of travel. Road side ditches line all roadways and are mowed annually by Douglas County.

All properties in Hidden Village utilize individual wells and septic systems. No central water supply currently exists. Neighboring communities (The Pinery, Tallman, Colorado Golf) have fire hydrants well within water shuttling range of Hidden Village. Overhead power lines, operated by Intermountain Rural Electric Association, provide power to homes.

Wildfire History

Over the past four decades, Hidden Village has avoided major wildfires. Small lightning and human caused fires have been typically suppressed quickly. Evidence was found in the community in the form of fire scarred logging stumps. It is estimated low intensity ground fires burned through the area with return intervals ranging from every 10 to 25 years. The remaining "stump record" indicates that pre-European ponderosa stands consisted of large, well spaced trees, pruned up by regular fires. The existing forest is considered a "second growth" forest impacted by 100 years of wildfire suppression. This has resulted in stands of dense ponderosa pines prone to greater risk of high intensity crown fires.

Wildland Urban Interface (WUI) Impact Areas

With the high potential of ground lightning ignition and recreation/residential related fire starts, the forest and homes in Hidden Village are at increased risk of loss by wildfires. It should be remembered that wildfires can also spread from the community into the surrounding areas.

The Wildland Urban Interface (WUI) for Hidden Village was set after meeting with local fire officials. Two Zones were established to allow prioritization of treatment areas that may impact the community. These are shown on Figure 4. WUI Zones. These units were set to aid local, county and municipal agencies in targeting planning and funding for areas within one-half mile of wildland interface communities like Hidden Village.

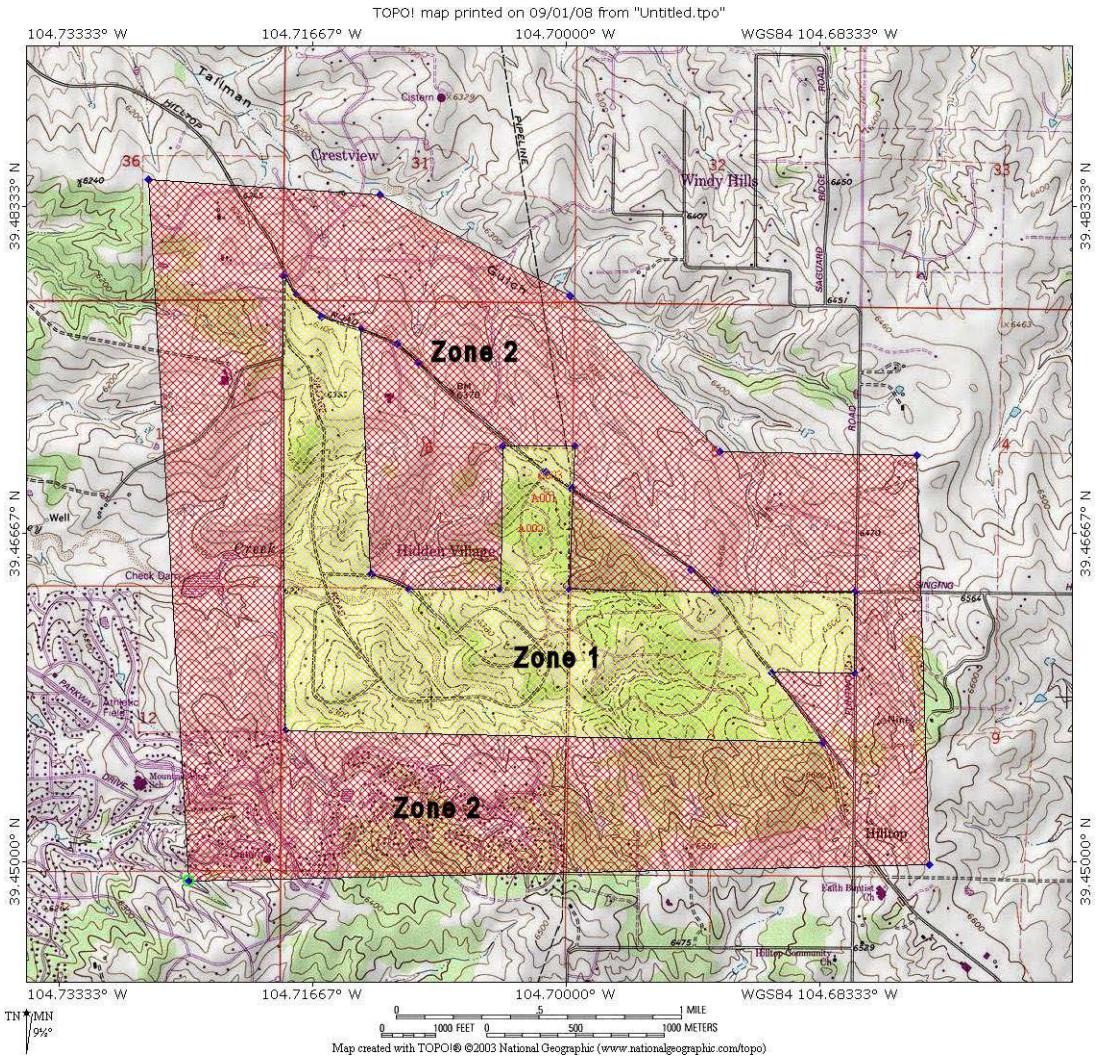


Figure 4. Hidden Village WUI Zones

Zone 1

Zone 1 is Hidden Village shown in Figure 5. It consists of the community and is approximately 850 acres in size. The HVPOA owns approximately 20 acres as common area and right-of-ways.

Fuel treatment projects have been on-going on private lots since 2002 with a primary focus on treating ladder fuels. Members of the Environmental Committee coordinated chipping services. This was paid for through individual homeowner payments to the chipping service. Fuel treatments, in the form of tree thinning along the South Trailway right-of-way, were initiated in 2005 through a joint effort with SMFRA firefighters and abutting landowners.

Homeowners and property owners have been encouraged to implement Firewise guidelines around all structures through educational efforts of the HVPOA, SMFRA and Colorado State Forest Service.

In the past, removal of trees and vegetation was strictly controlled by the Architectural Control Committee under the HVPOA Covenants, Conditions and Restrictions (CC&R's) and Design Guidelines. A procedure was developed as part of the CWPP process to allow individual property owners to mitigate their fire risks. Owners may be required to obtain an inspection from a fire

professional and the fire department as part of their mitigation efforts. Senate Bill 100, passed in 2005 by the Colorado State Legislature, now allows for homeowner mitigation in communities that previously prohibited cutting of trees. Called SB-100, it is attached as Appendix B.

Douglas County Building Department provides wildfire mitigation oversight for new construction using the Douglas County Wildfire Mitigation Standards as a guideline. More specific wildfire mitigation planning for Zone 1 is covered in Chapter 4.

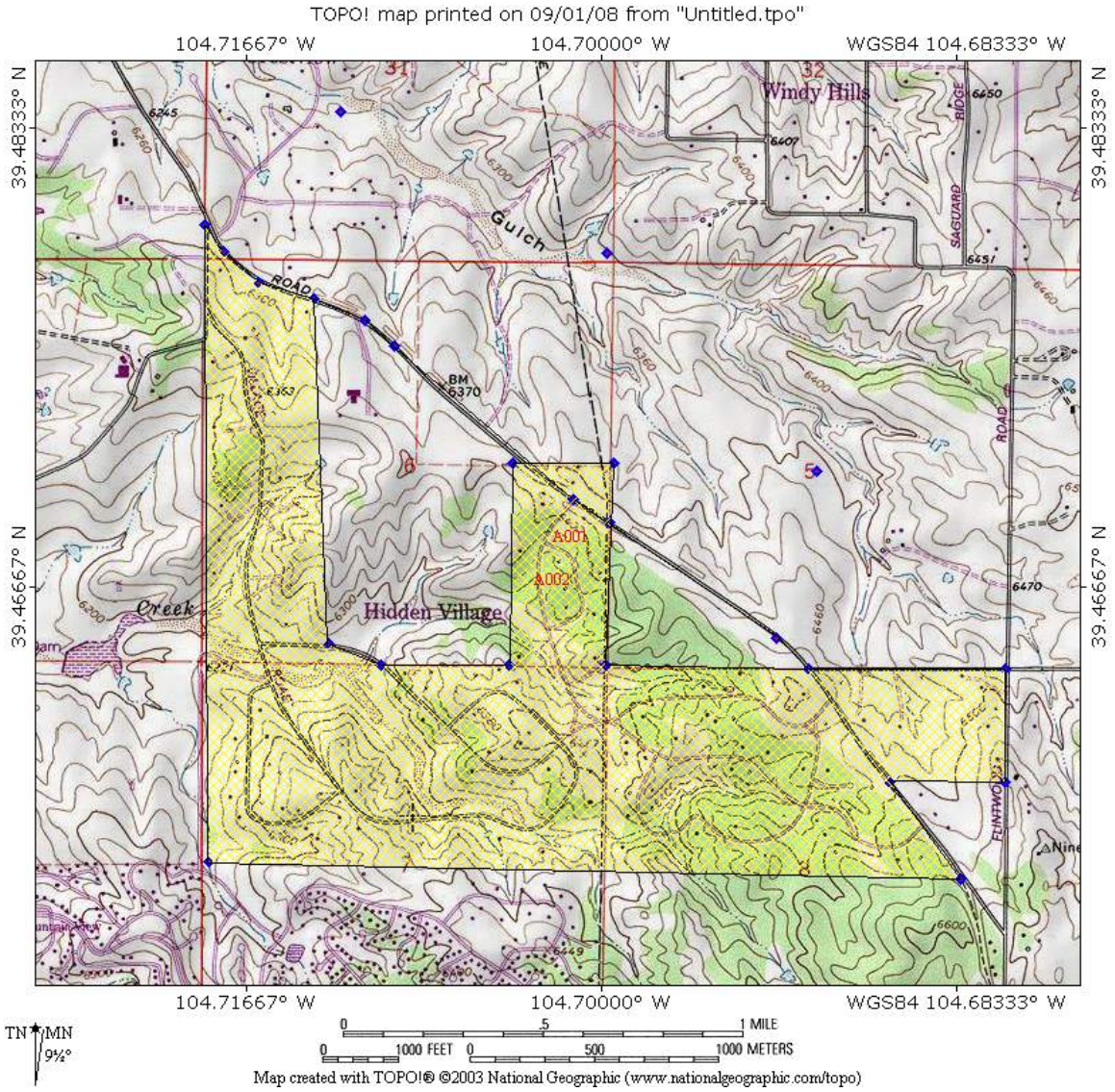


Figure 5 Hidden Village, Zone 1

Open Space parcels both within and abutting the community are shown in Figure 6. These are predominantly grassland areas. Two parcels (No. 1 and 4, 16.72 acres m/l) are owned by HVPOA. Two parcels (No. 2 and 3, 11.47 acres m/l) are owned by Douglas County. Parcel 6 (41.22 acres) is owned by Reata Metropolitan District. Douglas County Open Space staff is working closely with HVPOA to increase weed control efforts on Douglas County controlled property. The Reata parcel is currently used for passive recreation with a trail that runs north to south along its western boundary. Opportunities may arise in the future for joint projects that benefit HVPOA and Reata property owners.

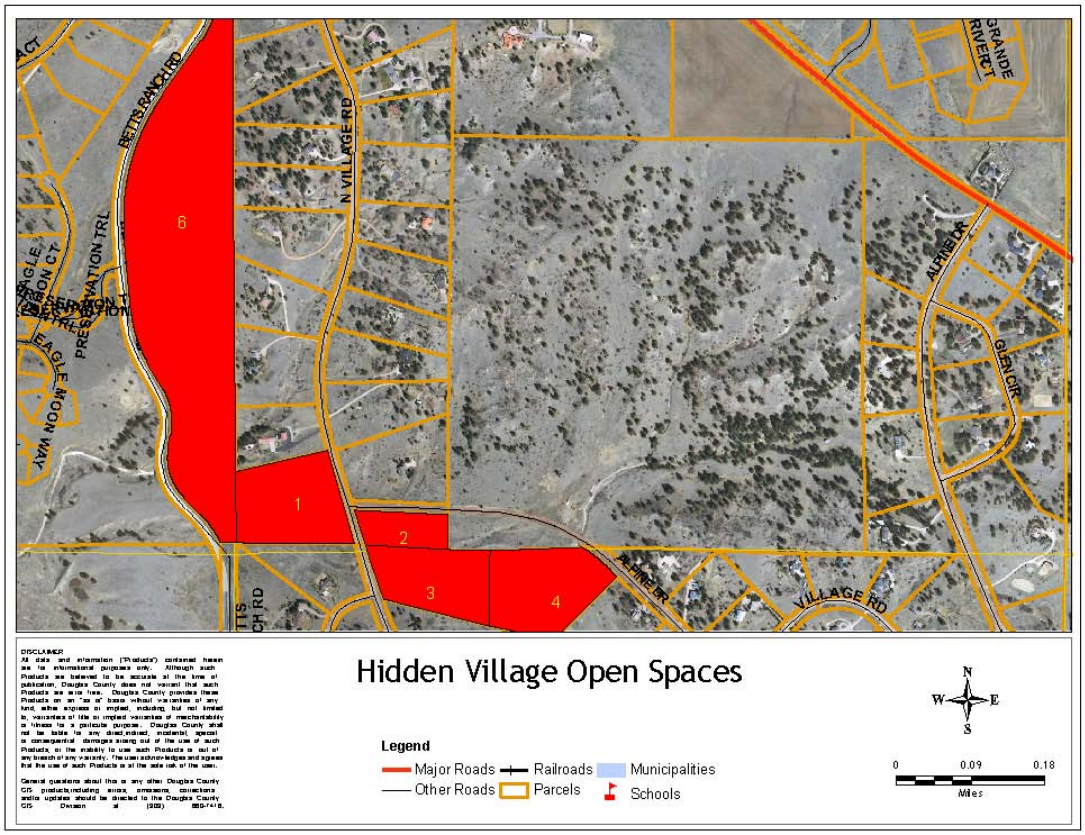


Figure 6, Hidden Village Open Spaces

Zone 2

Zone 2 is the adjoining Wildland Urban Interface. This zone is approximately ½ mile wide. The major owners within this zone are private owners. The area surrounded by Hidden Village Filings 1-4 is referred to as the "Whittlesey Property" and is currently proposed for subdivision into four 40 acre parcels. New construction will follow Douglas County Wildfire Mitigation Regulations. If the property is subdivided into parcels smaller than 35 acres, it will fall under Section 17 of the Douglas County Zoning Ordance with a higher level of wildfire mitigation requirements.

The Bennett property located along the southeast community boundary is not currently managed for wildfire hazard reduction. It is recommended that contacts be made with the owner to develop joint projects that will benefit both Hidden Village residents and the Bennetts.

A portion of the Pinery abuts Hidden Village along the southwest community boundary. These are ¼ to ½ half acre lots. Tree preservation has been stressed throughout the Pinery's development. Encouragement of fire mitigation efforts on these smaller lots will be an on-going issue.

The Reata Metropolitan District parcel, located between Betts Ranch Road and the west community boundary, offers a good opportunity for cooperative efforts to protect forests and homes.

Zone Totals

The estimated entire area covered by this CWPP can be summarized as follows:

Zone 1- 850 acres
Zone 2- 2,650 acres

Total acres = 3,500 acres

Note: All Zone boundaries and acreages are approximate and are intended as a guide only.

WILDFIRE HAZARD ASSESSMENT

This section of the Community Wildfire Protection Plan addresses the identification and the prioritization of fuel mitigation treatments for high risk wildfire hazards impacting Hidden Village neighborhoods as well as a brief assessment of vegetation fuels currently within the proposed fuel treatment areas. The wildfire hazard areas identify both developed areas in the neighborhoods and those areas immediately outside of the HVCWPP boundaries in the Wildland Urban Interface areas described in Chapter 3, *Background and History*.

Methodology and Strategies

Wildfire behavior in Hidden Village will be affected by fuel, weather and topography. No attempt was made to use fuel modeling for determining fire behavior for any one event. Instead, all areas will be treated as if fire can start at any point in or around the community and be affected by an infinite number of probabilities. Wildfire is capable of coming from any direction. Therefore, every home and all fuel treatment areas should be treated to allow for an inevitable fire that will burn at a rate and intensity more consistent with past historic levels.

