

# Community Wildfire Protection Plan

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Prepared For

Woodmoor Mountain  
Homeowners Association

By

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# Table of Contents

	<u>Page</u>
Preface, <b>INTRODUCTION AND ACKNOWLEDGEMENTS</b> .....	4
Chapter 1, <b>EXECUTIVE SUMMARY</b> .....	5
Chapter 2, <b>GOALS, PLAN COMPONENTS AND ON-GOING MAINTENANCE OF PLAN</b> .....	8
• Goals and Objectives	
• Plan Components	
• Maintenance of the CWPP	
Chapter 3, <b>BACKGROUND AND HISTORY</b> .....	10
• Geographic and Ecological Location	
• History of Woodmoor Mountain, LFPD	
• Wildland Interface Impact Areas	
• Wildfire History	
Chapter 4, <b>WILDFIRE HAZARD ASSESSMENT</b> .....	16
• Methodology and Strategies	
○ Identification and Prioritization of Potential Fire Breaks on HOA Lands	
○ Compartment Locating and Project Labeling	
○ Three Proposed Mitigation Strategies	
• Proposed Wildfire Fuel Break Areas	
○ Location	
○ Fuel Reduction Project Prioritizations	
○ Types of Mitigation Used for Projects	
○ Scheduling	
Chapter 5, <b>EMERGENCY EGRESS</b> .....	22
Chapter 6, <b>SERVICES INFRASTRUCTURES, WILDLAND FIRE RESPONSES</b> .....	26
• Professional Wildland Fire Response Services	
○ Douglas County Emergency Services	
❖ Hazard Response Plan	
○ Larkspur Fire Department	
❖ Fire Response Plan	
❖ Water Resources and Safety/Staging Areas	
❖ Emergency Medical Services	
• Internal Volunteer Services and Communication	
• Egress and Ingress Routes / Evacuation	
• Street Signage and Sight Distances at Intersections	
• Critical Utilities	
○ Electrical Power – <i>Intermountain Rural Electric Association</i>	
○ Natural Gas – <i>Aquila</i>	
○ Water Supply	
○ Wire-line Telecommunications – <i>Qwest</i> and <i>Comcast</i>	
• Post Fire Remediation	

Chapter 7, <b>PUBLIC NOTIFICATION, COMMUNICATION AND SUPPORT</b> .....	33
• Warnings and Hazard Notifications to the General Public	
• Services Communications and Support Systems	
○ Non-threatening Conditions	
○ Wildfire Condition	

Chapter 8, <b>IMPLEMENTATION PLAN</b> .....	34
• Public Education	
• Fuels Treatment	
• Support Systems	

## APPENDICES

A. CWPP Compartments and Sub-compartments.....	
B. Senate Bill SB-100.....	
C. Fire Hazard Classes and Fuel Models.....	
D. Evaluation and Monitoring Sample Form .....	
E. Firewise Household Tips and Property Mitigation and Protection.....	
F. Permission For Homeowners Association Property Use.. .....	
G. Fuel Break Guidelines for Forested Subdivisions.....	
H. CSFS Minimum Standards for Community Wildfire Protection Plans.....	

**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.

## **Preface**

The Woodmoor Mountain Fire Plan Working Group, in concert with the Larkspur Fire Protection District and the Colorado State Forest Service, is dedicated to the development of a strategic Community Wildfire Protection Plan (CWPP) for the protection of life, property and natural resources both in and around the Woodmoor Mountain Home Owners Association. This plan follows Healthy Forest Restoration Act (HFRA) and Colorado State Forest Service criteria. The HFRA mandated that all Wildland-Urban Interface (WUI) communities shall formulate a CWPP in order to qualify for assistance.

This process has involved stakeholders at the local, county, state and federal levels. The plan will also serve as a guide to federal agencies by identifying WUI areas within the plan that will be given priority for future fuel treatments as funds may become available.

The Woodmoor Mountain Fire Plan Working Group strives to assist local residents in taking a lead in our fire planning efforts. Our intention is to acknowledge and catalyze every citizen's responsibility for fire safety while creating grassroots community buy in, and a sense of ownership driven by empowerment. This is done by creating guidance for basic fire planning, identifying access to information and tools, and providing service and support needed for a successful plan.

The Working Group is cooperating with Larkspur Fire Department and Colorado State Forest Service to allow for improved firefighter safety should they be called upon to assist the community. The CWPP process established critical partnerships that will allow for implementation of the plan, as well as identifying long-term needs for wildfire protection.

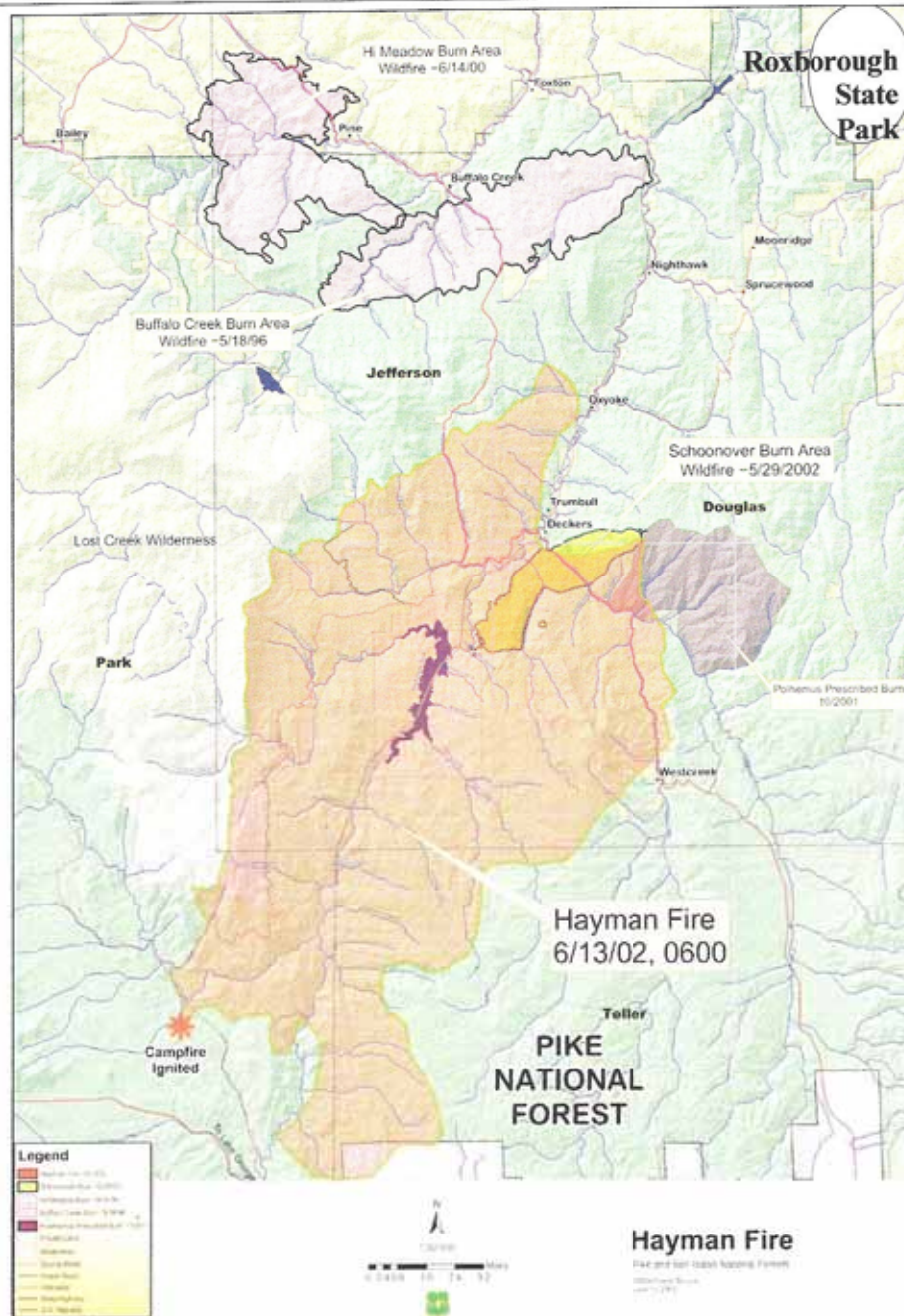
## EXECUTIVE SUMMARY

The Woodmoor Mountain Community Wildfire Protection Plan (CWPP) is sponsored by the Woodmoor Mountain Home Owners Association (WMHOA) for the safety of life and protection of property in Woodmoor Mountain neighborhoods and their immediate vicinity. Participation in the establishment of this CWPP was a broad stakeholder group including Colorado State Forest Service (CSFS), Larkspur Fire Protection District (LFPD), USDA Forest Service (USFS), and Douglas County Office of Emergency Management (DCOEM). Development of this CWPP focused primarily on wildfire hazard identification, fuel mitigation and emergency response. The fuel mitigation focused on specific wildfire risk areas with heavy fuel densities and terrains that could be used for protection and wildfire prevention advantage, coupled with close attention paid to upholding ecological values. Wherever possible, other values such as wildlife habitat enhancement, forest health restoration, improved aesthetics and increased property values will be factored in.