The community has been divided into eleven stands that will serve as compartments for specific treatments intended to prevent wildfire spread from one compartment into another, or to contain fire to the affected compartment. Treatments are spelled out in Chapter 8. Each compartment has a similar fuel type. Areas within each compartment will also be prioritized for treatment in Chapter 8 and Appendix A.

Fire fighting strategies often must rely on the use of fire by fire fighters to protect structures. Terms like “black lining”, burning out, and “backfiring” are becoming more familiar to wildland residents as media coverage increases. The recent Green Mountain Fire (August 2008) demonstrated how fire was a critical tool for protecting homes. The long range goal of the community should be to treat all forest and brush areas so that use of fire is a viable fire fighting tool.

Four main “fuel types” are found within Hidden Village. Fuel models for WUI residents are often complicated and confusing. It is recommended these be simplified to “Low”, “Moderate” and “Severe” Hazards to aid the average homeowner in assessing his/her risk. These are summarized as follows:

Fuel Types-

1. Grasslands, native prairie- Low Hazard (NFDRS Type A/L, FBO Type 1) Typically **light**, flashy fuels with scattered yucca, three-leaf sumac and noxious weeds. Occasional scattered ponderosa pines are present. See Figure 7.
    a. Anticipated Fire Behavior- Flames <= 5’ high, higher flare-ups rare; duration of flame lengths brief; fire spread slow to fast, 1-40 acres/hr; humans can usually run through flames without serious injury and can occupy just-burned areas; spotting generally rare short range. Steep topography will affect rate of spread.

Figure 7, Hidden Village Grasslands, Native Prairie

2. Open Pine with grasses- Medium Hazard (NFDRS Type C/T, FBO Type 2) Typically scattered ponderosa pines with grass and light brush understory. **Moderate** understory fuels may be present that contribute to small areas of crowning. See Figure 8.
    a. Anticipated Fire Behavior- Intermittent flare-ups occurring up to many feet above tree tops; short and medium range spotting common; behavior between flare-ups as in Grasslands; passing through fire front sometimes possible but chancy; parts of burned area can be occupied within half hour.

Figure 8, Hidden Village Open Pine With Grasses

3. Mature Brush- Severe Hazard (NFDRS Type B/O, FBO Type 4) Areas with **heavy** brush (gambel oak, three-leaf sumac and mountain mahogany) and scattered ponderosa pines. Brush affected by frost and drought kill. See Figure 9.
    a. Anticipated Fire Behavior; Flames 5-20' high of brief duration; high rate spreads, at least 40 acres per hour; humans cannot safely pass through flames but can occupy burn area within about 15 minutes; short range spotting from blown embers common.

Figure 9, Hidden Village Mature Brush

4. Heavy timber- Severe Hazard (NFDRS Type E/P/U, FBO Type 9) Areas with **heavy**, dense and clumpy stands of ponderosa pine. Overtopped and suppressed trees contribute to ladder fuels. Crown fire potential is high. See Figure 10.
    a. Anticipated Fire Behavior- Flare-ups higher than tree tops frequent to continuous; spread rates of up to several hundred acres per hour possible; fire front impassable; spotting several hundred yards common, possibly up to 1 mile or more; just-burned areas untenable for >= an hour.

Figure 10, Hidden Village Heavy Timber

A fuel map tied to stand and compartment numbering is shown in Figure 11.

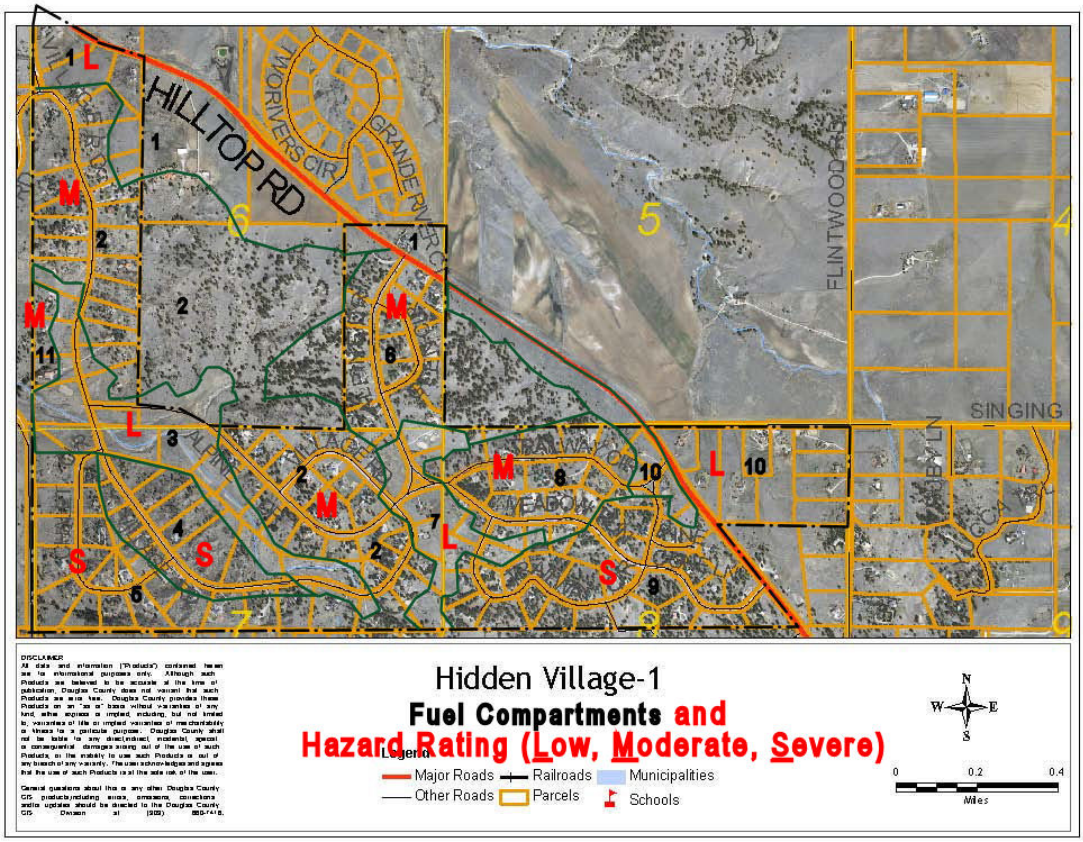


Figure 11, Stand and Hazard Rating Map

Compartment/Stand descriptions are summarized in the following table:

Compartment Number	Acres	Fuel Type NFDRS	Fuel Type FBO	Low= L Medium= M Severe= S	Description
1	48.8	A, B, L, T	1	L	S to SW aspect. Meadows and pasture with scattered brush and pines. Slopes 5-20%.
2	183.0	C, E, R, T	2	M	S to SW aspect. Widely spaced trees and tree clumps. Scattered brush. Slopes 10-35%.
3	81.0	A, B, L, T	1	L	W and S to SW aspect. Meadows. Slopes 5-15%.
4	58.3	B, E, O, R	4	S	W and S to SW aspect. Scattered pines with heavy brush. Slopes 10-35%.
5	93.6	B, E, O, R	4	S	S to SW aspect. Scattered pines with heavy brush. Slopes 10-35%.
6	67.0	C, E, R, T	2, 4	M	S to SW aspect. Widely spaced trees and tree clumps. Scattered brush. Slopes 5-25%.
7	45.0	A, B, L, T	1	L	S to SW aspect. Meadow with scattered trees and brush clumps. Slopes 5-15%.
8	67.0	C, E, R, T	2, 4	M	S to SW aspect. Widely spaced trees and tree clumps. Scattered brush. Slopes 10-35%.
9	118.0	E, P, U	2, 8	S	W aspect. Heavy timber with scattered brush. Slopes 10-35%
10	78.6	A, L	1	L	NW aspect. Meadows and pasture. Slopes 5-15%.
11	9.7	C, E, R, T	2, 4	M	S to SW aspect. Widely spaced trees and tree clumps. Scattered brush. Slopes 5-30%.
Total	850.0				

Table 1, Compartment/Stand Fuel Type Descriptions.

Topography and Fire Behavior

The community is generally oriented to the southwest. Slopes range from gentle meadow slopes of 5-8% to steeper areas of 20-35% with heavy timber. Rate of spread will be increased on steeper areas of the community. The terrain is made up of numerous draws, ravines and small saddles. These will impact fire behavior by increasing wind speeds.

It is estimated that over 80% of the community is accessible by all wheel drive vehicles and equipment for fire suppression and fire prevention activities. A more thorough introduction to wildfire behavior and topography is found in the CSFS publication “Shaded Fuel Breaks for Rural Subdivisions and Mountain Communities (Appendix E).

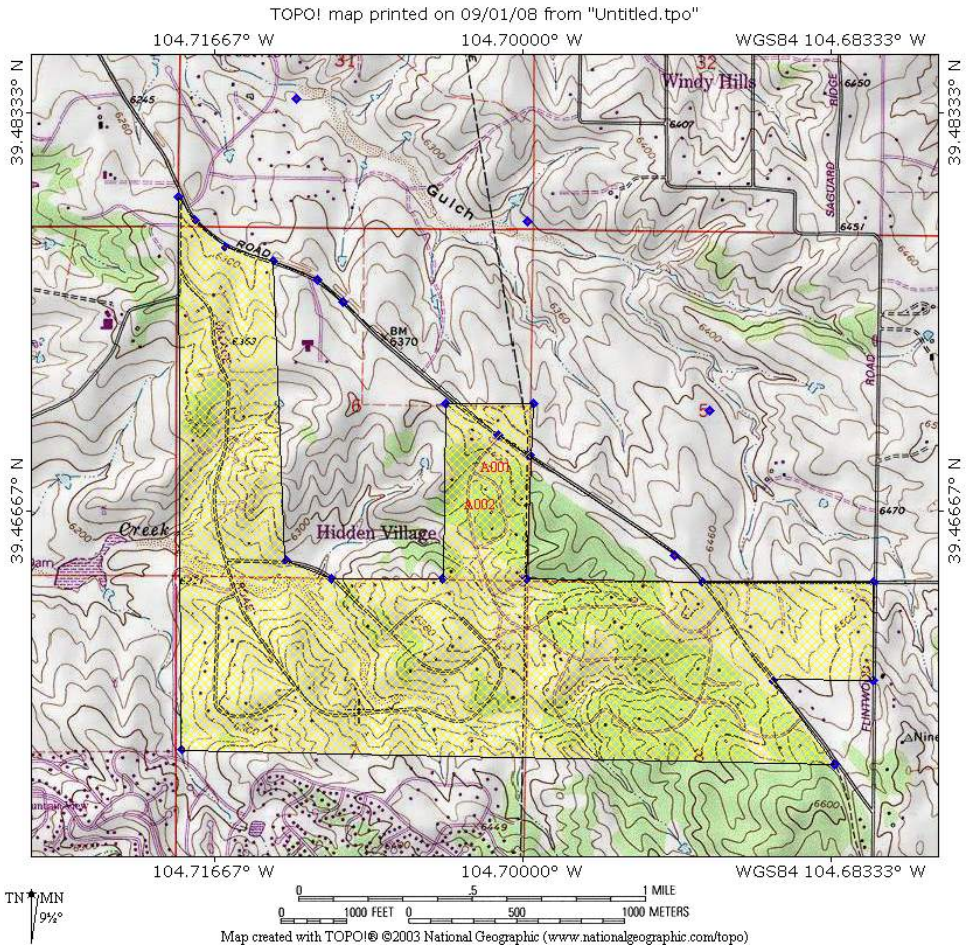


Figure 12, Hidden Village Topography

Weather and Fire Behavior

The Hidden Village area is often affected by high winds from the west associated with frontal passages. Upslope weather patterns occasionally generate winds out of the south and southeast. Gusty winds typically accompany thunderstorms which produce dry lightning. These gusty winds accelerate the spread of fires. Thunderstorm winds tend to be erratic in direction and speed posing one of the greatest dangers for firefighters.

Hidden Village is located in the northern portion of the highest lightning strike zone (Cloud to Ground Strikes) in Colorado. This zone extends from the Pikes Peak Region to the northern edge of the Palmer Divide in northern Douglas County. About half of all forest fires in Colorado are ignited by lightning (source: NOAA).

Structural Ignitability

SMFRA has begun home assessments for all homes in the Fire Authority's jurisdiction. Hidden Village will be prioritized because of community interest. A number of homes in HVPOA have wood shake roofs (approximately 25%). Homeowners should be encouraged to change these to a Class A roofing material less prone to ignition. These homes will also pose a threat to neighboring homes. Fire brands, or embers, can easily ignite shake roofs well away from a wildfire front. Currently, there are no incentives to encourage shake roof owners to change, other

than increased insurance costs. It may be possible that in the future, homeowner insurance will be difficult to obtain for shake roofs due to fire and hail exposure. There are currently no restrictions by the HVPOA requiring shake replacement should a homeowner decide to change out a shake roof to a more fire and hail resistant material.

It is estimated that as many as 50% of Hidden Village homeowners have implemented some level of wildfire mitigation. However, none should be considered fully Firewise at this time. In some cases simple mowing provides an initial level of treatment. All homeowners, even those well away from native vegetation, should learn measures to protect their homes from fire brands (see Appendix C for recommended standard). Fire brands can be lofted high into the air and carried up to a mile, placing all homes in the community at risk. Prevention measures can be as simple as regular mowing of high grasses or by periodic irrigation. Landscaping, using Firewise plants (CSU Extension Publication 6.305 and available at www.csfs.colostate.edu), is recommended in all areas. Junipers and other flammable vegetation are readily ignited by fire brands lofted into the neighborhood.

Susceptibility to wildfire for all homes is the responsibility of each homeowner. Efforts must be focused on educating owners of their risk.

Emergency Egress and Staging Areas

Multiple ingress and egress points are critical to public safety. Egress is needed for residents to evacuate and ingress required for emergency services. The need for multiple egress points in insuring adequate and timely evacuations has been shown in research studies by Professor Thomas Cova at the University of Utah. His team's research has shown that a minimum of four egress points are needed for a community the size of Hidden Village. (*Public Safety in the Urban-Wildland Interface: Should Fire-prone Communities Have a Maximum Occupancy?* Thomas J. Cova, Natural Hazards Review, August, 2005). It is also important to note that "bottlenecks" may occur within the community if all traffic is directed to only one entrance.

A recent quote by Jack Cohen, Fire Scientist with the USDA Forest Service noted that, "Long evacuation routes are NO evacuation routes." (Personal quote made at the 2006 National Wildland/Urban Interface Fire Education Conference, 11-4-06, Denver, Co.)

It is recognized nationally, that most civilian fatalities occur during wildfire evacuations. This is also confirmed by studies of wildfire evacuation fatalities in Australia (*The Complete Australian Bushfire Book*, Joan Webster, 1986, revised 2000). Residents either become trapped by a fast moving fire, or wait too long to evacuate. It is recognized that if smoke and flames are already present, it may already be too late to evacuate. It can be expected that residents attempting to leave the community will clog existing roadways and impede access by emergency service providers.

Egress Routes

Four main routes lead out of the neighborhood. These are North Village Road, Alpine Drive, North Trailway Circle, and East Meadow Run. It is often taken for granted that Douglas County Sheriff's Deputies will be available to direct residents in the right direction for safe evacuation. This may not necessarily be the case. Evacuation orders typically provide a route and destination to residents. However, it should be noted that individuals tend to use the route they use routinely and do not always become familiar with other routes. All routes are shown in Figure 13.