The Woodmoor Mountain area is no stranger to wildfires and the need for wildfire prevention and protection. The proximity 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!*” (See Figure 1, Wildfire History) In 2002, the WMHOA 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 WMHOA has been guided by a committee of concerned residents of the community that formed the Woodmoor Mountain Fire Plan Working Group (FPWG) to advise the Woodmoor Mountain Homeowners Association Board of Directors. Some of the committee members have worked in the past with LFPD and CSFS personnel to address the wildfire issue on their individual properties.

The community has two 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 Pike National Forest (Pikes Peak Ranger District) to the west, DC Road 105 (Perry Park Road) to the east, Valley Park to the north and Palmer Lake to the south.

With this CWPP, care was taken to propose and provide mitigation within the neighborhoods to provide fuel breaks to lower the risk of spreading wildfire and to protect residents from potential wildfire intrusion from the various risk sections of the adjoining WUI. Twenty-six areas with varying degrees of mitigation were identified within the community. 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.



**Map 1:** Since 1996, four large fires have grown to within ten miles of Roxborough State Park's boundaries. <<http://www.fs.fed.us/r2/psicc/hayres/maps/index.htm>>

**Figure 1, Wildfire History**

Four primary strategies are employed to achieve mitigation: 1) Providing fuel mitigation treatment to HOA owned land and critical private parcels; 2) Encouragement and support of private land owners doing their own wildfire fuel mitigation; 3) Working with the LFPD and other stakeholder agencies to require developers of stand-alone, undeveloped areas within zones surrounding the HOA's to mitigate their land before building occurs; and 4) support of on-going fuel and future treatment projects on USFS 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 WMHOA. Douglas County Sheriff's Office, represented by DCOEM, in conjunction with LFPD has the primary responsibility for protecting life and property in the WMHOA in the event of a wildfire incident. If a wildfire event is beyond LFPD resource capability, the DCOEM (inclusive of LFPD) is party to a mutual aid agreement for support from other Douglas and El Paso County fire departments.

The WMCWPP 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 development locations and densities will be reviewed annually and used in scheduling fuel mitigating events. 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 Woodmoor Mountain HOA Board of Directors and FPWG Committee. Each individual project identified within this plan has a measured baseline; i.e., current condition description of its "*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 review the progress of the CWPP and receive public input.

## **GOALS, PLAN COMPONENTS & ON-GOING MAINTENANCE OF PLAN**

### **Primary Purpose**

The WMCWPP was developed for the safety of life and protection of property from wildfire emergencies within the boundaries of the HOA 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 Woodmoor Mountain Wildfire Protection Plan 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, county, state and federal 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 WMHOA for wildfire hazard(s) mitigation and response related projects.

#### *Administration and Plan Maintenance:*

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

### **Plan Components**

The WMCWPP 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 WMHOA 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 WMCWPP 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 WMCWPP is meant to be a “*living document*” which is updated periodically to assure currency in both wildfire prevention and planned response to wildfire situations both in HOA’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 FPWG 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 WMHOA’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 HOA budgets for the following year.

Between the aforementioned FPWG Committee meeting and the formal updating of the CWPP each year, the HOA board or its representative(s) will meet with key stakeholders representing primary professional forest management, fire prevention and emergency services management to review proposed CWPP changes and updates. Once the WMHOA board and the key stakeholders are in agreement to the proposed changes and updates to the WMCWPP, those changes and updates will be available for public perusal and comment; either at a pre-announced public meeting or through the HOA website.

Formal CWPP evaluation will be done in conjunction with LFPD 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.

Lessons learned from monitoring and data collection will be useful for modifying project plans to better meet WMCWPP goals and objectives.

## BACKGROUND AND HISTORY

### Geographic and Ecological Location

Woodmoor Mountain is an 800 acre Rocky Mountain Foothills' community located approximately seven miles southwest of Larkspur and five miles north of Palmer Lake, Colorado (see Figure 1, Vicinity Map). Located approximately 40 miles from downtown Denver to the northeast, Woodmoor Mountain's major residential development started in 1971. It has grown to a current configuration of 55 homes. Full build-out of Woodmoor Mountain has the potential of 150± homes.

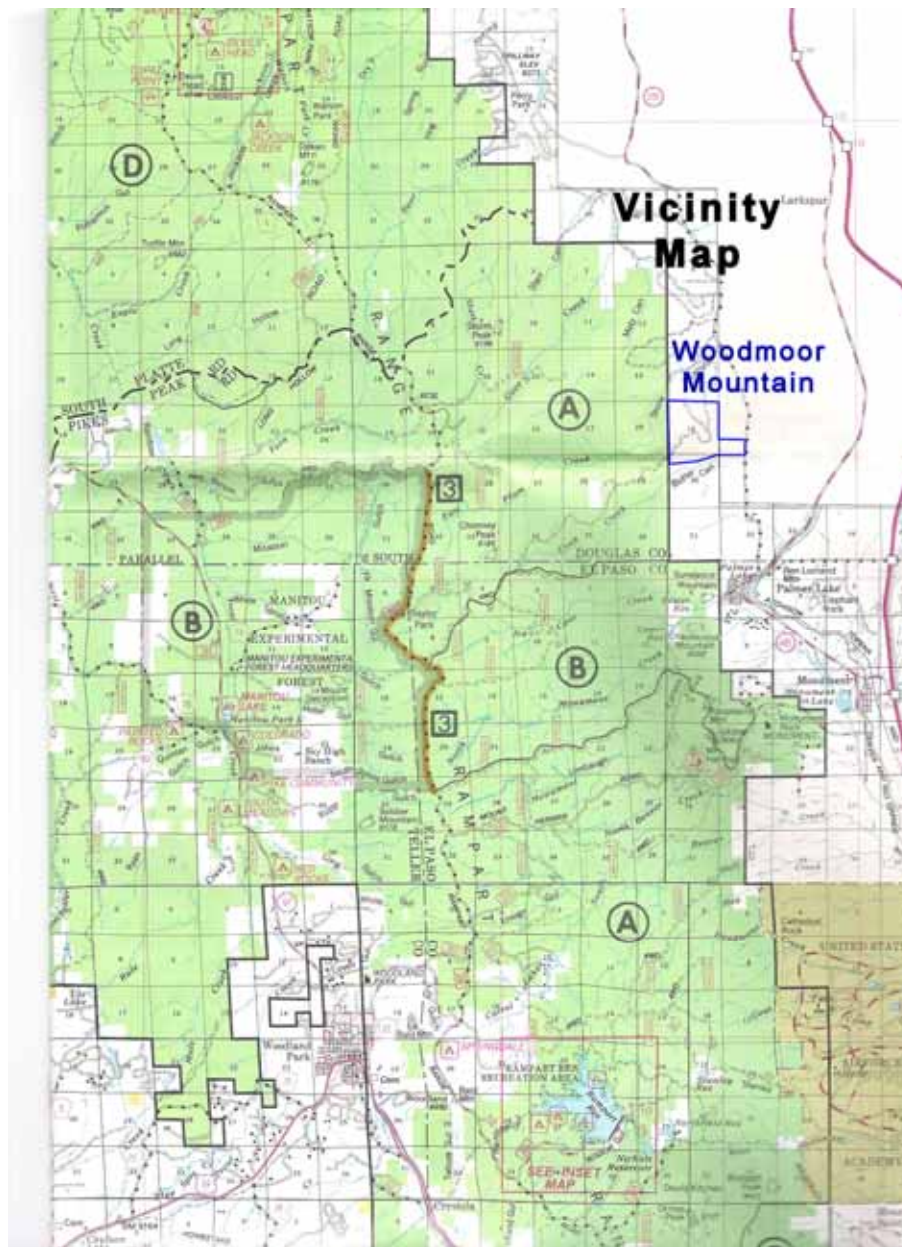


Figure 2. Vicinity Map

Woodmoor Mountain is a classic wildland urban interface community abutting the Pikes Peak Ranger District of the Pike National Forest on the west, and surrounded by private lands on three sides to the south, east and north of the community. To its east, Woodmoor Mountain slopes downward to high elevation prairie terrain. Woodmoor Mountain's average elevation is approximately 7,500 feet, varying greatly from gentle zero to fifteen percent slopes associated with its eastern grasslands (7,000 feet) to more extreme slopes of thirty to one hundred percent in its western areas. Vegetation consists of dense stands of Gamble oak, ponderosa pine and Douglas-fir and prairie grasses.

### **History of Woodmoor Mountain**

The area within the boundaries of Woodmoor Mountain is predominantly historic timber lands as part of early ranching and logging in the area. The area was first visited by the Stephen Long expedition in 1820. Heavy logging is evident given the presence of old skid trails and logging stumps. Several old logging trails wound their way into the community from the foothills to the west. 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. Wildfires have been suppressed over the past 100 years. The Woodmoor Mountain community, created in the early 1970's, has grown steadily with significant in-fill growth taking place over the last ten years.

The WMHOA was established at the beginning of the residential community and serves as the governing body for the community. The Fire Plan Working Group (FPWG) was formed in 2006 to assist the board of directors in making the community more fire resistant. A number of large, landscape scale fires had occurred in the South Platte Watershed west of the community since 1996. The area is very prone to lightning caused fires. Woodmoor Mountain was evacuated by the 138,000 acre Hayman Fire of 2002.

WMHOA maintains a yard-waste and slash disposal program for all residents. Material is collected at several central locations and processed at least once per season. The community has received small grants within the past five years to address wildfire issues. The WMHOA recently began budgeting funds annually for fire mitigation. In 2006, the WMHOA budgeted funds to develop its Community Wildfire Protection Plan (CWPP). A professional forester was engaged to complete the plan in April 2007.

Transportation planning has been an on-going function of the WMHOA. Access within the majority of the community is facilitated by Mountain Ranch and Cook Creek Roads. Both are steep, between 8 and 14 percent grades with short segments of 5 percent or less. Both roads meander through the community until they intersect with tree spur roads that approach the summit of Blue Grouse Ridge in the west central part of the community. Elk Park, Badger, lower Mountain Ranch and Deer Ridge Way are spur roads that dead end less than 500 yards from their points of origin. All access roads within the community have a natural gravel surface and are constructed for two-way traffic (at least 18-20 feet wide). There are a number of places for large vehicles to turn around throughout the community.

All roadways within the community are owned and operated by WMHOA. Maintenance funding is provided through a "share-back" agreement with Douglas County (GID Funds). WMHOA owns its own motor-grader for routine maintenance. The gated entrance is accessible by LFPD at all times through a "Knox Lock" controlled key or emergency code. Emergency access for both ingress and egress will be discussed in Chapter 5.

The complete transportation network for Woodmoor Mountain was never completed due to a bankruptcy of the original developer. This resulted in the loss of lands necessary to complete alternate ingress/egress routes for the community. Discussions have been on-going with Douglas County and developers of adjacent lands to obtain alternate emergency egress routes.

The South Platte Watershed has been severely impacted by wildfire over the past ten years. The Front Range Fuel Treatment Partnership, a multi-agency group, was formed and funded to implement major fuel treatments in the watershed. Numerous fuel treatments are planned for areas northwest of Woodmoor Mountain along Rampart Range Road. The area immediately west of the community is considered “Roadless Area” and will be constrained by Federal regulations. All projects are subject to funding and staffing limitations.

### **Wildfire History**

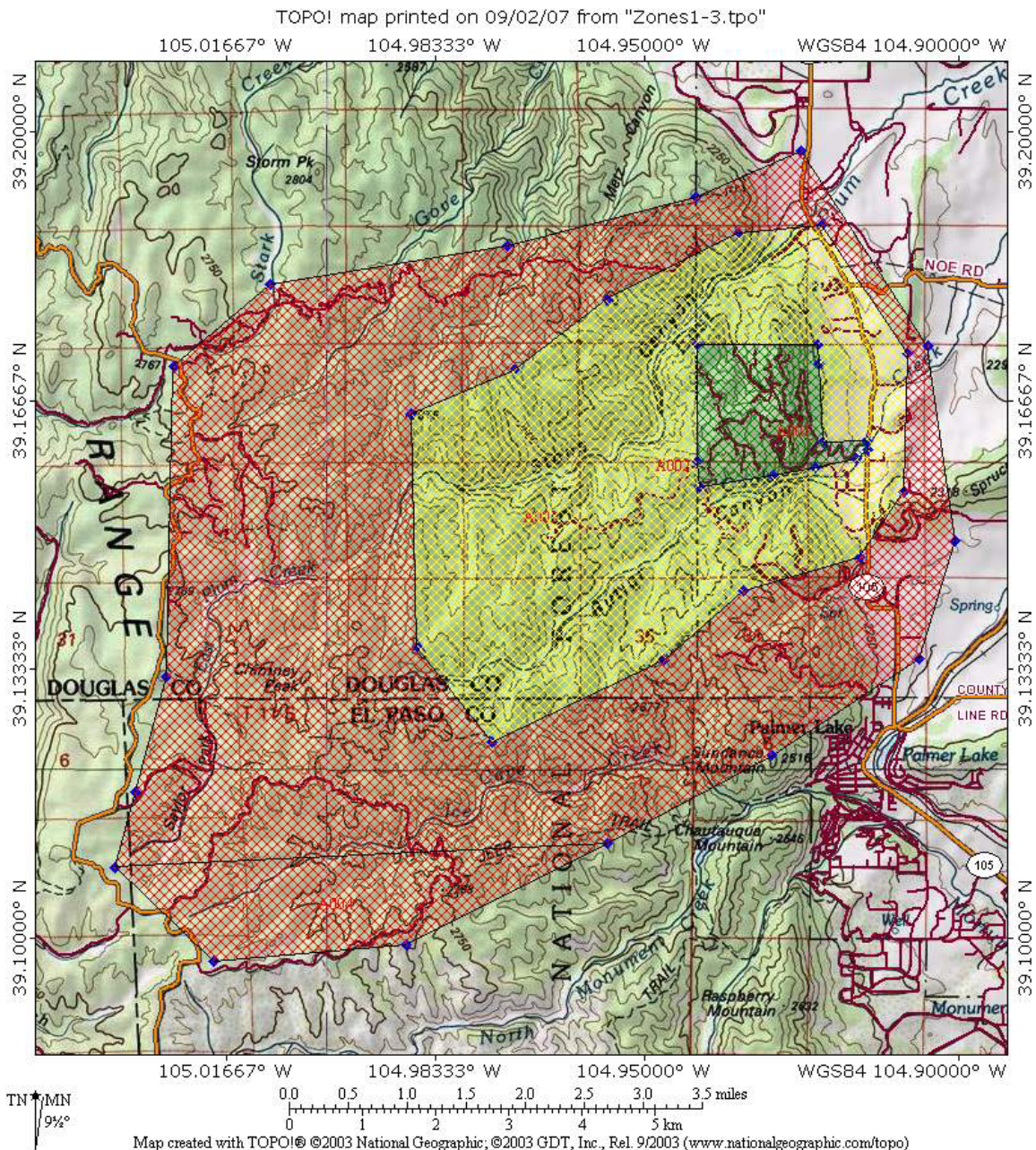
Over the past decade, Woodmoor Mountain has escaped all major wildfires in its proximity. The Hayman Fire of 2002 came within five miles of the community. The 138,000 acre, human started Hayman Fire of 2002 had a significant impact on the community; even though climatic events and fire fighting efforts held it within five miles west of Woodmoor Mountain. During the height of the Hayman Fire, the fire’s *Incident Command* evacuated the community for the safety of its residents; consequently, the Hayman Fire had and has left a lasting impression on the residents.

### **Wildland Urban Interface (WUI) Impact Areas**

With the high potential of ground lightning ignition and recreation related fire starts, the Pike National Forest lands west of Woodmoor Mountain present the greatest catastrophic wildfire threat to the residential areas. Lands to the west consist of very steep terrain and large expanses of untreated fuels. It should be remembered that wildfires can also spread from the community into the surrounding areas. Human caused ignitions on private lands have the potential to burn into the National Forest.

The WUI for Woodmoor Mountain was set after meeting with local, state and federal fire officials. These are shown on Figure 3. WUI Zones. These units were set to aid state and federal agencies in targeting planning and funding for areas within one mile of wildland interface communities like Woodmoor Mountain.





**Figure 3. Woodmoor Mountain WUI Zones**

## Zone 1

Zone 1 is Woodmoor Mountain shown in Figure 4. It consists of the community and is approximately 800 acres in size. The WMHOA owns approximately 50 acres as common area and right-of-ways.