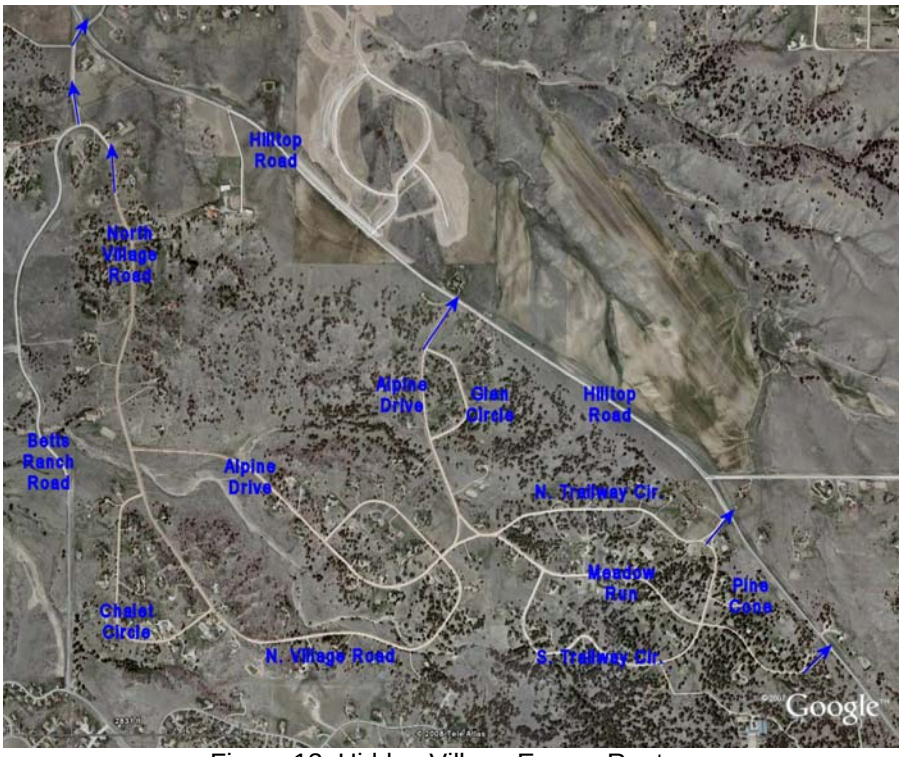


Figure 13, Hidden Village Egress Routes

These routes are analyzed as follows:

1. North Village Road, E-1 (see Figure 14)- This roadway winds through the west portion of Hidden Village and connects to Betts Ranch Road leading to Hilltop Road. It is also connected to Alpine Drive at two locations. It is of sufficient width to allow for two full lanes of travel, with parking along each side. Sight distances at all interior intersections appear to be adequate. All are properly posted with metal street name signage and cross-street movements controlled by stop signs. Direction of evacuation will be incident dependent. However, it has limited sight distances at the crests of hills. Sections of N. Village Road that have heavier fuels along its route have been listed as “priority 1” for fuel treatments in Appendix A.

Figure 14, North Village Road, E-1

2. Alpine Drive, E-3 (see Figure 14, above)- This roadway begins at Hilltop Road and winds through the middle portion of the community. It connects to N. Village Road and North Trailway Circle. It has one area of concern, this being fuels along two sections (between each connection to N. Village Road, and from N. Trailway Circle to North Glen Circle. This is listed as a "priority 1" treatment area in Appendix A. Street signage and intersection sight distances are adequate at all intersections. Again, direction of travel during a wildfire event will be incident dependent.

3. North Trailway Circle, E-4 (see Figure 15)- This roadway begins at Hilltop Road and terminates at Alpine Drive. It is a full width street with limited parking on either side. Most of its length is through heavy fuels and roadside ditches with dense stands of pine regeneration. This will also be a "priority 1" treatment area in Appendix A.

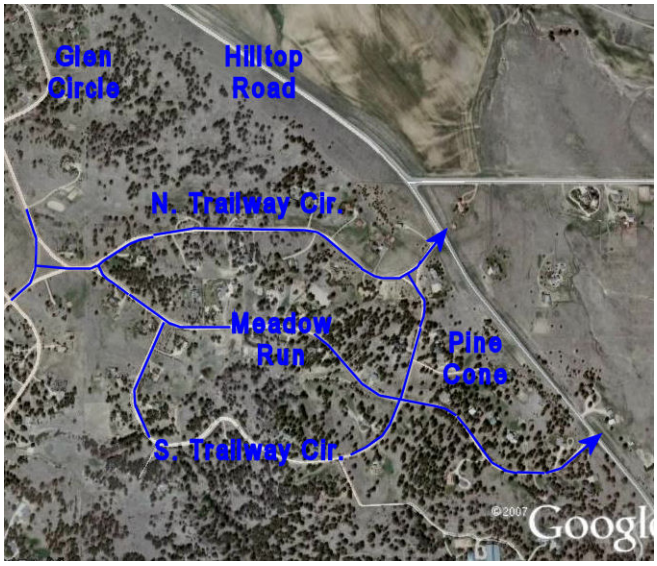


Figure 15, North Trailway Circle, E-4

4. East Meadow Run, E-5 (see Figure 15, above)- This roadway begins at Hilltop Road and terminates at North Trailway Circle. Initial fuel treatments were done several years ago to reduce fuel loading and should be completed at a priority 1 area for fuel treatments. Dense pockets of pine regeneration are found along road side ditches and will present a hazard during wildfire events.

Other secondary roads within the community will exit via any one of the egress points noted above. A summary of these streets and their expected egresses is as follows:

Chalet Circle- Each end of Chalet Circle empties onto North Village Road. Direction of travel will be event driven. Fuel treatment along this street should focus on brush hanging into the right-of-way and seasonal mowing.

South Trailway Circle- This street begins on the west end of Meadow Run, crosses Meadow Run to the east and terminates at North Trailway Circle. Direction of emergency travel will typically be to either Meadow Run or North Trailway Circle. Alpine could also be used if either of the two above are cut off by wildfire. Extensive fuel treatment is needed along S. Trailway to remove or heavily thin groups of saplings and pole size trees located in the right-of-way. Initial treatments were done several years ago and should be resumed.

Glen Circle- Glen Circle exists at both ends onto Alpine Drive. It is anticipated this will be the primary emergency exit. Thinning of dense pockets of pines should be done.

Pine Cone Lane- This cul-de-sac can exit to either N. Trailway or Meadow Run, depending on the direction of fire travel. Minimal fuel treatment is needed.

Singing Hills Road- All will access onto Singing Hills Road to either Flintwood Road or Hilltop Road.

Optional Ingress Routes

Two other potential ingress/egress routes are suggested for further study for emergency use. The first is a possible connection to Betts Ranch Road through the Hidden Village open space and Reata Metropolitan District space adjacent to the horse corral (E-2). An on-grade option exists. However, private property may need to be crossed to make the connection to North Village Road. However, development of the route or its use will require cooperation with Douglas County and other stakeholders. The second possible route is through the Bennett property to the south with a connection to South Trailway Circle (E-6). Access currently exists by all weather surfaces with connection possible to Democrat Road.

The following is a list of recommendations for improving ingress/egress from the community (not in order of priority):

1. Consider paving all roadways to Douglas County standards. It was pointed out by SMFRA officials that emergency response times would be improved with paved surfaces.
2. With the current gravel roads, regular maintenance by the Douglas County Public Works Operations Department is important in keeping the roads in the best shape. The current gravel surface is known to be slick when wet and can be subject to “wash-boarding” and rutting. Regular dust suppressant treatment can result in slippery roads when wet.
3. Monitor all intersection sight distances annually to remove trees and brush that prevent clear lines of sight that may be critical during evacuation; especially at night or under smoky conditions.
4. Develop a home addressing program that could improve response times for medical emergencies. Letters should be on metal surfaces, with metal posts. Numbering should be at least six inches tall and made of reflective material that will be visible at night or under heavy smoke conditions.

5. Provide clear signage for all "Y" intersections to avoid confusion by responding fire fighting resources that may not be familiar with the area. These are the Alpine/N. Trailway, Meadow Run/N. Trailway and the North/South Trailway intersections.
6. Mow all roadways a minimum of once per year. All owners should be encouraged to mow all road frontages with a maintained grass height of less than six inches.
7. Utilize the Hidden Village Riding Club plan for evacuation of large animals, in conjunction with organizations such as the Douglas-Elbert County Horse Council (DECHC).

Civilian Staging Areas

Areas within Hidden Village were identified as Civilian Staging areas that could be used by residents in the event usual evacuation routes become clogged with traffic or threatened by wildfire. The first choice is to not use Civilian Staging Areas. However, should conditions warrant, these may have the potential to reduce risk of entrapment. These are in areas with low fuel volumes, typically grasses. In most cases they are already mowed annually. The map in Figure 16 shows six possible staging areas.

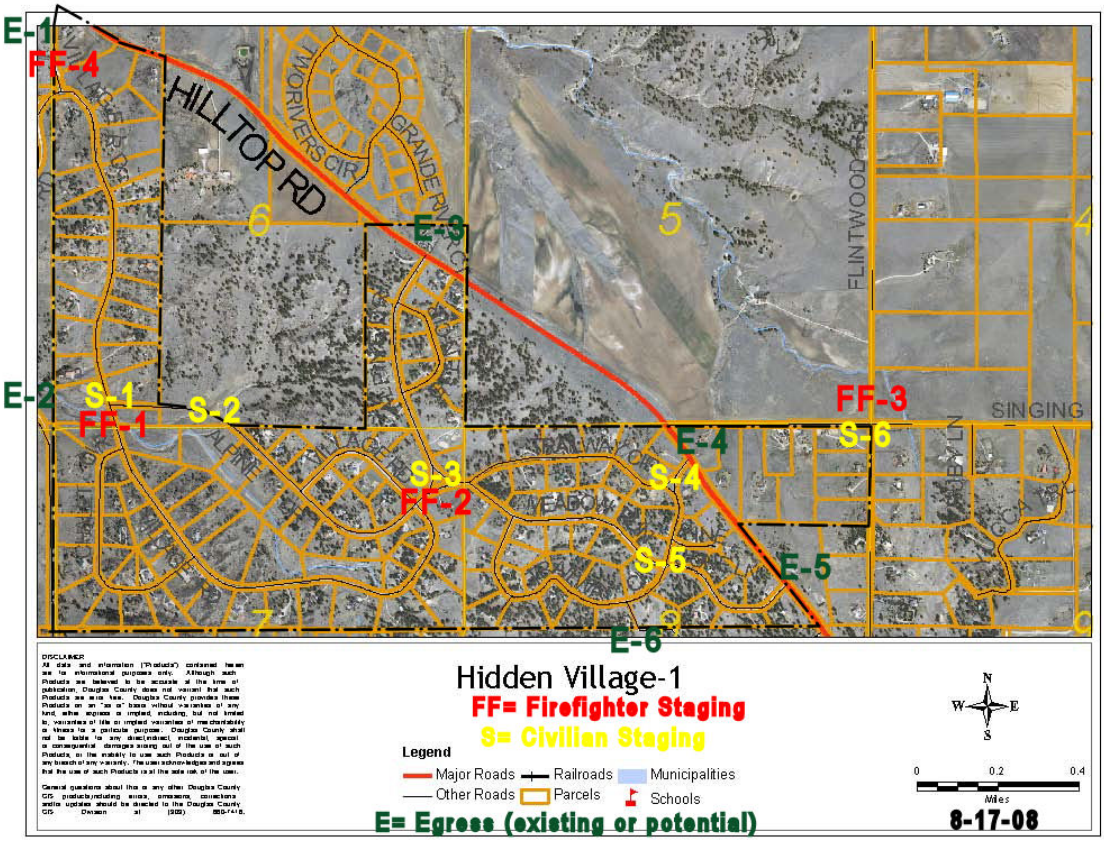


Figure 16, Staging areas

It should be noted civilian staging areas will be "event driven" and may not be suitable for all wildfire events. However, the intent is that residents will be directed by emergency personnel to the safest route from the community or staged to allow ingress of fire suppression resources.

Civilian Staging areas are located at:

- S-1, Intersection of North Village Road and Alpine Drive.
- S-2, Alpine Drive at the Whittlesy property.

- S-3, Intersection of Alpine Drive and North Trailway Circle.
- S-4, Intersection of South Trailway and North Trailway Circles
- S-5, Intersection of East Meadow Run and South Trailway Circle.
- S-6, Intersection of Singing Hills Road and Flintwood Road.

The civilian staging areas may also serve as fire fighter safety zones. All are in areas with light fuels that could be "burned out" to allow fire fighters to remain in the community. (Note: NWCG Safety Zone Guidelines and LCES standards should be followed. See Appendix F)

Fire Fighter Staging Areas

Four sites were identified as being suitable for staging of fire fighting resources. All are accessed by all-weather surfaces, have good turn-around areas, and will allow water tender operations.

Fire Fighter Staging areas are shown in Figure 16, and located at:

- FF-1, Intersection of North Village Road and Alpine Drive.
- FF-2, Intersection of Alpine Drive and North Trailway Circle.
- FF-3, Intersection of Singing Hills Road and Flintwood Road.
- FF-4, Intersection of North Village Road and Betts Ranch Road.

Caution should be observed if any of the sites noted above are considered for use as a helicopter base of operations. Overhead power lines are common in the subdivision and adjacent area.

Shelter In Place (SIP)

Limited access and sub-standard egress routes in heavy fuel areas may force homeowners to consider shelter-in-place (SIP) as their only alternative during a major wildfire event. Shelter in place is a last resort. All residents should make plans to evacuate immediately when advised by emergency services personnel to do so. However, in the event homeowners are trapped and unable to escape, the home may be the next safest place to stay. Many fatalities occur during the process of evacuation; especially when homeowners wait too long to evacuate. Even when SIP conditions are met, evacuation orders from fire authorities should be followed. The decision to shelter in place should be made by the fire management team and not individual homeowners, and all orders from authorities should be followed.

It is important to understand that all the requirements for shelter in place must be met well in advance of a wildfire. **It is not possible or safe to attempt to create stand alone conditions during a wildfire** - to do so is unwise, and could compromise the safety of the homeowner and firefighters. Furthermore creation of stand alone conditions requires a great deal of advance planning and coordination between the landowners, fire professionals and resource advisors. The landowner should also be aware of both physical and emotional trauma that may be caused by exposure to an extreme fire event.

Shelter in place carries a high level of inherent risk. This recommendation to shelter-in-place should only be followed by individuals who have taken precautionary measures prior to a wildfire event. These can be summarized as follows:

1. Has the structure been determined in advance to be "Stand Alone" by the local fire authority?
2. Is the fire management team aware that shelter in place conditions have been met, and are they aware that residents are being sheltered?
3. Are building materials fire resistant enough to prevent combustion from a flame front or firebrand storm?
4. Is the property defensible with minimal resources?

5. Can the property (ecosystem) actually benefit from fire, or suffer little harm?
6. Can fire be used by professionals in the defense of the property?
7. Are the adjacent properties treated as well?
8. Is the community treated to reduce fire intensity?
9. Have the surrounding areas, including public lands been treated to reduce fire intensity? Are watersheds feeding the community treated?
10. Are there adequate safety zones on the property?
11. Can safety zones within the community be accessed safely during a major fire event?
12. Are driveways and roadways safe for travel during a major event?
13. Are there multiple routes to the safety zone?
14. Has the property owner received formal fire training, and understand fire behavior? Is the owner aware of how conditions can change and hazards that may exist before, during and after the fire? Does the owner have appropriate Personal Protective Equipment (PPE)?
15. Are backup fire prevention/suppression measures in place? In the event of power loss or public water system failure? Examples: Foams, gels, fire retardant systems.
16. Is the person healthy and both physically and mentally fit? Is the person aware of all health and safety risk; both short and long-term?
17. Are sufficient supplies (food, water, medical supplies) on hand for at least a 72 hour period? Roadways may be impassable after the fire due to tree fall, downed power lines, washed out culverts, hazardous materials, etc.

This list is not all-inclusive. It should be noted that individuals who take responsibility for their properties are still dependent on the actions of others. Fuel treatments for the surrounding area are totally dependent on the neighbors, surrounding community, and contiguous forested areas.

Shelter-in-place Structures as Fire Fighter Safety Zones
If sufficient numbers of homeowners within neighborhoods create easily defensible structures, then fire fighting resources can remain in place longer and with a higher degree of safety. Deployment back into neighborhoods to check on structures and perform “mop-up” operations will be situation dependent and must follow NWCG Safety Zone criteria. Ideally, all homes are safety zones and fire fighters can focus on protecting natural resources.

It should be noted that no homes within the Hidden Village community have currently been identified as either SIP or Safety Zones.

In summary, overall access to the neighborhoods is adequate, but could be improved. The concerns raised above, with the exception of paving the roads, can be addressed at minimal expense to the community.

SERVICES, INFRASTRUCTURES, WILDLAND FIRE REPONSES

This section of HVCWPP details professional and voluntary resources available to respond to emergencies associated with wildland fires impacting Hidden Village residents and structures. Professional responders are always the front line in addressing wildfire, rescue and medical emergencies. FEMA has established programs for training of local residents in dealing with multi-hazards. This program, CERT (Community Emergency Response Team), is recommended and can be set up and organized under SMFRA. These voluntary groups are only used when professional first responders cannot respond and then can only be activated by authorization of the Douglas County Office of Emergency Management or the Chief of the local Fire Protection District.

Professional Wildland Fire Response

For wildland fire emergencies endangering Hidden Village, the first line of professional responders is South Metro Fire Rescue Authority (SMFRA). If SMFRA finds that the fire is beyond their capability to suppress, the Incident Commander on-scene will request additional assistance. Assistance will be available through Mutual Aid agreements from both within and outside Douglas County. PSMFA will coordinate and administrate these services.