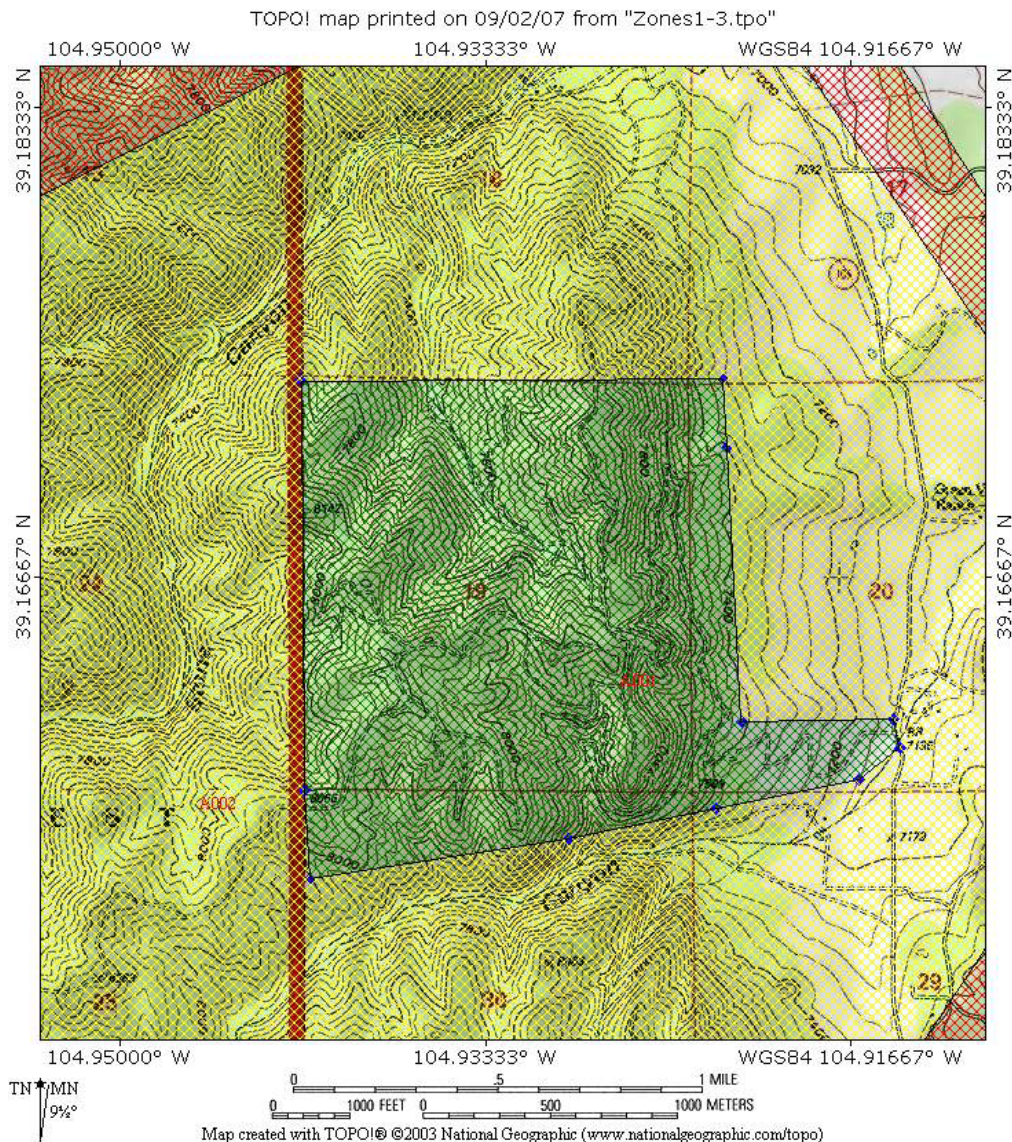
Fuel treatment projects have been on-going on private lots since 2002. Homeowners and property owners have been encouraged to implement Firewise guidelines around all structures through educational efforts of the WMHOA, LFPD and Colorado State Forest Service.

In the past, removal of trees and vegetation was strictly controlled by the Architectural Control Committee under the WMHOA 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 are 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 an amended version of NFPA-299 as a guideline. More specific wildfire mitigation planning for Zone 1 is covered in Chapter 4.



**Figure 4 Woodmoor Mountain, Zone 1**

## Zone 2

Zone 2 is the adjoining Wildland Urban Interface. The major owners within this zone are private owners and USDA Forest Service (Pike National Forest). This area covers all lands around Woodmoor Mountain. The western boundary of this zone was set based on estimated fire

behavior of watershed or landscape scale fires. At the present time, no fuel treatments are planned in this zone due to steep terrain and diverse ownerships.

Pike National Forest lands will be difficult to treat in Zone 2. Access will be limited to existing roads or trails due to "Roadless Area" designation. This may involve a time consuming and expensive process as mandated under NEPA (National Environmental Protection Act). If any threatened or endangered species are found within the area, additional layers of Federal regulations will apply. Areas directly abutting Woodmoor Mountain may qualify for "categorical exclusion status" if no major issues arise. No fuel treatments are currently planned in this zone.

Individual owners who abut National Forests can work with the Colorado State Forest Service to help facilitate privately funded mitigation efforts on USFS property, through a "Good Neighbor" agreement, supervised by CSFS personnel and coordinated with Pikes Peak Ranger District Staff.

### **Zone 3**

Zone 3 is the extended area in which watershed and landscape scale wildfires will pose a risk to the community. The western boundary is generally west of Rampart Range Road and extends south to the area west of Palmer Lake. The Front Range Fuel Treatment Project has targeted the area for high priority treatment due to impacts to water quality in the South Platte Watershed. Unfortunately, a high percentage of lands within Zone 3 are inaccessible or inoperable for treatment.

### **Zone Totals**

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

Zone 1- 800 acres  
Zone 2- 7,680 acres  
Zone 3- 23,040 acres

Note: All Zone 2 and 3 boundaries and acreages are approximate and are intended as a guide only.

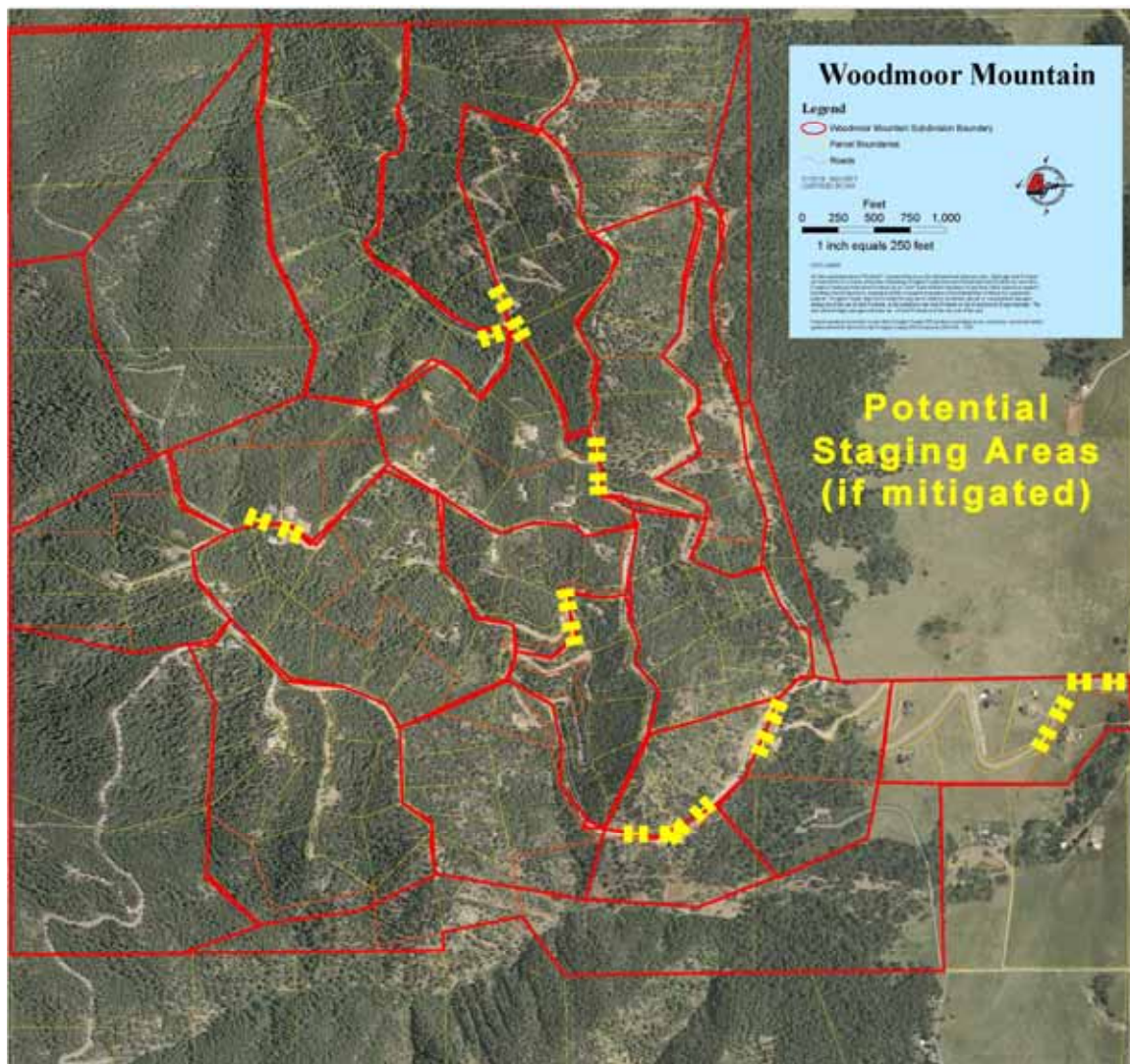


## WILDFIRE HAZARD ASSESSMENT

This section of the Community Wildfire and Protection Plan addresses the identification and the prioritization of fuel mitigation treatments for high risk wildfire hazards impacting Woodmoor Mountain as well as a brief assessment of vegetation fuels currently within the proposed fuel treatment areas.

### Methodology and Strategies

The developed portion of Woodmoor Mountain contains four potential "refuge zone" or staging areas for more orderly evacuation and ingress of fire fighting resources. The Mountain Ranch Drive roadway at the entrance to the community off DC-105 (Perry Park Blvd.) is the only refuge zone currently considered usable. These are shown in Figure 5.



**Figure 5, Potential Staging Areas**



Two primary decision considerations were used in the methodology for identifying potential fuel breaks within the developed areas of Woodmoor Mountain: established road (both paved and rough) rights of way, and “connections”. For proposed fuel treatments tying to roads, mitigation widths of forty (40) feet were considered for ease of use since that footage corresponded with road rights of way; i.e., twenty (20) feet either side of the centerline of the designated road. It should be noted that the 40 feet is for ease in assisting quicker access since it corresponds with most road rights of way. It should also be noted that negotiations should be undertaken 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 G). For ease of planning in this Community Wildfire Protection Plan, wildfire fuel breaks in unimproved areas such as ground trails or across solid stands of vegetation, were also preliminarily considered to be sixty feet wide for ease in estimating acreage and costs in these areas prior to baseline data studies of each of the areas. The length of the proposed fuel treatment, coupled with the width of the fuel treatment and 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 was added to the acreage to account for measurement discrepancies.

“Connection” is a term for wildfire fuel treatments that used to describe fuel treatments that “connect” natural areas with light or no fuel content (e.g., rock ridges, riparian, etc.) or fuel treatments that “connect” more widespread thinned areas that have already had potential wildfire fuels mitigated. “Connection” breaks were proposed in areas of heavy home development/structures to assist in home area protection without destroying the environmental esthetics of the area. (See Appendix G, *Fuelbreak Guidelines for Forested Subdivisions*, for descriptions and rationale for building fuel breaks.)

For undeveloped areas within Woodmoor Mountain, such as specific areas within dense, untreated forests, potential mitigation would cover a much broader expanse of land than the wildfire fuel treatments considered for protecting developed properties. An example of fuel treatments proposed by this plan is shown in Figure 6.



**Figure 6, Sample fuel treatment done on USFS lands.**

### Compartment Locating and Project Labeling

This Community Wildfire Protection Plan divides Woodmoor Mountain into 26 compartments, utilizing Douglas County GIS Department mapping and lot layout. Within each compartment, “*connection*” fuel treatments are prioritized by wildfire impact risk and assigned a label, identifying the compartment area, and the mitigation priority. The fire hazard class will use the five-classifications used by the Colorado State Forest Service (See Appendix C, *Fire Hazard Classes and Fuel Models*).

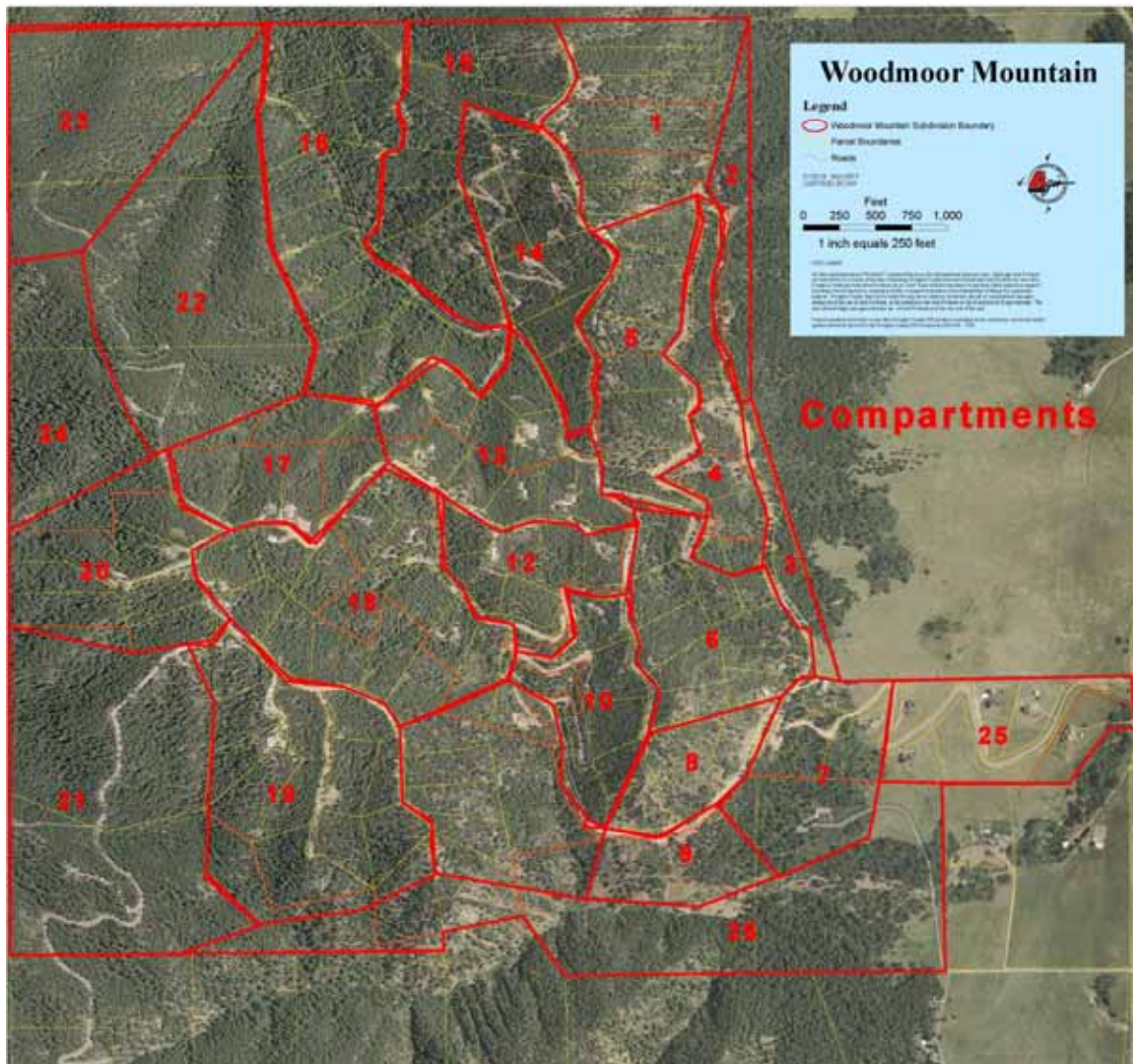


Figure 7. Compartments

### Three Proposed Mitigation Strategies

The WMCWPP 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 Way and WMHOA Land

For properties on which WMHOA possesses rights of way or on properties directly owned by WMHOA, mitigation work will be funded by WMHOA. This funding will either come from direct funding or through State or Federal grant monies applied for and received by WMHOA.

#### Private Homeowner and Landowner Properties

WMHOA neither has auspices nor declaration of use of private properties within its boundaries. Therefore, fuel mitigation on private properties, although highly encouraged by the WMHOA and LFPD, is the responsibility of the property owner. However, WMHOA will provide information and services to assist property owners in their mitigation efforts. This information and services will consist of references, Firewise planning details and planning guides, occasional Firewise training classes, a mitigation slash pile disposal site, and periodic provision of free mulch (See Appendix E, *Firewise Household Tips, Property Mitigation and Protection*).

In private lands adjacent to WMHOA land or a road right of way that has had fuel mitigation performed to form a fuel treatment, owners are encouraged to work with WMHOA in “feathering” the mitigated fuel treatment into their private property to attain a wider fuel treatment as specified by Colorado State Forest Service (See Appendix C, *Fire Hazard Classes and Fuel Models*).