Douglas County Emergency Management

Douglas County Office of Emergency Management provides the umbrella incident management and agencies coordination structure to the response and recovery from a wildland fire event(s) endangering Douglas County. Every wildland fire emergency incident that occurs in Douglas County utilizes the *Incident Command System* (*ICS*) during response and recovery activities, employing multi-agency operational structures as set forth in the Douglas County *Emergency Operations Plan (DCEOP).*

> In the event of a major wildfire, Douglas County operates under a mutual aid agreement for providing equipment and personnel assistance, if able and available, among its fire fighting agencies. The agreement encompasses, in addition to SMFRA, Larkspur Fire Protection District, County of Douglas, Franktown Fire, Jackson 105 Fire, City of Littleton, Mountain Communities Fire, Parker Fire, West Metro Fire Rescue, Cunningham Fire Department and West Douglas Fire.

As resources begin to deplete and the situation begins to escalate beyond local resources, then municipal and county officials will become involved. At that time, At this point, the need for the Emergency Operations Center (EOC) will be considered. EOCs locations for Douglas County are pre-established by the *DCEOP*. The locations, in order of the listed priority, may change if the facility is not adequate for the situation. The EOC locations are shown in the following table.

Emergency Operation Center Locations, Douglas County

1. Douglas County Sheriff's Office
   Robert A. Christensen Justice Center
   4000 Justice Way
   Castle Rock

2. South Metro Fire Rescue Authority
   Headquarter Building
   10235 Parkglen Way
   Parker

For wildland fire only, mutual aid from local government fire suppression resources can be requested through the Designated Dispatch Center from the on-scene Incident Commander. Requested fire suppression resources would be from entities within Douglas County or from Arapahoe, Elbert, Jefferson, Teller or El Paso counties. Out of county local government resources will be coordinated and placed by either the Colorado State Forest Service Fire Duty Officer and/or Douglas County Office of Emergency Management.

The following is a list of commonly requested resources that are available through Douglas County Office of Emergency Management:

MCP	Dump Trucks	Wildfire Cache	Transport	Sandbags
Dozers	Portalets	Trailers – Flat-	Vehicles	GIS Support
Graders	Event Tents	bed & Cargo	Portable	Barricades
Water Tenders	Radio Cache	Generators	Lighting	Feeding
Sheltering	Animal Rescue	Fuel Trucks	HazMat Trailer	Support
Support	Team	Snowmobiles	Message Signs	Cranes

Douglas County has four primary resource policies within the *DCEOP*: 1) Firefighting operations will be coordinated by the fire district or city department within their jurisdiction; 2) Mutual Aid from other than Douglas County fire agencies will be activated by on-scene Incident Command as necessary and out of county resources will be activated by the Emergency Services Division of Douglas County Sheriff's Office; 3) County Commissioners may request State assistance; and, 4) Local and State Fire Fighting Forces may be augmented by Federal Agencies.

PSMFA's established first strategy for fighting wildland fires endangering the area is *direct suppression.* If suppression is not an option, then a defensive posture will be taken.

Emergency Medical Services

SMFRA provides first response emergency medical services to Hidden Village.

Water Resources

Central water and sewer services are not available within the community. However, water supplies for fire suppression are available from surrounding communities. These are Town of Parker, Pinery, and Tallman development. Under widespread wildfire conditions, hydrant pressures will obviously vary. Water tender operations will be necessary for both structural and wildland fire incidents. Potential tender sites are noted on Figure 16, in Chapter 5.

Civilian and Fire Fighter Staging Areas

During emergency situations, it may be necessary for residents and emergency services providers to reach a safe place that is outside of the community. SMFRA, in conjunction with other wildfire authorities, recommends establishment of staging areas both inside and outside the community. These can be used as reasonably safe areas where little or no wildfire risk exists in close proximity to either natural (vegetation) or man-made (homes) fuels. These may serve two purposes. The first is as a refuge from any wildfire threat. The second is as staging areas to allow timely and orderly evacuation of residents. It should be noted that many of the civilian fatalities from wildfires are caused during evacuations in which residents

become trapped and overrun by fire. Once residents are evacuated, these staging areas may be used by firefighters for marshalling resources within the community. These are shown on maps found in Chapter 5.

For these to be effective, signage/posting will be needed. An annual educational campaign should be established. Posting on the HVPOA web sites will be essential. Mail kiosks can also be used as posting places.

Internal Volunteer Services and Communications

HVPOA currently supports a number of volunteer groups that can be used in communication support or augmentation of professional first-responders within the community in the event of a wildfire emergency. The most important are the HVPOA boards of directors and their committee chairs. It is strongly recommended that each Board implement operating agreements with PSMFA that allow for use of HVPOA properties and facilities during emergency situations. A sample agreement is included in **Appendix G**.

The most frustrating issue for residents during wildfire events is a lack of information. Local media cannot always be relied on for timely and accurate information. Residents may be away from the community at the outbreak of an emergency and require information necessary to protect family members and pets still at home. Possible information sources are the HVPOA web sites and homeowner/neighborhood phone calling “trees”. The Douglas County Office of Emergency Management(DCOEM) may also have an emergency phone line set up to provide information.

The HVPOA board and its committees should develop an emergency response plan for interaction with emergency services providers. This needs to be developed prior to emergencies and allow access of HVPOA Board or designated representatives to the Incident Command Center or command post. In effect, this representative could provide accurate and timely information for distribution over existing community networks (web site, phone trees, office staff).

Critical Utilities

In the event of a wildland fire that would impacts Hidden Village, SMFRA or DCOEM dispatchers would notify critical utilities for their support. Specifically, emergency involvement of utility support would focus on two areas: 1) Safety of the public and emergency response personnel and 2) Direct support of mitigating the emergency event.

Public and Emergency Response Personnel Safety

Beyond the direct emergency, event-damaged or event-threatened gas services and electrical distribution facilities can pose significant safety issues to the public and emergency response personnel. Direct intervention for disconnection, reconstruction or rerouting would be directed by:

Natural Gas Services:	*Xcel Energy 1-800-895-4999* Emergency Service Telephone Number: (800) 895-4999
Electrical Power Services:	*Intermountain Rural Electric Association* Emergency Service Telephone Number: (303) 688-3100
Natural Gas High Pressure Main lines	*Colorado Interstate Gas* Emergency Service Telephone Number 1-877-712-2288

Direct Support

Direct support for water and communication resources in support of an emergency event would be directly provided or directed by:

Water:	*Area water providers (n/a)*
Wire-line Communications:	*Qwest Communications*: Emergency Service Telephone Number: (800) 573-1311
	Comcast Emergency Service Telephone Number: (303) 930-2000

Any communication for support by utilities in an area impacted by a wildfire event must be authorized by the on-scene Incident Command. Any work performed in an impacted area can be requested only by on-scene Incident Command through the Designated Dispatch Center.

Post-Fire Remediation

In the event a large wildland fire should burn significant acres above or in the community, HVPOA will need to immediately reclaim or stabilize areas above homes. Burned areas will be prone to mud slides, debris flows or rock fall hazards. These can have an impact on surviving residences and the Hidden Village road network. The de-nuding of slopes may release sediments and ash into existing drainageways resulting in clogged culverts and overtopping of roadways by storm flows. If flows are heavy and concentrated enough, road surfaces can be washed away. An alert system similar to that used in the Hayman Fire Burn area may be required to warn residents of impending storms that have the potential to cause severe run-off. The HVPOA and/or Douglas County Public Works Department should be prepared to:

1. Immediately retain the services of an engineer, geologist or erosion control specialist to assess potential storm and debris flows after a wildfire of significant size.
2. Establish a stand-by contractor list of licensed and insured heavy equipment operators for clearing of roads, cleaning of culverts and construction of potential diversions or road repairs.
3. Hire a reclamation contractor to stabilize areas above homes and critical infrastructure with a combination of temporary and permanent erosion control measures.

Post-fire issues can linger on for many years after fire occurrence. The HVPOA should annually assess their risks and budget accordingly for remediation.

PUBLIC NOTIFICATION, COMMUNICATION AND SUPPORT

Services communications are made to the general public in two categories: 1) Warnings or emergency information broadcast to the public of specific hazards, such as single or multiple wildfires threatening the communities and 2) Informal informational services and event notifications under non-threatening conditions.

Warnings and Hazard Notification to the General Public

Warning notifications concerning a specific wildfire or wildfires directly threatening Hidden Village can be authorized only by SMFRAor DCOEM. Such a warning can be issued in a variety or combination of methods and will generally contain *action* information for residents. An *action* information or direction may contain preparatory information for residents concerning potential or upcoming evacuation of the area. Or, it may be an immediate, "*act now*" request for evacuation due to a wildfire condition that is deemed to have imminent impact to the area. Authorization, *official* warnings may come from:

1) Emergency Preparedness Network (AKA: Reverse 911)*
2) 850 AM radio, KOA
3) Other local television and radio stations
4) SAME (Specific Area Message Encoding) technology weather radios
5) DCOEM web site

Services Communications and Support Systems

Non-threatening Conditions

Informational notifications of HVPOA residents are done for public meetings, events and general services. Several mediums are used for general public informational notifications including Board of Director notices of meetings, general letter mailing, flyer posting and mailings, and the community's website posting on *www.hiddenvillageco.com* .

Wildfire Condition

In the event of an actual wildfire impacting the community, updated residential wildfire event information should be posted periodically on the HVPOA website. Currently, any changes to the HVPOA web site can be done from any web connection outside the community. Updated information is generally available on messages recorded and made available on event-established, dial-up telephone line(s) by the Douglas County Sheriff's Office. The telephone number(s) of phone line(s) for such use are specific to each event, with the numbers announced to the public via printed or announced on public broadcast mediums. Periodic updates regarding emergency events are also generally broadcasted via 850 AM KOA radio, the official emergency public broadcasted radio station for Douglas County, as well as other radio and television stations.

IMPLEMENTATION PLAN

Chapter 8 provides a summary of actions of the Hidden Village Community Wildfire Protection Plan. These actions are designed to address four broad subject areas to enhance residents' safety and diminish wildfire potential in the HVCWPP area and surrounding areas as identified in Chapter 4, Wildfire Hazard Assessment. The actions to be taken in the public education arena are intended to better prepare residents for helping themselves and nurturing their family's safety needs in times of crisis as well as providing them knowledge to reduce the structural ignition potential of their homes and those of their neighbors. The actions set forth in the Fuels Treatment category are both short term and long term.

Based upon forestry and fire sciences, the Fuels Treatment actions address the mitigation of wildfire fuels in Hidden Village and adjacent privately owned lands. The general periods identified for developing fuel treatments in these high wildfire risk areas is to be based upon both risk potential and funding availability. The priorities associated with these wildfire risk mitigation areas can be found in Chapter 4, *Wildfire Hazard Assessment*, and Appendix A, Hazard *Reduction Mitigation Projects*. The third area addressed by this implementation plan is the communication, support and information services used to provide added knowledge and information to be used in contingency planning for wildfires. The final broad focus area, Mitigated Areas Perpetuation, addresses maintaining fuel mitigated areas once the areas have had wildfire fuels initially reduced as well as on-going HVPOA administrative actions associated with the Community Wildfire Protection Plan.

Public Education

The Hidden Village community has low residential turn-over and influx. Based upon average monthly real estate listings weighted against average home sale time period or "*life on market*," Hidden Village may experience up to 10% change to its profile of residents during the year. Many of these "*new*" residents of Hidden Village may not be initially familiar with living in a high wildfire risk area. The Public Education actions of this Community Wildfire Prevention Plan are planned to educate these newcomers as well as increase the knowledge of the current Hidden Village residential base in areas of family safety, Firewise strategies and construction and landscaping materials that are more resistant to ignition than wood or other commonly used building and landscaping products.

- Topics for public education will vary depending on seasonal or wildfire risk conditions, input or requests from Hidden Village residents and the availability of qualified instructors or presenters. The public education topical areas include but are not limited to:
  - Structural construction materials or design considerations
  - Home safety and home fire warning and fire suppression equipment
  - Home risk self-assessment and structural wildfire risk reduction
  - Residential fuel reduction strategies
  - Landscaping for wildfire protection; xeriscaping
  - Living adjacent to wildlands
  - Home property fuel mitigation strategies and methods

- Public Education programs will use professionally developed instruction material developed from resources recognized for their experience and expertise including,
  - National Firewise Communities USA
  - American Planning Association
  - United States Forest Service
  - Colorado State Forest Service
  - Colorado State University Cooperative Extension
  - Parker South Metro Fire Authority
  - Douglas County

- Private Consultants

- Upon publication of the 2008 Community Wildfire Protection Plan for Hidden Village, the Environmental Committee will develop an annual schedule that is published and periodically recapped in the HVPOA newsletters and web sites. Also, see CSU Extension Fact Sheet 6.302**,** ***Creating Wildfire-Defensible Spaces*** (See Appendix C).

- The following classes were held during the summer of 2008 as part of the CWPP process. Mailings, phone calls and signage were used to promote classes. The classes were:
  - **Firewise Landscaping**- CSFS/CSU wildfire mitigation information was used as the basis for teaching Firewise and Xeriscape landscaping concepts suited for the Hidden Village community. Twenty-eight residents attended.
  - **Extreme Gardening- Taming the Scrub Oak Monster**- Class focused on reducing fuel volumes in shrub species of Hidden Village. Mastication equipment demonstration included brush removal and slash treatment. Seventeen residents attended.
  - **Home Triage**- Class focused on what firefighters need to protect homes. Information based on Firewise Communities home triage as recommended by Jack Cohen, USDA Forest Service. Twenty-four residents attended.
  - **Forest Ecology and Forest Management Principals**- Forest history, ecology and wildfire behavior were presented along with forest management concepts to improve forest health and reduce wildfire intensity. Fourteen residents attended.

Although several public meetings have been held to inform and/or assess the opinions of the general public on *Firewise* and wildfire issues, the 2008 baseline for this implementation plan area is being considered zero. Annual performance assessment of public training will be based upon the public education training and informative session attendance as well as comments and reactions from the general public. For overall impact of the wildfire protection plan program, training session attendance should be totaled annually and expressed as a percentage of Hidden Village total residents. This percentage should be trended year after year for evaluation and public education course management purposes.

Fuels Treatment

It is recommended that negotiations begin with private land owners adjacent to road rights of way areas as well as private lands in general to build fuel breaks with widths as specified by the Colorado State Forest in its *Fuelbreak Guidelines for Forested Subdivisions* (See Appendix E). The acreage of the proposed fuel treatment, coupled with the density/types of vegetation were used to calculate the estimated costs of mitigation associated with each proposed fuel treatment / mitigation project area. An additional factor of ten percent should be added to the estimated cost per acre to account for measurement discrepancies.

Three Proposed Mitigation Strategies

The Hidden Village Community Wildfire Protection Plan employs three strategies for effecting fuel mitigation for the identified and proposed projects. The application of a specific strategy is based upon the ownership and developed or undeveloped aspects of the property proposed for mitigation. The aspects forming the basis of these strategies are two-pronged: cost and legal.

Road Rights of Ways

For properties on which the Douglas County possesses rights of way or on properties directly owned by the County (Open Space), mitigation work may be funded through grants received by the County or HVPOA. This funding will either come from State or private grant funding or through Federal grant monies applied for and received by the County. Permission of Douglas County will be required for any implementation on county properties.

Private Homeowner and Landowner Properties

HVPOA neither has auspices nor declaration of use of private properties within its boundaries. Therefore, fuel mitigation on private properties, although highly encouraged by the HVPOA and SMFRA, is the responsibility of the property owner and should follow CSU Extension Fact Sheet 6.302, *Creating Wildfire-Defensible Spaces* (See Appendix C). However, the HVPOA and SMFRA can provide information and services to assist property owners in their mitigation efforts. These information and services will consist of references, Firewise planning details and planning guides, occasional Firewise training classes, and a slash pile disposal site (Douglas County Slash Mulch Site in Castle Rock). The recent introduction of small mastication (brush grinding) equipment to the community through classes and initial fuel treatments has created a new slash disposal method for all property owners.

On private lands adjacent to neighborhoods, lands or road right-of-ways that have been mitigated to form a fuel treatment, owners are encouraged to work with HVPOA in "*feathering*" the mitigated fuel treatment into their private property to attain a wider fuel treatment as recommended by Colorado State Forest Service.