#### Undeveloped, Publicly-owned Properties

WMHOA will work with State and Federal service agencies to encourage adjacent property owners to treat lands adjacent to Woodmoor Mountain that pose a threat to structures and public safety. The WMHOA should strongly encourage the Douglas County Board of County Commissioners to enact ordinances to require property owners and land developers to *pre-mitigate* fuels on high risk wildfire properties to be developed. This *mitigation* is envisioned to be required prior to allowing the building of structures to proceed (See Chapter 8, *Implementation Plan*). There appears to be some degree of acceptance of developers to this community protection strategy since some developers have agreed in principle and have indicated such to the LFPD. Both the WMHOA and LFPD will work to assess potential in-fill areas that may be planned in these currently undeveloped but prime focus areas (See Chapter 8, *Implementation*).

### **Proposed Wildfire Fuel Treatment Areas**

As indicated at the beginning of this chapter, Woodmoor Mountain is divided into compartments for the process of locating and defining potential wildfire fuel treatment needs. This information is shown below using compartment maps for the reader to reference and detailed on a compartment by compartment basis using the two character numeric label (as specified in the second paragraph of this chapter) to designate project location, specific fuelbreak, and mitigation priority. Also shown is the location description, estimated mitigation acreage of the proposed fuel break and broad, estimated cost of the project. By using the maps, the reader should also be able to gain a sense of how fuel treatments were laid-out to develop fire limiting sub-compartments within the community.

### **Fuel Reduction Project Prioritization**

The risk priority associated with each of the mitigation projects proposed in this plan was established by basing the decision in consideration of 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 National forest land, fine fueled grassland or privately owned land (Buffer zoning);
- 5) Wildfire characteristics of each area learned from fire modeling experience;
- 6) Area presenting early 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 G, *Fuelbreak Guidelines for Forested Subdivisions*, care will be closely given to assure environmental aesthetics of the immediate and surrounding area of mitigation projects.

### Vegetation Analysis

Current analysis of the density and varieties of vegetation is an integral part of deciding when to schedule projects. The aerial digital map below depicts the vegetation in Woodmoor Mountain and its surrounding wildland urban interface from a 2004 photo flyover. Due to its age, it needs to be updated with the latest flyover information prior to final scheduling of a mitigation project. If no significant changes have occurred, then no updating is needed. Vegetation mapping has been kept simple and follows established Colorado State Forest Service Fuel Mapping categories. These will be augmented by USDA Forest Service **National Fire Danger Rating System (NFDRS) designations** (General Technical Report INT-39).

NOTE: The CSFS fuel rating is not a currently accepted fuel modeling system. It is used here to simplify fuels for persons with no background or exposure to more complicated fuels classifications. The old CSFS system using X, A, B, and C is very simplified, but adequate for homeowners and community leaders to make decisions based on a more familiar "Low to Extreme" type modeling system. Some in the fire industry are also using "Andersons Aids for Determining Fuel Models for Estimating Fire Behavior." All three are shown in the chart below.

The classifications used here are as follows:

Old CSFS	NFDRS	Anderson	Description
O			Low Hazard or non-flammable areas. This includes bodies of water, road surfaces, well mowed greenbelts and golf course areas.
X	B, F	6	Heavy gambel Oak. (a.k.a. scrub oak, oak brush), mountain mahogany and other shrub species mixes. This fuel type is dominant in the entire community. (NFDRS Fuel Model B if untreated. Fuel Model F if mature.)
A	B, L, T	1	Light fuels like natural prairie grasses with a mix of rabbit brush. This type predominates in the east Compartment E. (NFDRS Fuel Model L. Areas with more than 1/3 <sup>rd</sup> rabbit brushed cover should be Fuel Model T.)
B	E, R	5	Medium fuels like those found along the edge of meadows with invading pines and other shrub mixes. (NFDRS Fuel Model E after leaf drop and Fuel Model R after trees have leafed out.)
C	G, H, U	2, 8, 10	Heavy conifer tree areas found in pockets in the West and South Compartment. These tend to be predominantly

			Douglas-fir growing on north facing slopes. (NFDRS Fuel Model G if untreated with down fuels and dwarf mistletoe. Treated stands, thinned and ladder fuels removed, could be considered as Fuel Model H.)
--	--	--	---

Fuel mapping for Woodmoor Mountain was not necessary given that with the exception of one compartment, all compartments are Fuel Type C (NFDRS= G, H, U; Anderson 2, 8,10).

### 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:

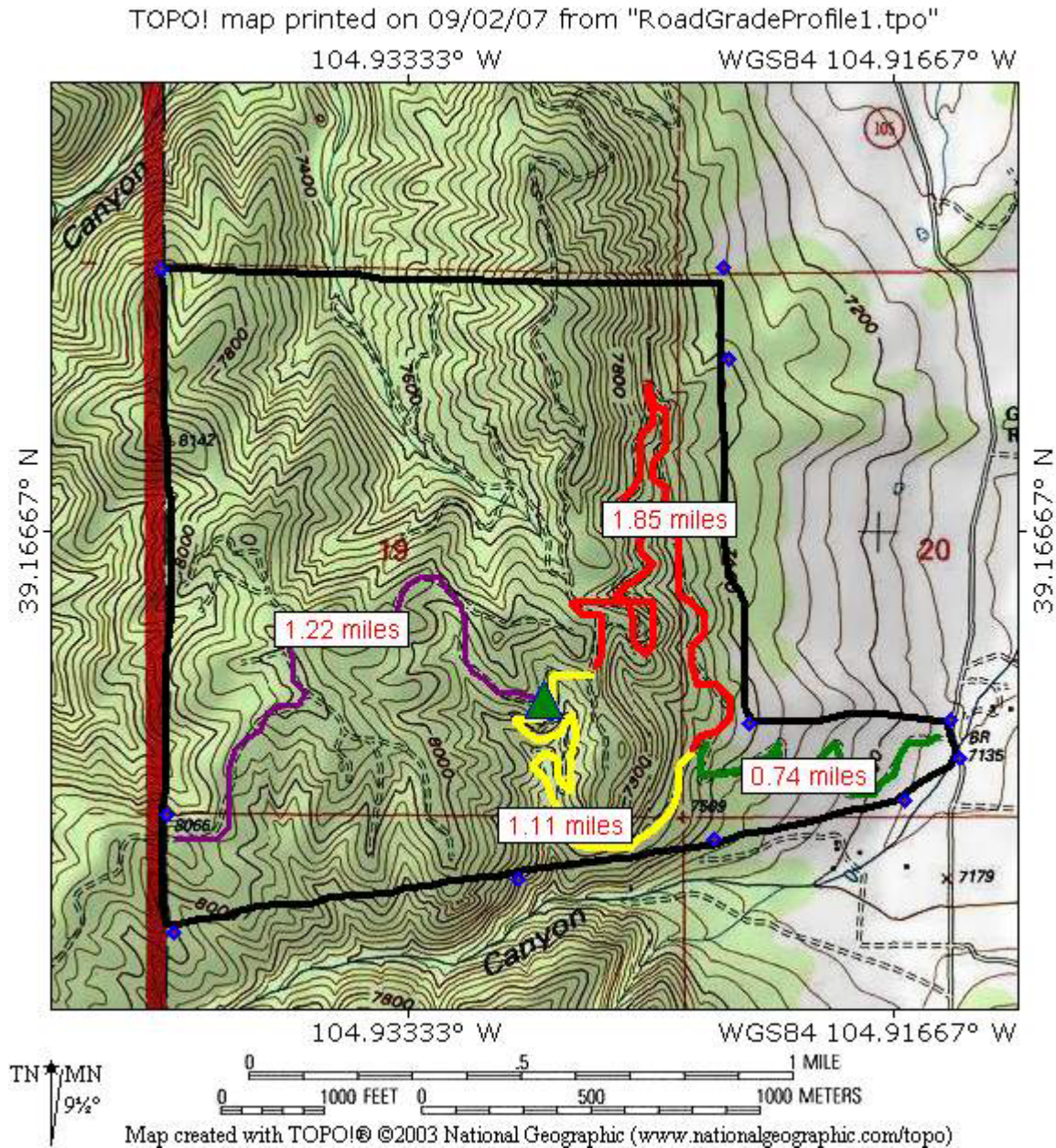
- 1) Hazard risk priority for the mitigation project;
- 2) Cost of the project and manner of funding to be used;
- 3) Environmental conditions required for mitigation; e.g., moisture levels, air quality management, etc.
- 4) Timing of “*tie-in*” projects impacting terrain identified for fuel reduction; e.g., development activity and USFS or adjacent private property projects.

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



## Emergency Egress

Woodmoor Mountain was originally designed in the 1970's to have multiple egress points. The bankruptcy of the original developer and disposal of properties to other entities eliminated options that would have occurred during the phased development of the community. The Primary looped extension of Mountain Ranch Drive connects to Cook Creek Drive (see **Figure 8**).



**Figure 8. Emergency Egress Routes**

Multiple ingress and egress points are critical to public safety. Egress is needed for residents to evacuate and ingress required for emergency services. This is stressed in the Douglas County Land Development Codes (DCLDC) and Douglas County Comprehensive Master Plan 2020

(DCCMP). Specific references to “emergency service access” can be found in **Policy 4-10B.5** and **Policy 4-10B-17** of the DCCMP.

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 Woodmoor Mountain (*Public Safety in the Urban-Wildland Interface: Should Fire-prone Communities Have a Maximum Occupancy?* Thomas J. Cova, Natural Hazards Review, August, 2005). At present, only one actual egress point exist from Woodmoor Mountain. 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 evacuations. This is also confirmed by studies of evacuation fatalities in Australia. 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.

Creating secondary access out of Woodmoor Mountain may not be possible or practical. Therefore, it is critical that all roadways be heavily treated to reduce fuel volumes along major ingress/egress routes. It may be possible, in the interim, to create small staging areas (see Figure 9, Potential Staging Areas) that can allow for residents to remain temporarily when emergency services may be trying to enter the community. Efforts should be made to work with the Emily Griffith Center to see if an access is possible into the Center property. All other existing “two-track” roads to the south and west are too steep and fuel lined to be considered.



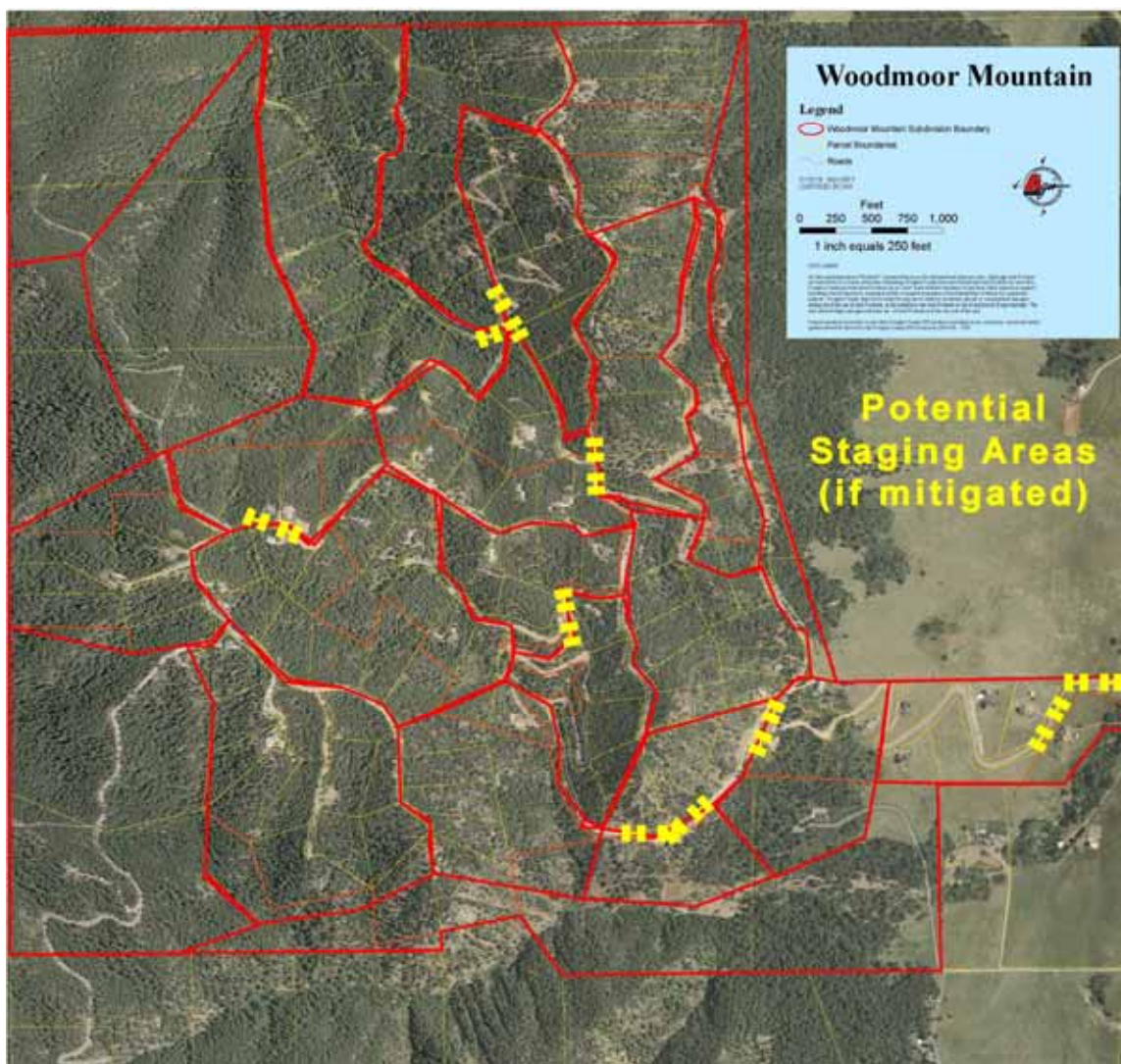


Figure 9, Potential Staging Areas

### 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. 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 homeowners 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 mental scars that may be caused by exposure to an extreme fire event.



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. Pre-designated “safe” homes can allow for fire frontal passage and deployment back into neighborhoods to check on structures and perform “mop-up” operations. Ideally, all homes are safety zones and fire fighters can focus on protecting natural resources.

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

## SERVICES, INFRASTRUCTURES, WILDLAND FIRE RESPONSES

This section of the WMCWPP details professional and voluntary resources available to respond to emergencies associated with wildland fires impacting Woodmoor Mountain 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 LFPD and DCOEM. These voluntary groups are only used when professional first responders cannot respond and then can only be activated by authorization of the Emergency Services Manager or the Chief of the local Fire Protection District.

### Professional Wildland Fire Response Services

For wildland fire emergencies endangering Woodmoor Mountain, the first line of professional responders is LFPD. If LFPD 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. Larkspur Fire Department will coordinate and administrate these services.

### Douglas County Emergency Services

*Douglas County Sheriff's Office*, under the *Douglas County Emergency Services* division, 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 Incident Management Guidelines and Standards*. The *Incident Management Guidelines and Standards* can be found in total at:

[http://www.douglas.co.us/emergencymanagement/incident\\_management\\_team.html](http://www.douglas.co.us/emergencymanagement/incident_management_team.html)

In the emergency event of a wildland fire, 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 Larkspur Fire Protection District, Castle Rock Fire Rescue Department, South Metro Fire Rescue, County of Douglas, Franktown Fire, Jackson 105 Fire, City of Littleton, Mountain Communities Fire, Parker Fire, West Metro Fire Rescue, Tri-Lakes Fire Rescue, Palmer Lake Fire Department, and West Douglas Fire. It should be noted that an "Auto-Aide" agreement is in place with the El Paso County Northern Group of fire departments (Woodmoor, Tri-Lakes, Palmer Lake, Black Forest and Air Force Academy).

As resources begin to deplete and the situation is recognized to be one that could be disastrous, municipal and county officials will become involved. At that time, the Multi-Agency Coordination Group (MAC Group, reference: Douglas County *Incident Management Guidelines and Standards*) shall confer and determine what special provisions need to be made or what special action needs to be taken. At this point, the need for the Emergency Operations Center (EOC) will be considered. EOCs locations for Douglas County are pre-established by the *Incident Management Guidelines and Standards*. 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<br>Robert A. Christensen Justice Center<br>4000 Justice Way<br>Castle Rock | 4. Parker Police Department<br>19600 East Parkersquare Drive<br>Parker             |
| 2. Park Meadows Center<br>9350 Heritage Hills Circle<br>Littleton   | 5. Roxborough Park Metro District<br>6222 North Roxborough Park Road<br>Roxborough |
| 3. Highland's Ranch Community Assoc.<br>48 West Springer Drive<br>Highlands Ranch                             | 6. Larkspur Fire Station 161<br>9375 South Spruce Mountain Road<br>Larkspur        |

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 Emergency Services.

The following is a list of commonly requested resources that are available through Douglas County Public Works:

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 *Incident Management Guidelines and Standards*: 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 Civilian Fire Fighting Forces may be augmented by Federal Agencies.

### Larkspur Fire Protection District

Larkspur Fire Protection District (LFPD) is the first responder to a sighted or reported wildland fire threatening the environs surrounding and interior to Woodmoor Mountain. LFPD has three stations: Station 161 located in the Town of Larkspur; Station 162 located in Perry Park; and Station 164 located at Bald Mountain. The overall equipment resources of LFPD are:

#### Equipment-

- Type 1 Engine- 4
- Type 3 Engine- 1
- Type 6 Engine- 4

Type 2 Water Tenders- 3  
 Support Truck- 1  
 Quick Response Vehicle- 1  
 ALS Medic Vehicle- 3  
 Command Response Vehicle- 2

In the event LFPD personnel and equipment resources become exhausted, first reinforcement mutual aid calls are Jackson 105 (Station 143), Castle Rock Fire Department (Station 151) and El Paso County Wildfire Team.