HVPOA Properties and Easements

The HVPOA should work on mitigating its properties on an ongoing basis. Both the HVPOA and SMFRA should work together to assess potential in-fill areas that may be planned in these currently undeveloped but prime focus areas. Bridle paths, located in easements and protected by the HVPOA covenants, are shown in Figure 17. Portions of the bridle path were treated in August 2008 with mastication equipment which created a more defensible space where fuels were reduced.

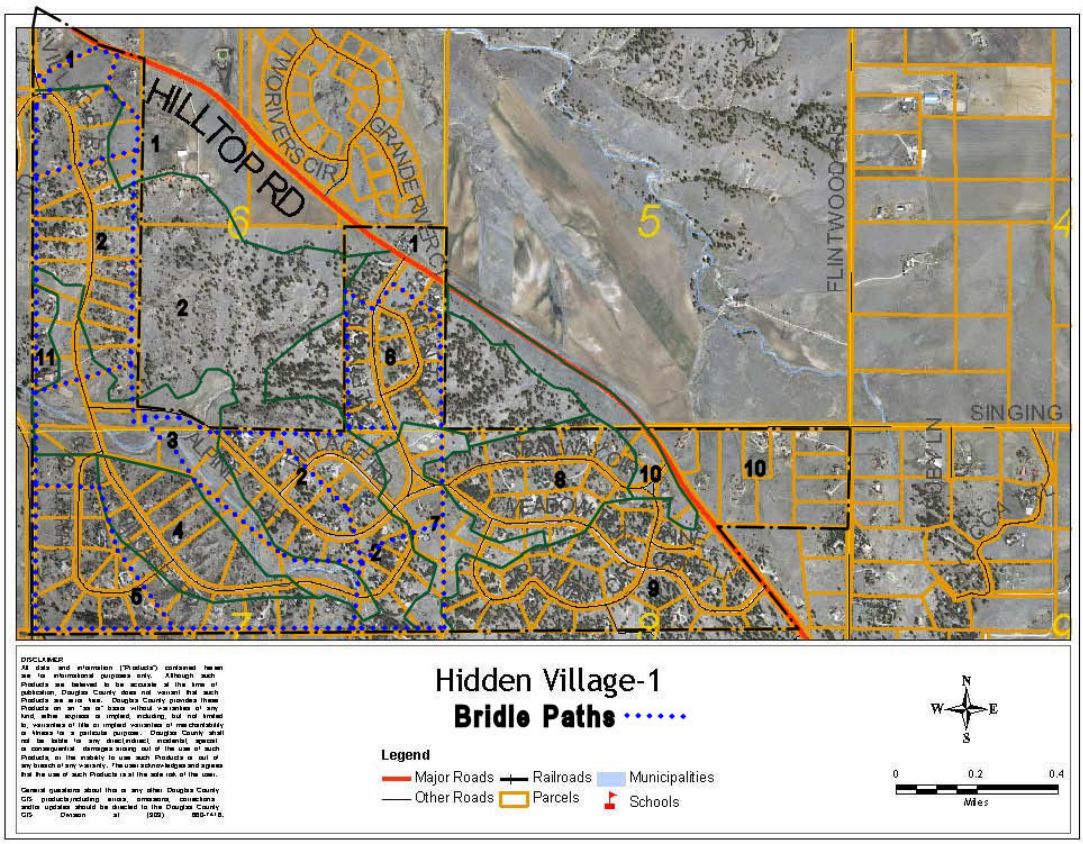


Figure 17, Bridle Paths within Hidden Village

Proposed Wildfire Fuel Treatment Areas

The community is divided into 11 compartments for the process of locating and defining potential wildfire fuel treatment needs. This information is shown below using compartment maps (see Figure __) for the reader to reference and summarized on a compartment by compartment basis to designate project location, specific fuel treatment, and mitigation priority (Appendix A). Also shown is the location description, estimated mitigation acreage of the proposed fuel treatment and broad, estimated cost of the project.

Fuel Reduction Project Prioritization

The risk priority associated with each of the mitigation projects proposed in this plan was established by basing the decision on a number of factors.

1) The individual area and structures protected (Density of homes and structures);
2) Type and density of vegetation (Ignition and spread components);
3) Slope of area to be mitigated and slope of area to be protected (Spread component);
4) Position of area to be protected in relation to significant wildland urban interface areas; e.g., abutting heavily-treed forest land, fine fueled grassland or contiguous private undeveloped land (buffer zones);
5) Wildfire characteristics of each area learned from fire experience;
6) Area presenting large impact in potential wildfire reduction;
7) Area heavily impacted from lightning activity.

Type of Mitigation Used for Projects

The type of mitigation or method of fuel mitigation deemed appropriate for a specific area will be chosen when the area is assessed and base-lined shortly prior to mitigation being performed. As indicated in Appendix E, *Fuelbreak Guidelines for Forested Subdivisions*, care will be closely given to assure environmental aesthetics of the immediate and surrounding area of mitigation projects.

Scheduling

The scheduling for specific mitigation projects will be based on four factors and periodically reviewed by stakeholder agencies party to this Community Wildfire Protection Plan:

1) Hazard risk priority for the mitigation project;
2) Cost of the project and manner of funding to be used;
3) Environmental considerations required for specific mitigation prescriptions; e.g., slash pile burning, prescribed fire, moisture levels, air quality management, etc.
4) Timing of "*tie-in*" projects impacting terrain identified for fuel reduction; e.g., development activity.

The time schedule associated with imminent, planned fuel mitigation projects will be posted on the HVPOA websites. Written notification may also be used and may take the form of announcements in the HVPOA newsletters, local newspapers, flyers, direct mailings or combinations of any of these mediums.

Priorities for Treatment

Three main areas are targeted for treatment. These are:

1. Egress/Evacuation Routes - Road right-of-ways are typically 60 feet wide throughout the community. All heavy fuels along roadways should be treated to reduce fire intensity to a level that can be survived while in a vehicle. The long range goal for all roadways is to have flames on the ground in lighter fuels versus dangerous flame lengths that may extend into the roadway.

2. Home Ignition Zones- All homes and lots should be treated to a level sufficient to prevent home ignition from both flame impingement and aerial firebrands (embers). **All homeowners should follow CSU Extension Fact Sheet 6.302, *Creating Wildfire-Defensible Spaces* (See Appendix C).** This goal will be accomplished primarily through education. Home insurability will also factor into decisions by homeowners to mitigate their homes and properties. Replacement of shake roofs should also be a priority.

3. Staging Areas- Areas with low fuel volumes, primarily native grasses, may serve as temporary staging areas for residents and fire fighters. These should meet NWCG (National Wildfire Coordinating Group) standards for safety zones and are included in Appendix F.

4. Surrounding areas that will affect fire behavior from one lot to the next, or from outside the community. This may include the more remote areas of residential lots well outside the lot owners home ignition zone. Bridle path maintenance will fall within these areas

Compartments/Stands- Methods for Treatment

The community has been divided into 11 different stands that will also serve as compartments. These range from open grasslands to heavy timber. These are shown in Figure 18.

a. Grasslands, native prairie: Prescription for treatment is regular mowing and regular noxious weed control. Timing of mowing is typically at time of grass curing/drying (July/August). Areas not mowed in late summer or fall should be mowed in the spring if insufficient snow was present to lay down aerial fuels. Mowing should also be timed to

allow for adequate reseeding of native grasses and wildflowers. Estimated fuel treatment cost is $100/acre (mowing at $25/acre, weed control at $75/acre).

b. Open Pine with grasses: Prescription for treatment is periodic mowing and removal of ladder fuels to a height of 10 feet above ground level. Ladder fuels under mature pines should be removed to reduce tree losses. Low intensity ground fire typically burned under and around native pines with minimal tree losses. Estimated fuel treatment cost is $500/acre (mowing at $25/acre, weed control at $75/acre, pruning and slash disposal at $400/acre).

c. Mature Brush: Prescription for treatment is to break up fuel continuity both horizontally and vertically. Remove dead material and prune clumps to a three foot height. Recommended clump size and spacing is: Clumps should not be wider than two times their height. Clump separation should be at least 2.5 times their height. Estimated fuel treatment cost is $500/acre (est. cost based on use of mastication equipment. If hand treated, est. cost can be as high as $1,200/acre).

d. Heavy Timber: Prescription for treatment should focus on both improving tree health while increasing tree crown separation to reduce crown fire risk. Overtopped and suppressed trees should be removed from underneath mature pines. Brush should be cleared from under pines to a distance ten feet beyond their driplines (extent of outer branches) to reduce tree branch scorching. Trees should be pruned to a height of ten feet above ground level. No more than 1/3rd of live branches should be removed at any one time. Estimated fuel treatment cost is $1,200/acre (est. cost based on hand cutting of overtopped/suppressed trees and mastication of slash. If chipping is used for slash disposal, est. cost is $1,800/acre.).

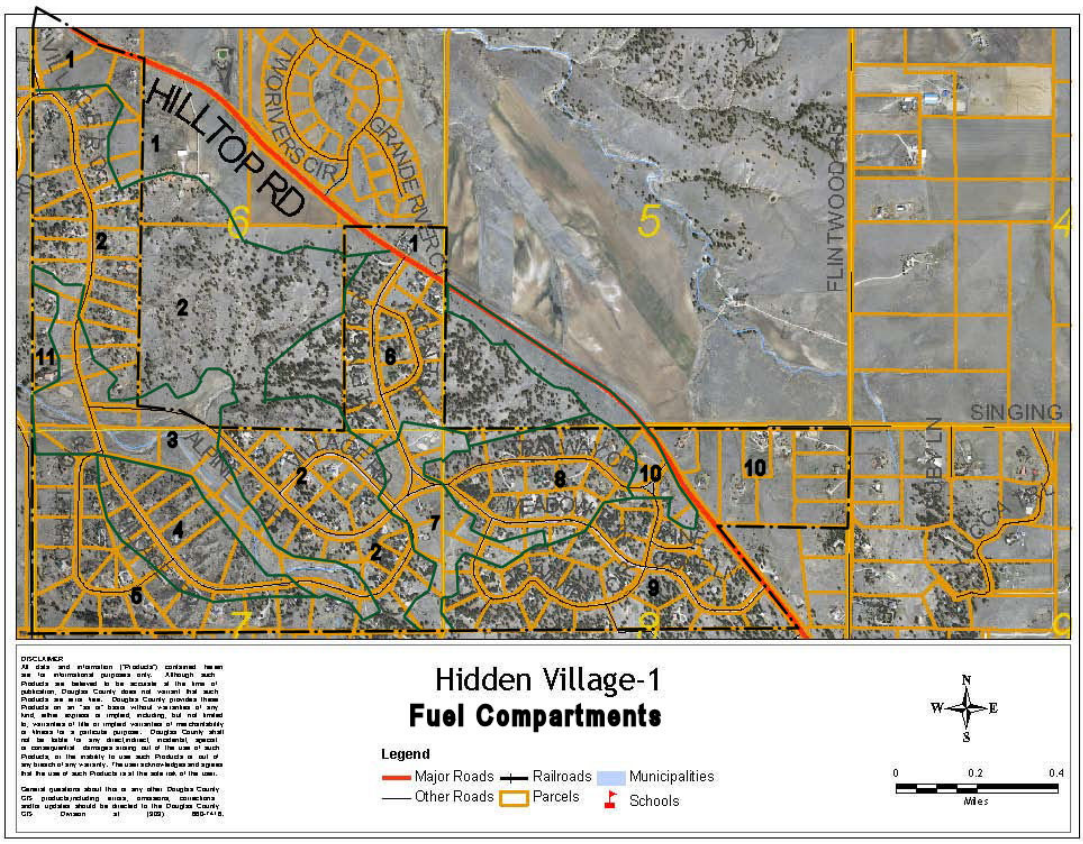


Figure 18, Fuel Compartments (stands)

Slash Disposal

A major impediment to homeowner mitigation is disposal of the biomass once a decision has been made to begin mitigation. Douglas County currently operates a "Slash-Mulch Site", located at the Town of Castle Rock maintenance yard off Caprice Drive. This works for homeowners that have pickups or trailers to haul to the slash site. Other programs may be necessary to allow for timely mitigation. Some of these might include:

1. Regularly scheduled slash chipping days where homeowners place the slash at curb-side for treatment by a contractor. HVPOA committees can be used to administer this type of program which may be funded by the end users.
2. Regular slash pickups by disposal contractors that charge based on the volume removed.
3. Neighborhood or block projects where each homeowner chips in to rent a chipper or hire a contractor to process slash.

All owners are encouraged to retain the chipped material on their properties as mulch in their landscaping. This will avoid having material end up in landfills.

Architectural Control

In 2005, the Colorado State Legislature passed SB-100 spelling out actions allowed by homeowners in covenant controlled communities. One of these measures was the allowance for homeowner mitigation where strict controls may have inhibited homeowner ability to reduce wildfire risks. The section of SB-100 pertinent to wildfire mitigation is attached as Appendix B.

HVPOA can maintain control of its resident's projects under the requirement for submittal of a plan prepared by a qualified professional forester, CSFS forester, or the Fire Department. Approval cannot be unreasonably withheld.

Road Rights of Way and Safety Zones

Fuel treatments provide quick, safe access for wildfire suppression; as such, they are necessarily linked with roads systems. Where possible, potential fuel treatments proposed in this Plan have been connected with Douglas County roads and time-established trails within Hidden Village's less developed areas. The potential fuel treatments will provide adequate access and defensive positions for firefighting equipment and support vehicles.

Adequately designed Staging Zones can aid both resident and firefighters. These will need to be monitored throughout the growing season for potential wildfire risks. Once constructed, the primary need will be mowing.

<u>Implementation Actions</u>

- Mitigate existing road areas within the right of way associated with the road. Permission is required from Douglas County. Generally, in all established and planned roads within Hidden Village, this action creates a fuel gap of 60-120 feet; i.e., 30 feet either side of the centerline of the road. Although Colorado State guidelines for fuelbreaks are generally 300 feet or greater, depending on fuel density and slope, this Community Wildfire Protection Plan initially establishes a break of 60 feet since it can be addressed quickly within the road right of way, followed later by working with adjacent landowners to encourage widening the fuel gaps by encouraging "*feathering*" of the fuel treatments into their private land. The HVPOA Boards will:

- Work with SMFRA, Douglas County, and CSFS to assess and cooperate on joint fuel mitigation projects;
- Review prioritization of fuel mitigation projects and schedule projects annually based upon funding and the identified risk priority of the projects;
- Take action to establish a separate budgeting category (2009 and yearly beyond) to identify "*direct*" budgeted dollars to be directed at road right of way mitigation projects and mitigation projects associated with established and recognized trails and lands within HVPOA properties;
- Detail and file for particular Federal grants awarded annually for fuel mitigation and wildland fire protection support. Funding may be channeled through CSU/CSFS as "sub-awards";
- Develop and update annually, a long-range (five to twelve year) schedule of wildfire fuel mitigation projects and post the schedule on the HVPOA websites for public access.
- Inspect all treated areas periodically to determine need for re-treatment and/or on-going maintenance.

Hidden Village Properties

The HVPOA has the opportunity to use its properties to demonstrate good property management and ecosystem restoration. Greenbelt areas away from main roadways and safety zones can either help or hinder individual homeowner actions. Where possible, HVPOA properties should be treated to a higher level than that on private property; especially where no defensible space can be created by individuals due to property size, ownerships or absentee landowners. On-going maintenance by outside contractors or homeowner volunteers will be important to provide risk reduction for adjacent home sites.

Implementation Actions

The HVPOA Environmental Committee and Design Review Committee (or Architectural Control Committee) will need to work closely to insure that treatment projects allow for some level of privacy protection currently provided by the over-grown and declining gambel oak plant community. Visual sensitivity will be important. The HVPOA Boards will:

- Work with wildfire professionals (foresters and firefighters) to lay out treatment areas on HVPOA properties by advising the DRC/ACC of all activities. Coordination with adjacent property owners will be necessary.
- The same items noted under Fuel Treatments and Staging Areas will apply.

Private Homeowner and Landowner Properties

Wildfire fuel mitigation on private properties is the responsibility of the property owner. Having no authority over private lands, HVPOA will provide information and services to assist property owners in their mitigation efforts. Land owners adjacent to HVPOA properties will be encouraged to work with HVPOA in extending mitigated fuelbreaks into their private property following CSU Extension Fact Sheet 6.302, Creating Wildfire-Defensible Spaces (See Appendix C). Such potential action is deemed to benefit both the HVPOA and the individual landowner(s).

Implementation Actions

- HVPOA and/or SMFRA will work with private property owners within the boundaries of CWPP area to support them in mitigation efforts by:
  - Provide resource and education help as indicated in the "*Public Education*" actions, above;
  - Complete at least one demonstration site in each fuel type throughout the community.
  - Continue to assist in tracking "*in kind*" private fuel mitigation work on private property;
  - Administer certain support projects; e.g., periodic *slash* removal;

- Continue to support funding for the Douglas County/Town of Castle Rock slash and yard waste disposal site;
- Formalize Design Review processes and Design Guideline modifications that allow for implementation of Defensible Spaces. These shall utilize the services of SMFRA fire fighters, CSFS or approved professional foresters.
- Continue to encourage replacement of wood shake-shingle roofs by allowing as many materials as possible. Alternatives that maintain the aesthetic values currently established, while providing a "Class A" level of protection are critical.
- Provide information distribution of wildfire planning or Firewise events or activity affecting the homeowner;
- Provide volunteer notification and limited assistance of homeowners during an emergency event.

Undeveloped, Privately-owned Properties

With over eighty-five percent of Hidden Village lots developed, areas of undeveloped land lie to the north of the Hidden Village area (See Chapter 4, *Hazard Assessment* and Appendix A, *Hazard Reduction Mitigation Projects*). These areas are heavily covered with dense, untreated brush and, in many situations, also present rough, sloping terrain. Consequently, these areas present huge fuel beds for wildfires and present Hidden Village with its most significant threats for wildfires. The undeveloped, and generally privately-owned, areas may require Hidden Village to take more aggressive action on its properties in order to address fuel reduction.

Implementation Actions

- The HVPOA and/or PSMFA will work with private property owners of undeveloped lands bordering on Hidden Village to discuss, assess, and plan potentially joint mitigation efforts. Concurrently, HVPOA will pursue collaboration with Town of Parker agencies and Douglas County officials to assist and support efforts to reduce Hidden Village wildfire exposure by addressing undeveloped areas. Such actions will include efforts to:
  - Assess timing of in-fill development in currently undeveloped areas and working with developers, in conjunction with the Town of Parker, to effect guideline driven fuel mitigation on their targeted properties prior to structure construction;
  - Initiate further discussion with owners of small horse parcels, to assess potential individual and joint wildfire mitigation efforts on common interest areas.

Maintenance of Fuel Treatment Areas

The focus of this broad section of the Implementation Plan is twofold: 1) to address the guidelines for assessing when to maintain fuel areas that have already had fuel reduction efforts applied and 2) to set forth a checklist of administrative actions that need to be followed by the HVPOA.

Implementation Actions

- To maintain mitigated areas, private property owners and the HVPOA board should:
  - Assess mitigated property periodically and determine the relationship of the property's vegetation growth against the maintenance guideline for the mitigated property;
  - Grasses should be kept mowed to a maximum height of 6 inches during the wildfire season.
  - Ladder fuels need to be removed from residual trees and kept pruned up 7-10 feet above ground level.
  - Dead materials should be removed from shrubs.

- The HVPOA Board should implement the following administrative actions:
  - Establish a separate HVPOA budget category, which denotes funds for CWPP planned actions (For ledgering and future financial analysis, sub-categories should underpin the category to track expenditures for HVPOA property, privately owned property support functions and HVPOA work with undeveloped parcels of privately or publicly owned land);
  - Detail a chronological schedule for filing for Federal grants applicable to mitigation and Firewise work as these may become available;
  - Budget specific HVPOA funds for "*direct*" funded wildfire fuel mitigation on road/trail rights of ways and HVPOA owned property;
  - Manage contact and begin discussion with private property owners adjacent to Hidden Village neighborhoods for potential individual and joint wildfire mitigation efforts on common interest areas;
  - Sponsor regular wildfire prevention training for residents in conjunction with SMFRA;
  - Assess timing of and maintain a schedule of land development action in currently undeveloped areas;
  - Schedule appropriate, periodic general public updates of CWPP planned work;
  - Establish and maintain baseline information for proposed areas of mitigation;
  - Evaluate planned CWPP projects for effectiveness and amend CWPP annually to keep plan and actions current and appropriate for changing environmental and development conditions.

Appendix A

Hazard Reduction

And

Mitigation Chart

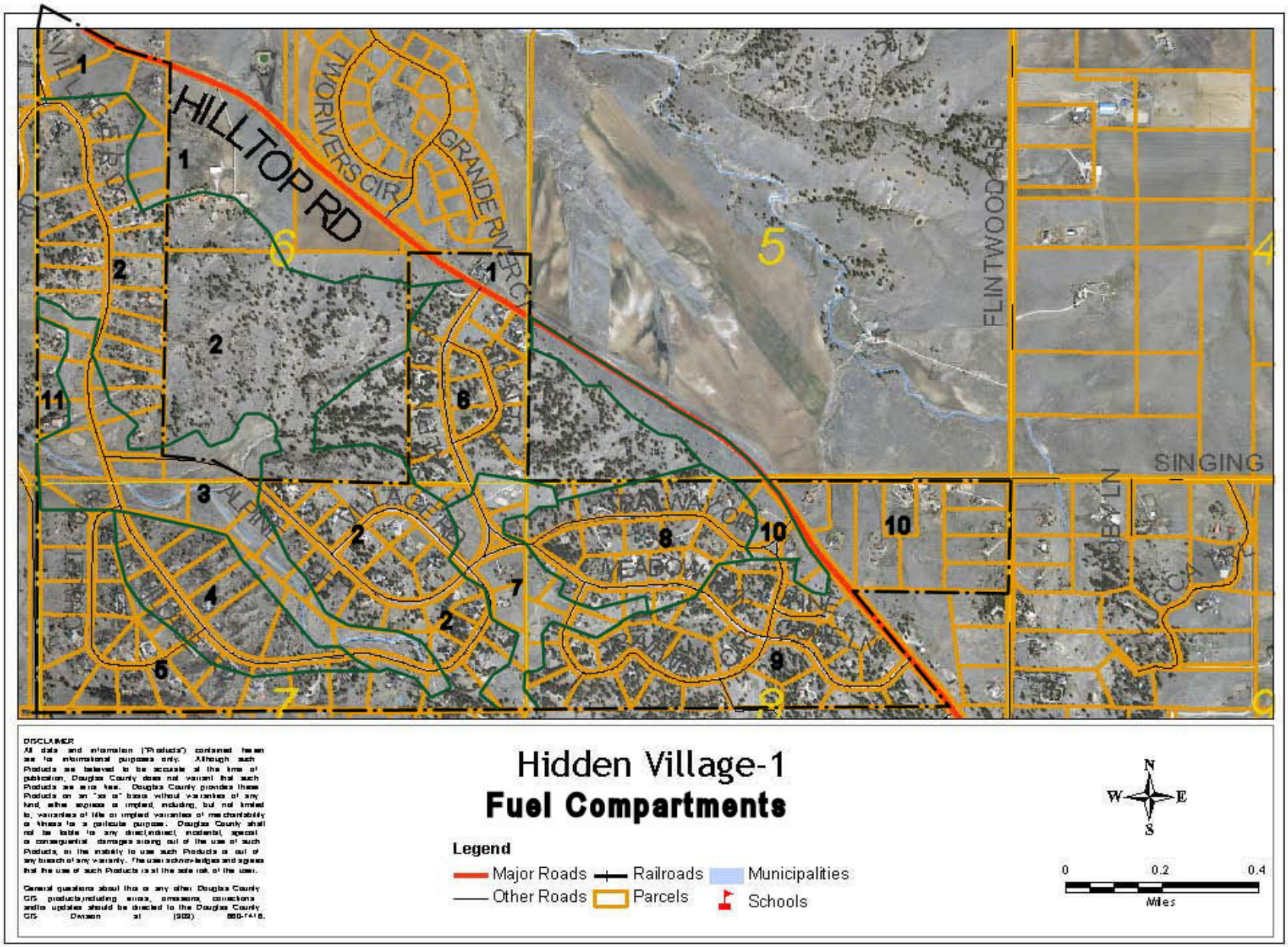
Hazard Reduction Project Chart
September 27, 2008

Stand #	Priority	Acres	Est.Cost Per acre	Roadway Length	# of D-Spaces	Street Treatment Areas	Potential Project(s)	Est. Cost
1	4	48.8	$100 (annual)	1150	2	N. Village Road, Annual mowing of ROW. Done by DC	None	
2	3	183.0	$100 (annual) $400	2980	32	North Village Road- Light treatment of fuels along road.	Prune all dead wood from shrubs in ROW, prune all pines to height of 10.	$1,800
	2		$100 (annual) $400	2926	10	Alpine Drive- Treat pockets of fuel along roadway	Prune all dead wood from shrubs in ROW, prune all pines to height of 10.	$2,500
3	3	81.0	$100 (annual)	3250	1	N. Village Road- Annual mowing ROW. Done by DC.	None	
	3		$100 (annual)	1765	0	Alpine Drive- Annual mowing of ROW. Done by DC.	None	
4	2	58.3	$500 (mast.) $1200 (by hand)	2444	15	N. Village Drive- Treat pockets of fuel in ROW.	Prune all dead wood from shrubs in ROW, prune all pines to height of 10. Use mastication to treat 100-150' into all lots to break up fuel continuity. **Demonstration** Area Acres to be treated: 16.8 at $500/acre	$8,400
5	2	93.6		3560	14	Chalet Circle- Treat pockets of fuel in ROW.	Prune all dead wood from shrubs in ROW, prune all pines to height of 10.	$5,340
6	2	67.0	$100 (annual) $400	2890	6	Alpine Drive- Treat pockets of fuel and pine regeneration in ROW.	Thin dense pockets of pine regeneration and prune all pines to height of 10' along ROW.	$2,890
	2		$100 (annual) $400	1750	8	Glen Circle- Treat pockets of fuel and pine regeneration in ROW.	Thin dense pockets of pine regeneration and prune all pines to height of 10' along ROW.	$1,750

7	3	45.0	$100 (annual)	771	3	Alpine Drive- Annual mowing ROW. Done by DC.	None	
	3		$100 (annual)	380	0	S. Trailway Circle- Annual mowing of ROW. Done by DC.	None	
8	2	67.0	$100 (annual) $400	2581	11	N. Trailway Circle- Treat pockets of fuel and pine regeneration in ROW.	Thin dense pockets of pine regeneration and prune all pines to height of 10' along ROW.	$2,580
	2		$100 (annual) $400	2120	8	Meadow Run- Treat pockets of fuel and pine regeneration in ROW.	Thin dense pockets of pine regeneration and prune all pines to height of 10' along ROW.	$2,120
9	1	118.0	$1200 (Hand & Mast.)	4458	18	S. Trailway- Treat pine regeneration in ROW.	Thin dense pockets of pine regeneration and prune all pines to height of 10' along ROW.	$6,690
	1			3085	8	Meadow Run- Treat pine regeneration in ROW.	Thin dense pockets of pine regeneration and prune all pines to height of 10' along ROW.	$4,630
10	3	78.6	$100 (annual)	500	2	N. Trailway Circle- Annual mowing of ROW. Done by DC.	None	
	4		$100 (annual)	2680	5	Singing Hills- Annual mowing of ROW. Done by DC.	None	
	4		$100 (annual)	3117	4	Flintwood Road- Annual mowing of ROW. Done by DC.	None	
11	3	9.7	$100 (annual) $400	0	3	N. Village Road- No ROW.	None	
Totals		850.0			150			$38,700
Other 9	1						Demonstration site on heavy timber site to show proper tree spacing, forestry practices and home ignition zone implementation. (5 acre lot)	$5,000
6 or 8	1						Demonstration site in mixed brush/conifer/prairie fuels on 5 acre lot	$2,500

Stand #	Priority	Acres	Est. Cost	Roadway Length	# of D-Spaces	Treatment
1	4	48.8		1150	2	N. Village Road, Annual mowing of ROW. Done by DC
2	3	183.0		2980	32	North Village Road- Light treatment of fuels along road.
	2			2926	10	Alpine Drive- Treat pockets of fuel along roadway
3	3	81.0		3250	1	N. Village Road- Annual mowing ROW. Done by DC.
	3			1765	0	Alpine Drive- Annual mowing of ROW. Done by DC.
4	2	58.3		2444	15	N. Village Drive- Treat pockets of fuel in ROW.
5	2	93.6		3560	14	Chalet Circle- Treat pockets of fuel in ROW.
6	2	67.0		2890	6	Alpine Drive- Treat pockets of fuel and pine regeneration in ROW.
	2			1750	8	Glen Circle- Treat pockets of fuel and pine regeneration in ROW.
7	3	45.0		771	3	Alpine Drive- Annual mowing of ROW. Done by DC.
	3			380	0	S. Trailway Circle- Annual mowing of ROW. Done by DC.
8	2	67.0		2581	11	N. Trailway Circle- Treat pockets of fuel and pine regeneration in ROW.
	2			2120	8	Meadow Run- Treat pockets of fuel and pine regeneration in ROW.
9	1	118.0		4458	18	S. Trailway- Treat pine regeneration in ROW.
	1			3085	8	Meadow Run- Treat pine regeneration in ROW.
10	3	78.6		500	2	N. Trailway Circle- Annual mowing of ROW. Done by DC.

	3			2680	5	Singing Hills- Annual mowing of ROW. Done by DC.
	3			3117	4	Flintwood Road- Annual mowing of ROW. Done by DC.
11	2	9.7		0	3	N. Village Road- No ROW.
		850.0			150	


HILLTOP RD
VILLAGE RD
MORIVERS CIR
GRANDE RIVER CIR
FLINTWOOD RD
SINGING
ALPINE
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General questions about this or any other Douglas County GIS products,including errors, omissions, corrections and/or updates should be directed to the Douglas County GIS Division at (303) 660-7418.
Hidden Village-1
Fuel Compartments
Legend
Major Roads
Railroads
Municipalities
Other Roads
Parcels
Schools
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Appendix B

Senate Bill 100

Permission for Wildfire Mitigation

In Homeowner Associations

SB-100 language

C.R.S 38-33.3-106.5 (a.k.a. SB-100) states*: " Not withstanding any provision in the declaration, bylaws, or rules and regulations of the association to the contrary, an association shall not prohibit any of the following: (e) The removal by a unit owner of trees, shrubs, or other vegetation to create defensible space around a dwelling for fire mitigation purposes, so long as such removal complies with a written defensible space plan created for the property by the Colorado State Forest Service, an individual or company certified by a local government entity to create such a plan, or the fire chief, fire marshal, or fire protection district within whose jurisdiction the unit is located, and is no more extensive than necessary to comply with the plan. The plan shall be registered with the association before the commencement of work. The association may require changes to the plan if the association obtains the consent of the person, official or agency that originally created the plan. The work shall comply with applicable association standards regarding slash removal, stump height, revegetation, and contractor requirements."*

Appendix C

CSU Extension Fact Sheet 6.302

Creating Wildfire Defensible Zones

FORESTRY

Creating Wildfire-Defensible Zones no. 6.302

by F.C. Dennis [1]

Quick Facts...

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

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

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

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

Colorado State University Extension

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

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

Defensible Space

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

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

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

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

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

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

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

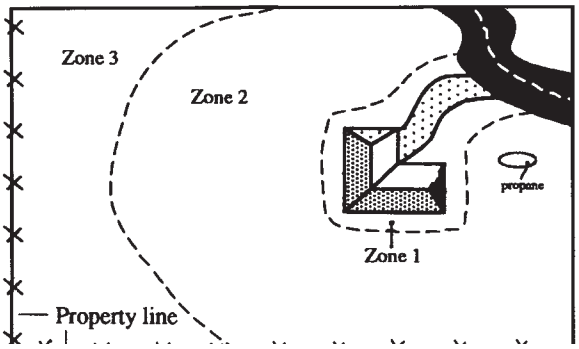


Figure 1: Forested property showing the three fire-defensible zones around a home or other structure.

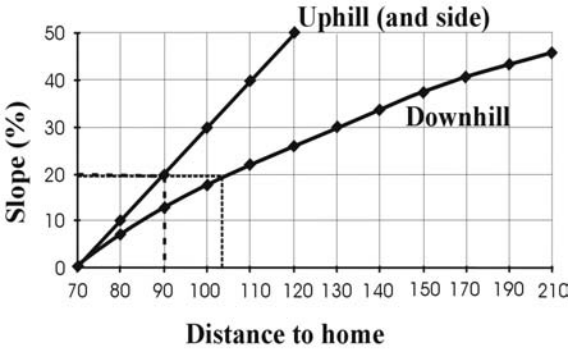


Figure 2: This chart indicates the *minimum recommended* dimensions for defensible space from the home to the outer edge of Zone 2. For example, if your home is situated on a 20 percent slope, the minimum defensible space dimensions would be 90 feet uphill and to the sides of the home and 104 feet downhill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

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

Defensible Space Management Zones

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

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

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

Prescriptions

Zone 1

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

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

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

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

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

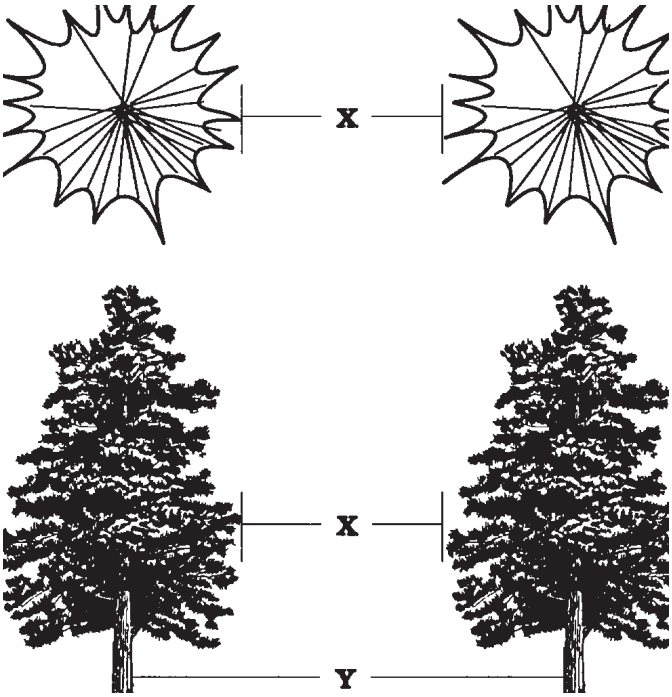
Ideally, remove all trees from Zone 1 to reduce fire hazards. If you do keep a tree, consider it part of the structure and extend the distance of the entire defensible space accordingly. Isolate the tree from any other surrounding trees. Prune it to at least 10 feet above the ground. Remove any branches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

Zone 2

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

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

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



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

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

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

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

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

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

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

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

Figure 4: Minimum tree crown and shrub clump spacing.

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

Figure 5: Minimum tree spacing for Zone 3.

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

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

Zone 3

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

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

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

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

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

Mowing is not necessary in Zone 3.

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

Special Recommendations

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

Brush and shrubs

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

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

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

Grasses

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

Windthrow

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

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

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

Maintaining Your Defensible Space

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

Figure 6: Minimum defensible space size for grass fuels.

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

Defensible Space and FireWise Annual Checklist

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

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

References

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

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

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

- 6.303, *Fire-Resistant Landscaping*
- 6.304, *Forest Home Fire Safety*
- 6.305, *FireWise Plant Materials*
- 6.306, *Grass Seed Mixes to Reduce Wildfire Hazard*

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

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

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

Appendix D

Project Evaluation

And

Monitoring Sheet (Sample)

Hidden Village Property Owners Association
Community Wildfire Protection Plan
Evaluation and Monitoring

Evaluator: _____

Date:_____

Treatment Area: _____

Description/Location: _____

Implemenation Monitoring:
Was the project treatment area part of the CWPP? YES _____ NO _____

What is the project treatment area's assigned priority (1-4)? _____

What resources are being protected by this project?
- Transportation Routes? _____
- Refuge Zones? _____
- Homes? _____
- Neighborhood? _____
- Community Infrastructure? _____

Was the project completed as scheduled? YES _____ NO_____
What problems were encountered? _____
_____
_____

Baseline Monitoring
Have "before" and "after" photos been taken? YES ____ NO _____
By whom? _____

Effectiveness Monitoring

Was the prescription met for:	Yes	No
Fuel Treatment		
Habitat Restoration		
Aesthetics		
Privacy/screening		
Forest Health		

Resprouting/regrowth was: Excellent _____ Good _____ Fair ____ Poor ____ Not present _____
Did erosion occur? Yes ____ No_____
Invasion by noxious weeds? Yes ____ No_____
Was sufficient moisture available for plant growth?

Validation Monitoring
What is the variance from the estimated cost (amount over or under budget)? _____
Was the site accessible as anticipated? Yes ____ No_____
Was the prescription accurate in terms of treatment method? Yes ____ No _____
Are contractors available to provide competative bids? Yes _____ No _____

Trend Monitoring
Have costs increased over past years? Yes ____ No____ By what percentage (up or down)? _____
How did the weather pattern/moisture levels affect the treatment areas? _____
_____
_____
Have any wildfires occurred in or near the treatment areas? Yes ____ No_____
Has community perception of fuel treatments changed? Positive? _____ Negative? _____
How quickly did wildlife return to the areas? Immediately _____ Slowly _____ Never _____

Other comments:

_____
_____
_____
_____

Appendix E

Fuelbreak Guidelines

For

Subdivisions and Communities
(CSFS, undated)

Fuelbreak Guidelines for Forested Subdivisions & Communities

By

Frank C. Dennis

Colorado State Forest Service

Knowledge to Go Places

This publication was developed for use by foresters, planners, developers, homeowners' associations and others. Implementation of these measures cannot *guarantee* safety from all wildfires, but will greatly increase the probability of containing them at more manageable levels.

Inadequate fire planning can result in loss of life or property and costly suppression activities.

Colorado's forested lands are experiencing severe impacts from continuing population increases and peoples' desire to escape urban pressures. Subdivisions and developments are opening new areas for homesite construction at an alarming rate, especially along the Front Range and around recreational areas such as Dillon, Vail, and Steamboat Springs.

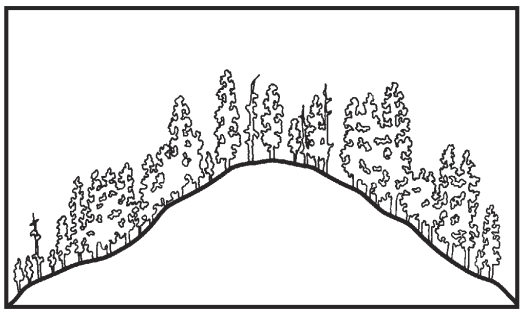
But with development inevitably comes a higher risk of wildfire as well as an ever-increasing potential for loss of life and property. Methods of fire suppression, pre-suppression needs, and homeowner and fire crew safety must all be considered in the planning and review of new developments as well as for the "retrofitting" of existing, older subdivisions.

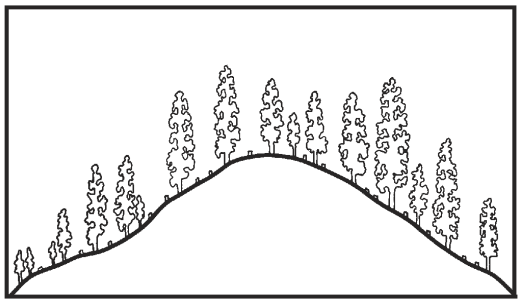
Fuelbreaks should be considered in fire management planning for subdivisions and developments; however, the following are guidelines **only**. They should be customized to local areas by professional foresters experienced in Rocky Mountain wildfire behavior and suppression tactics.

Fuelbreak vs Firebreak

Although the term fuelbreak is widely used in Colorado, it is often confused with firebreak. The two are entirely separate, and aesthetically different, forms of forest fuel modification and treatment.

• A firebreak is strip of land, 20 to 30 feet wide (or more), in which all vegetation is removed down to bare, mineral soil each year prior to fire season.





Above, cross section of mixed conifer stand before fuelbreak modification. Below, after modification.

• A fuelbreak (or shaded fuelbreak) is an easily accessible strip of land of varying width (depending on fuel and terrain), in which fuel density is reduced, thus improving fire control opportunities. The stand is thinned, and remaining trees are pruned to remove ladder fuels. Brush, heavy ground fuels, snags, and dead trees are disposed of and an open, park-like appearance is established.

The following is a discussion of the uses, limitations, and specifications of fuelbreaks in wildfire control and fuels management.

Fuelbreak Limitations

Fuelbreaks provide quick access for wildfire suppression. Control activities can be conducted more safely due to low fuel volumes. Strategically located, they break up large, continuous tracts of dense timber, thus limiting uncontrolled spread of wildfire.

Fuelbreaks can aid firefighters greatly by slowing fire spread under normal burning conditions. However, under extreme conditions, even the best fuelbreaks stand little chance of arresting a large

Before and after photos of a forest stand thinned to reduce fuel loads.

fire, regardless of firefighting efforts. Such fires, in a phenomenon called "spotting," can drop firebrands 1/8-mile or more ahead of the main fire, causing very rapid fire spread. These types of large fires may continue until there is a major change in weather conditions, topography, or fuel type.

It is critical to understand: A fuelbreak is the line of defense. The area (including any homes and developments) between it and the fire may remain vulnerable.

In spite of these somewhat gloomy limitations, fuelbreaks have proven themselves effective in Colorado. During the 1980 Crystal Lakes Subdivision Fire near Fort Collins, crown fires were stopped in areas with fuelbreak thinnings, while other areas of dense lodgepole pine burned completely. A fire at O'Fallon Park in Jefferson County was successfully stopped and controlled at a fuelbreak. The Buffalo Creek Fire in Jefferson County (1996) and the High Meadow Fire in Park and Jefferson Counties (2000) slowed dramatically wherever intense forest thinnings had been completed. During the 2002 Hayman Fire, Denver Water's entire complex of offices, shops and caretakers' homes at Cheesman Reservoir were saved by a fuelbreak with no firefighting intervention by a fuelbreak.

Burned area near Cheesman Reservoir as a result of the Hayman Fire. Note the unburned green trees in the middle right of the photo, a treated fuelbreak.

The Need For A Fuelbreak

Several factors determine the need for fuelbreaks in forested subdivisions, including: (1) potential problem indicators; (2) wildfire hazard areas; (3) slope; (4) topography; (5) crowning potential; and (6) ignition sources.

Potential Problem Indicator

The table below explains potential problem indicators for various hazards and characteristics common to Colorado's forest types. All major forest types, except aspen, indicate a high potential for wildfire hazard.

Fuel Type	Characteristics			Hazards			
	Aesthetics	Wildlife	Soil	**Wildfire**	Avalanche	Flood	Climate
Aspen	2	3	3	**2**	4	3	2
Douglas-fir	2	2	3	**5**	2	2	3
Greasewood-Saltbrush	4	2	2	**2**	1	3	3
Limber-Bristlecone Pine	3	2	4	**3**	4	2	5
Lodgepole Pine	2	2	3	**5**	4	2	4
Meadow	5	4	4	**2**	3	4	3
Mixed Conifer	2	1	1	**5**	3	1	3
Mountain Grassland	5	3	4	**3**	3	2	4
Mountain Shrub	3	5	4	**4**	2	2	3
Piñon-Juniper	2	3	4	**4**	2	3	2
Ponderosa Pine	2	3	1	**5**	2	2	3
Sagebrush	4	4	3	**3**	3	2	3
Spruce-Fir	2	3	3	**4**	5	**3**	4

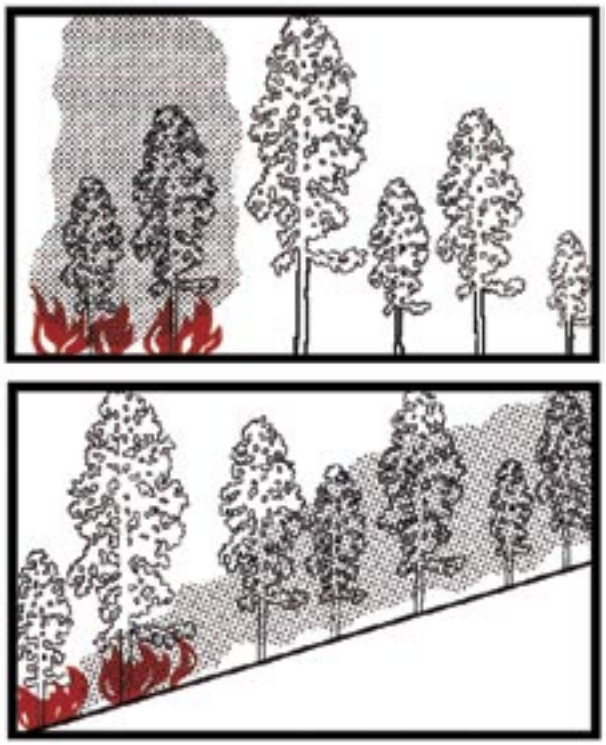
Legend: 5 – Problem may be crucial; 4 – Problem very likely;
3 – Exercise caution; 2 – Problem usually limited;
1 – No rating possible

Wildfire Hazard Maps

The Colorado State Forest Service (CSFS), numerous counties and some National Forests have completed wildfire hazard mapping for many areas within Colorado, particularly along the Front Range. These maps typically consider areas with 30 percent or greater slope; hazardous fuel types; and hazardous topographic features such as fire chimneys. Wildfire Hazard Ratings may be depicted in several ways. Whatever system is used, areas rated moderate or higher should be considered for fuel modification work.

Slope

Rate of fire spread increases as the slope of the land increases. Fuels are preheated by the rising smoke column or they may even come into contact with the flames themselves.



Fire effects, flat vs steep terrain. Note preheating of fuels on steep ground from passage of smoke column.

At 30 percent slope, rate of fire spread doubles compared to rates at level ground, drastically reducing firefighting effectiveness. **Areas near 30 percent or greater slopes are critical and must be reviewed carefully.**

Topography

Certain topographic features influence fire spread and should be evaluated. Included are fire chimneys, saddles, and V-shaped canyons. They are usually recognized by reviewing standard U.S.G.S. quad maps.

• Chimneys are densely vegetated drainages on slopes greater than 30 percent. Wind, as well as air pre-heated by a fire, tends to funnel up these drainages, rapidly spreading fire upslope.

Chimney.

• Saddles are low points along a main ridge or between two high points. Like chimneys, they also funnel winds to create a natural fire path during a fire's uphill run. Saddles act as corridors to spread fire into adjacent valleys or drainages.

Saddle.

• Narrow, V-shaped valleys or canyons can ignite easily due to heat radiating from one side to the other. For example, a fire burning on one side of a narrow valley dries and preheats fuels on the opposite side until the fire "flashes over." The natural effect of slope on fire then takes over and fire spreads rapidly up drainage and uphill along both sides of the valley.

Flashover in V-shaped valley.

Crowning Potential

An on-site visit is required to accurately assess crowning potential. A key, below, helps determine this rating. Fuel modification is usually unnecessary if an area has a rating of 3 or less.

Crowning Potential Key

	Rating
A. Foliage present, trees living or dead — B	
B. Foliage living — C	
C. Leaves deciduous or, if evergreen, usually soft, pliant, and moist; never oily, waxy, or resinous.	0
CC. Leaves evergreen, not as above — D	
D. Foliage resinous, waxy, or oily — E	
E. Foliage dense — F	
F. Ladder fuels plentiful — G	
G. Crown closure > 75 percent	9
GG. Crown closure < 75 percent	7
FF. Ladder fuels sparse or absent — H	
H. Crown closure > 75 percent	7
HH. Crown closure < 75 percent	5
EE. Foliage open — I	
I. Ladder fuel plentiful	4
II. Ladder fuel sparse or absent	2
DD. Foliage not resinous, waxy, or oily — J	
J. Foliage dense — K	
K. Ladder fuels plentiful — L	
L. Crown closure > 75 percent	7
LL. Crown closure < 75 percent	4
KK. Ladder fuels sparse or absent — M	
M. Crown closure > 75 percent	5
MM. Crown closure < 75 percent	3
JJ. Foliage open — N	
N. Ladder fuels plentiful	3
NN. Ladder fuels sparse or absent	1
BB. Foliage dead	0

The majority of dead trees within the fuelbreak should be removed. Occasionally, large, dead trees (14 inches or larger in diameter at 4 1/2 feet above ground level) may be retained as wildlife trees. If retained, all ladder fuels must be cleared from around the tree's trunk.

Ignition Sources

Possible ignition sources, which may threaten planned or existing developments, must be investigated thoroughly. Included are other developments and homes, major roads, recreation sites, railroads, and other possible sources. These might be distant from the proposed development, yet still able to channel fire into the area due to slope, continuous fuels, or other topographic features.

Fuelbreak Locations

In fire suppression, an effective fire line is connected, or "anchored," to natural or artificial fire barriers. Such anchor points might be rivers, creeks, large rock outcrops, wet meadows, or a less flammable timber type such as aspen. Similarly, properly designed and constructed fuelbreaks take advantage of these same barriers to eliminate "fuel bridges." (Fire often escapes control because of fuel bridges that carry the fire across control lines.)

Since fuelbreaks should normally provide quick, safer access to defensive positions, they are necessarily linked with road systems. Connected with county-specified roads within subdivisions, they provide good access and defensive positions for firefighting equipment and support vehicles. Cut-and fill slopes of roads are an integral part of a fuelbreak as they add to the effective width of modified fuels.

Fuelbreaks without an associated road system, such as those located along strategic ridge lines, are still useful in fire suppression. Here, they are often strengthened and held using aerial retardant drops until fire crews can walk in or be ferried in by helicopter.

Preferably, fuelbreaks are located along ridge tops to help arrest fires at the end of their runs. However, due to homesite locations and resource values, they can also be effective when established at the base of slopes. Mid-slope fuelbreaks are least desirable, but under certain circumstances and with modifications, these too, may be valuable.

Fuelbreaks are located so that the area under management is broken into small, manageable units. Thus, when a wildfire reaches modified fuels, defensive action is more easily taken, helping to keep the fire small. For example, a plan for a subdivision might recommend that fuelbreaks break up continuous forest fuels into units of 10 acres or less. This is an excellent plan, especially if defensible space thinnings are completed around homes and structures, and thinning for forest management and forest health are combined with the fuelbreak.

When located along ridge tops, continuous length as well as width are critical elements. Extensive long-range planning is essential in positioning these types of fuelbreaks.

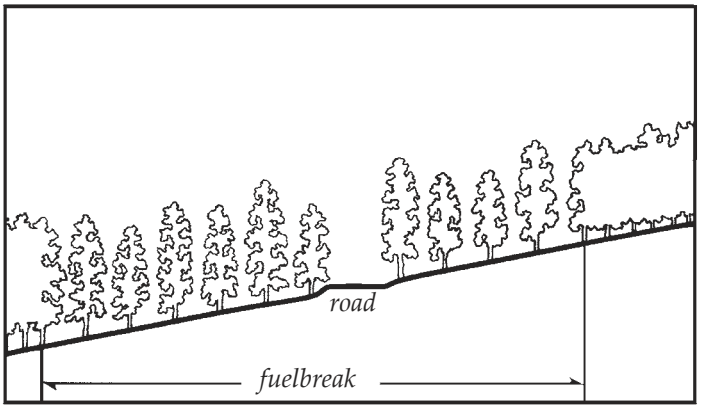
Aesthetics

Improperly planned fuelbreaks can adversely impact an area's aesthetic qualities. Careful construction is necessary when combining mid-slope fuelbreaks with roads involving excessive cut-and-fill.

These photos, far- and near- views of the same site, illustrate that forest can be thinned without impacting aesthetics.

Care must also be taken in areas that are not thinned throughout for fuel hazard reduction. In such cases the fuelbreak visually sticks out like a "sore thumb" due to contrasting thinned and unthinned portions of the forest. (Especially noticeable are those portions of the fuelbreak above road cuts).

These guidelines are designed to minimize aesthetic impacts. However, some situations may require extensive thinning and, thus, result in a major visual change to an area. Additional thinning beyond the fuelbreak may be necessary to create an irregular edge and to "feather," or blend, the fuelbreak thinning into the unthinned portions of the forest. Any thinning beyond the fuelbreak improves its effectiveness and is highly recommended.



Cross-section of a typical fuelbreak built in conjunction with a road.

Constructing the Fuelbreak

Fuelbreak Width and Slope Adjustments

Note: Since road systems are so important to fuelbreak construction, the following measurements are from the toe of the fill for downslope distances, and above the edge of the cut for uphill distances.

The minimum recommended fuelbreak width is approximately 300 feet for level ground. Since fire activity intensifies as slope increases, the overall fuelbreak width must also increase. However, to minimize aesthetic impacts and to maximize fire crew safety, the majority of the increases should be made at the bottom of the fuelbreak, below the road cut.

Widths are also increased when severe topographic conditions are encountered. Guidelines for fuelbreak widths on slopes are given below:

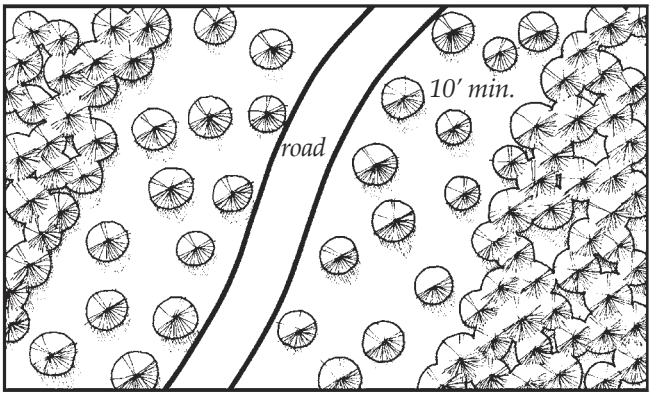
Fuelbreak Width/Slope

Percent Slope (%)	Minimum Uphill Distance (ft)	Minimum Downhill Distance (ft)	Total Width of Modified fuels (ft)*
0	150	150	300
10	140	165	303
20	130	180	310
30	120	195	315
40	110	210	320
50	100	225	325
60	100	240	340

*As slope increases, total distance for cut-and-fill for road construction rapidly increases, improving fuelbreak effective width.

Stand Densities

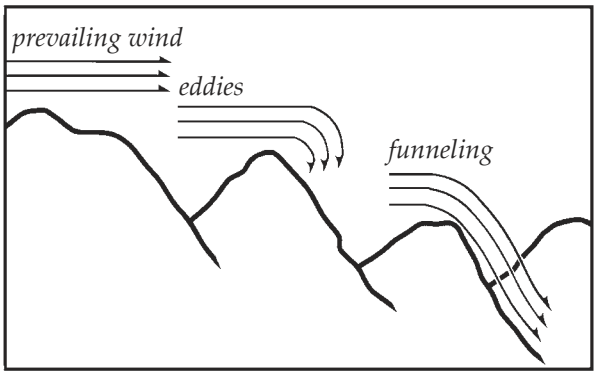
Crown separation is a more critical factor for fuelbreaks than a fixed tree density level. A *minimum* 10-foot spacing between the edges of tree crowns is recommended on level ground. As slope increases, crown spacing should also increase. However, small, isolated groups of trees may be retained for visual diversity. Increase crown spacing around any groups of trees left for aesthetic reasons and to reduce fire intensities and torching potential.



Plan view of fuelbreak showing minimum distance between tree crowns.

In technical terms, a fuelbreak thinning is classified as a heavy "sanitation and improvement cut, from below." Within fuelbreaks, trees that are suppressed, diseased, deformed, damaged, or of low vigor are removed along with all ladder fuels. Remaining trees are the largest, healthiest, most wind-firm trees from the dominant and co-dominant species of the stand.

Because such a thinning is quite heavy for an initial entry into a stand, prevailing winds, eddy effects, and wind funneling must be carefully evaluated to minimize the possibility of windthrow. It may be necessary to develop the fuelbreak over several years to allow the timber stand to "firm-up" — this especially applies to lodgepole pine and Engelmann spruce stands.



Topography affects wind behavior – an important consideration during fuelbreak construction.

Area-wide forest thinnings are recommended for any subdivisions. Such thinning is not as severe as a fuelbreak thinning, but generally should be completed to fuelbreak specifications along the roads (as outlined on page 6.) In addition, "defensible space thinnings" are highly recommended around all structures (see CSU Coop. Extension Fact sheet 6.302, *Creating Wildfire-Defensible Zones*).

Debris Removal

Limbs and branches left from thinning (slash) can add significant volumes of fuel to the forest floor, especially in lodgepole pine, mixed-conifer, or spruce/fir timber types. These materials can accumulate and serve as ladder fuels, or can become "jackpots," increasing the difficulty of defending the fuelbreak during a wildfire. **Slash decomposes very slowly in Colorado and proper disposal is essential.** Proper treatment reduces fire hazard, improves access for humans and livestock, encourages establishment of grasses and other vegetation, and improves aesthetics.

Three treatment methods are commonly used. These are lopping-and-scattering, piling and burning, and chipping. Mulching of small trees and slash using equipment similar to Hydro-axes or Timbcos equipped with mulching heads are becoming a popular method of treatment. Size, amount, and location of slash dictates the method used, in addition to cost and the final desired appearance. The method chosen will also depend on how soon an effective fuelbreak is needed prior to construction in new developments.

Lop and scatter: slash should be no deeper than 12'' above ground surface.

Chipping is the most desirable, but also the most expensive method of slash disposal.

Piled slash can be burned but only during certain conditions, such as after a snowfall.

Fuelbreak Maintenance

Following initial thinning, trees continue to grow (usually at a faster rate). The increased light on the forest floor encourages heavy grass and brush growth where, in many cases, where little grew before. The site disturbance and exposed mineral soil created during fuelbreak development is a perfect seed bed for new trees that, in turn, create new ladder fuels. Thus, in the absence of maintenance, fuelbreak effectiveness will decrease over time.

Fuelbreak maintenance is essential. Ingrowth, shown above, will minimize the effectiveness of this fuelbreak within a few years.

Fuelbreak maintenance problems are most often the result of time and neglect. Misplaced records, lack of follow-up and funding, and apathy caused by a lack of fire events are some of the major obstacles. In addition, the responsibility for fuelbreak maintenance projects is often unclear. For example, control of a fuelbreak completed by a developer passes to a homeowner's association, usually with limited funds and authority to maintain fuelbreaks.

If fuelbreak maintenance is not planned and completed as scheduled, consider carefully whether the fuelbreak should be constructed. An un-maintained fuelbreak may lead to a false sense of security among residents and fire suppression personnel.

Conclusion

An image of well-designed communities for Colorado includes:

• Forested subdivisions where the total forest cover is well-managed through carefully planned, designed, and maintained thinnings. This contributes to reduced wildfire hazards and a much healthier forest — one that is more resistant to insects and disease.

• A system of roads and driveways with their associated fuelbreaks that break up the continuity of the forest cover and fuels. These help keep fires small, while also providing safer locations from which to mount fire suppression activities. In addition to allowing fire personnel in, they will allow residents to evacuate if necessary.

• Individual homes that all have defensible space around them, making them much easier to defend and protect from wildfire, while also protecting the surrounding forest from structure fires.

Creation of such communities is entirely feasible if recognition of the fire risks, a spirit of cooperation, an attitude of shared responsibility, and the political will exists.

Colorado's mountains comprise diverse slopes, fuel types, aspects, and topographic features. This variety makes it impossible to develop general fuelbreak prescriptions for all locations. ***The previous recommendations are guidelines only.*** *A professional forester with fire suppression expertise should be consulted to "customize" fuelbreaks for particular areas.*

Appendix F

National Wildfire Coordinating Group (NWCG)

Safety Zone Guidelines

And

LCES Checklist

Safety Zone Guidelines

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

CALCULATIONS ASSUME NO SLOPE AND NO WIND

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

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

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

LCES Checklist

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

Lookout(s)

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

Communication(s)

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

Escape Route(s)

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

Safety Zone(s)

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

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

Appendix G

Permission for Property Use During a Declared Emergency (Sample)

Permission for Property Use During A Declared Emergency

During a Douglas County wildfire incident impacting Hidden Village, use of Hidden Village Property Owners Association (HVPOA) property by professional emergency personnel may be required for emergency or fire fighting activities. Emergency uses would include any or all of the following activities: mechanical fuel mitigation, firing of vegetation, fire fighting staging activities, emergency materials and supplies storage, surface water access and usage, establishment of a temporary heliport, or other usage appropriate to resolving the emergency situation at hand. For an emergency impacting HVPOA and requiring HVPOA land use for fighting or resolving the emergency, the HVPOA board has pre-approved and granted property use permission to the emergency event incident commander.

The property use permission document should be signed by the HVPOA board members and should be included in this Community Wildfire Protection Plan as an annual update to the CWPP. The pre-approval/property emergency-use authorization will be updated annually at the time of the annual Community Wildfire Protection Plan review and update. The aforementioned, signed emergency property-use authorization document will be provided for filing with the Douglas County Emergency Services Director, Colorado State Forest Service (Franktown District), and the South Metro Fire Rescue Authority District Chief.

DECLARED-EMERGENCY USAGE PERMISSION
For
Hidden Village Property Owners Association

This document authorizes emergency resolution use of Hidden Village Property Owners Association (HVPOA) property in the event of a Douglas County emergency event impacting the community of Hidden Village or its surrounding area. This authorization is granted to the incident commander of the emergency for usage by professional emergency agencies and their personnel.

HVPOA Property Description or Designation Usage Authorized:

Section 1: (This area will list the legal descriptions of all HVPOA-owned land parcels, if available)

Approved Emergency Usage Activities Authorized:

1. Fuel Mitigation
2. Firing
3. Staging, Storage and/or Emergency Management Activities
4. On-Site Water Usage
5. Ancillary use as deemed appropriate by the Incident Commander or the Douglas County Emergency Services Director

This document is duly signed and grants permission for the above described use of HVPOA owned property during an emergency by firefighting and emergency personnel under the command of the emergency incident commander.

Signed this ___ day of _____, _____ by Hidden Village Property Owners Association Board of Directors:
(number) (month) (year)

_____ _____ _____
President Vice President Secretary

_____ _____
Treasurer Assistant Secretary

Appendix H

Colorado State Forest Service

Standards for

Community Wildfire Protection Plans (CWPP)

Appendix H
Colorado State Forest Service
Minimum Standards for Community Wildfire Protection Plans (CWPP)

1. **Participants**
   - The core planning team must include local government, local fire authority, local CSFS representative and representatives of relevant federal land management agencies.
   - Planning activities that involve assessing community risks and values, identifying community protection priorities, or establishing fuels treatment project areas and methods MUST involve diverse representation from interested non-governmental stakeholders.

2. **Plan Components**
   - Community Wildfire Protection Plans must included the following components:
     - o A definition of the community's wildland-urban interface (WUI), preferably outlined on a map with an accompany narrative.
     - o A discussion of the community's *preparedness* to respond to wildland fire.
     - o A community risk analysis that considers, at a minimum, fuel hazards, risk of wildfire occurrence and community values to be protected – both in the immediate vicinity and in the surrounding zone where potential fire spread poses a realistic threat.
     - o Identification of fuels treatment priorities, including locations on the grounds and preferred methods of treatment.
     - o Recommendations regarding ways to reduce structural ignitability.
     - o An implementation plan.

3. **Level of Specificity**
   - A CWPP may be developed for any level of "community," from a homeowner's association or mountain town to a county or metropolitan city.
   - Information contained in the plan should be at a level of specificity appropriate to the size of the community being addressed. For example, data used to develop a community risk analysis or identify fuels treatment priorities for a small town would need to be at a finer scale than that used for a county.
   - County level plans can be used as an umbrella for plans in smaller communities, but should not be considered a substitute. A county plan will not provide the detail needed for project level planning.

4. **Adapting Existing Plans and Combining Related Plans**
   - If a community has an existing plan that already meets the majority of the CWPP criteria, it is preferable to work with the community to adapt that plan to meet the remainder of the criteria. However, plan adaptations must be collaborative as described in (1) above and include stakeholder representation. This is particularly important if the adaptation involves establishing fuels treatment priorities.
   - Communities are encouraged to combine CWPPs with related documents such as FEMA All-Hazard Mitigation Plans where appropriate.

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* Minimum standards are to be used in combination with the nation publication titled, "Preparing a Community Wildfire Protection Plan: A Guide for Wildland Urban Interface Communities." Maximum flexibility should be sought in meeting individual community needs.

November 18, 2004

The Hidden Village Community Wildfire Protection Plan was collaboratively developed. Interested parties, including Hidden Village homeowners, South Metro Fire Rescue Authority, Douglas County Public Works, Douglas County Wildfire Mitigation Staff, Douglas County Emergency Management, and the Colorado State Forest Service, participated and provided input to the process.

The CWPP identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect Hidden Village. It also recommends measures to reduce the ignitability of structures throughout the area.

The following community representatives/agencies have reviewed and support this Community Wildfire Protection Plan.

Sharon Culbertson
Hidden Village POA 11-17-08

11/24/08
South Metro Fire Rescue Authority

11-17-08
Colorado State Forest Service
Franktown District