LFPD's established first thrust strategy for fighting wildland fires endangering the Woodmoor Mountain area is *direct suppression*. If suppression is not an option, then a defensive posture will be taken. Engines will be stationed at the most vulnerable structures first. Structure prep should include closing up structures, placing hose lines into use and removal of fuels around homes. Black lining (burning out) should be accomplished quickly and safely.

### **Emergency Medical Services**

LFPD provides first response emergency medical services to Woodmoor Mountain. The list below is the breakdown of the LFPD emergency personnel resources and staff.

LFPD Full Time Staff Personnel (16) as of January 2007:

Administrative Staff (all are also Firefighters) & (1 Paramedic EMT & 3 Basic EMTs)

- 1 – Chief
- 1 – EMS Division Chief
- 1 – Training Officer (Lieutenant)
- 1 – Fire Marshal

Shift personnel (4 on duty 24 hours/day, 7 days/week; the shift complement is staffed with 2 Paramedic EMTs and 2 Basic EMTs)

- 12 – Firefighters (3 shifts of 4 each; The 12 firefighters comprise 6 Paramedic EMTs and 6 Basic EMTs. One Lieutenant is assigned per shift.)

In addition to the full time staff, LFPD has 3 part time Firefighters/Basic EMTs (Note: These part time Firefighters will be replaced with 4 additional full time Firefighters during the first quarter of 2007.) LFPD has 32 Volunteer Firefighters.

### **Water Resources**

Woodmoor Mountain currently has no emergency water supply. The closest supply of water is in the Town of Palmer Lake, five miles away. The WMHOA has been investigating costs for installation of an emergency water supply. The following are recommendations from the CWPP partners:

#### **Option 1**

Install a 10,000 gallon tank at the intersection of Cook Creek Drive and Rocky Point Lane. Install a 33,000 gallon tank in the entrance area to the community. Either may use common area or easements granted by private owners.

#### **Option 2**

Install one 33,000 gallon tank at the intersection of Cook Creek Drive and Rocky Point Lane. This may require easements from WMHOA or private owners.

Option 1 may be the best option given limited space within the WMHOA community. LFPD is investigating installing a rural water supply along the DC-105 southern corridor to provide water to communities in the general vicinity. If this was installed at the WMHOA entrance area, costs could be shared with LFPD. It is assumed the 10,000 gallon tank would be a WMHOA expense. This would provide sufficient water supply for wildland firefighting on Woodmoor Mountain. The intersection proposed for the interior tank could be kept topped off from a neighboring property's residential well after initial filling by LFPD. The Cook Creek/Rocky Point intersection provides adequate room for filling and refilling operations, while allowing other resources to pass. If placed properly, it could potentially provide gravity flow for refilling.

Option 2 would require more area for installation and maintenance. Costs would be borne by WMHOA.

Residents and the WMHOA do not currently have cash reserves necessary to fund either option without a special assessment to all property owners which must be approved by a 2/3<sup>rd</sup> majority of all property owners. However, given the present insurance market and focus on WUI homes, this may become a sound economic decision to invest in a water supply sufficient to provide adequate water for structural protection as well as wildland fire defense. Other funding sources should also be investigated. Several private foundations occasionally fund items necessary for firefighter safety.

### **Refuge Zones/Staging Areas**

During emergency situations, it may be necessary for residents and emergency services providers to reach a safe place that is inside of the community. LFPD, in conjunction with other wildfire authorities, recommends establishment of Refuge Zones 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 as staging areas 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 WMHOA web sites will be essential. Mail kiosks can also be used as posting places.

### **Internal Volunteer Services and Communications**

WMHOA does not currently support any volunteer and paid groups that can be used in communication support or augmentation of professional first-responders within WMHOA neighborhoods in the event of a wildfire emergency. It is strongly recommended that the Board implement operating agreements with LFPD that allow for use of WMHOA properties and facilities during emergency situations. A sample agreement is included in **Appendix F**.

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 WMHOA

and the LFPD web sites. The Douglas County Sheriff's Office (DCSO) may also have an emergency phone line set up to provide information.

The WMHOA board and its managers should develop an emergency response plan for interaction with emergency services providers. This needs to be developed prior to emergencies and allow access WMHOA Board or designated representatives to the Incident Command Center or Outpost. 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 Woodmoor Mountain, LFPD or DCESM Incident Command dispatcher 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: *Aquila*  
Emergency Service Telephone Number: (800) 303-0357

Electrical Power Services: *Intermountain Rural Electric Association*  
Emergency Service Telephone Number: (303) 688-3100

### **Direct Support**

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

Water: *N/A*

Wire-line Communications: *Qwest Communications:*  
Emergency Service Telephone Number: (800) 573-1311 or  
1-800-603-6000

*Comcast*  
Emergency Service Telephone Number: (303) 930-2000

Any communication for support by utilities in an area impacted by an emergency 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, WMHOA 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 WMHOA 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 WMHOA should be prepared to:

1. Immediately retain the services of an engineer or geologist 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 WMHOA should annually assess its risks and budget accordingly for remediation.

### **Insect and Disease Prevention and Control**

The area contains stands of ponderosa pines that will be susceptible to Mountain Pine Beetle (MPB) infestation. No infested trees were noted during the CWPP adoption process. However, vigilance will be necessary on the part of WMHOA to regularly inspect trees on private lots and greenbelt areas for any signs of infestation. Large groups of dead trees can contribute to fuel loading in the community and should be removed in a timely manner to prevent spread. Severe infections of Dwarf Mistletoe (DMT) have been found in throughout the community. No general, area wide preventive spraying program is recommended at this time for prevention of MPB. Should an outbreak occur in the area, homeowners should be advised to preventively spray mature pines.

Spruce Budworm and Douglas-fir Tussock moth are now building to damaging levels in Douglas County. Spruce budworm damage was noted as heavy in some areas of Woodmoor Mountain. If not controlled, trees will be weakened and susceptible to attack by bark beetles. This will also contribute to fuel loading.

Builders who remove trees for lot clearing and subsequent home construction should remove all lot clearing slash within six weeks of removal to prevent use of fresh slash by Ips Engraver Beetles (Ips) as brood wood. Ips generally attack trees weakened by lightning strikes, root damage during construction or transplanting. Regular bark applications of high value, stressed trees should be preventively sprayed until the stressing agent is eliminated.

Gambel oak is prone to periodic outbreaks of defoliating insects. These outbreaks tend to be cyclical and do not generally cause oak loss. Often, by the time damage is noted, the insects have completed their life cycles and spraying is ineffective.

### **Weed Control**

Virtually all areas of Woodmoor Mountain are infested with noxious weeds that are displacing native plants and degrading wildlife habitat. WMHOA has been spraying Common Areas on the "loop" (Mountain Ranch/Cook Creek) which have been sprayed for the past two years. Noxious

weeds can also contribute to wildfire spread. WMHOA should continue its annual control program of mowing and spraying. If spraying is not possible, biological control agents (typically host specific insects), should be introduced to lower the rate of spread.

Poison ivy can be found throughout drainage ways in open space areas. This plant will pose a hazard to firefighters during hand line construction. Smoke from burning poison ivy can also be toxic if inhaled or exposed to eyes. Control will be difficult when found growing intermixed with other native plants. A program to reduce and contain poison ivy is strongly recommended.



## 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 Woodmoor Mountain community can be authorized only by LFPD, DCOEM Douglas County Emergency Services Coordinator or the Douglas County Sheriff. 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\*

### Services Communications and Support Systems

#### *Non-threatening Conditions*

Informational notifications of WMHOA 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.woodmoormountain.com](http://www.woodmoormountain.com).

#### *Wildfire Condition*

In the event of an actual wildfire impacting the community, updated residential wildfire event information should be posted periodically on the HOA website. 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 event established, 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.

## IMPLEMENTATION PLAN

Chapter 8 provides a summary of actions of Woodmoor Mountain Community Wildfire Protection Plan. These actions are designed to address four broad subject areas to enhance residents' safety and diminish wildfire potential in Woodmoor Mountain and its adjacent environs 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 Woodmoor Mountain and adjacent private and United States Forest Service owned lands. The general periods identified for developing fuel breaks 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 planning for wildfires as well as fighting them in the event one or more should occur in the community. 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 WMHOA administrative actions associated with the Community Wildfire Protection Plan.

### Public Education

The Woodmoor Mountain community has moderate residential turn-over and influx. Based upon average monthly real estate listings weighted against average home sale time period or "*life on market*," Woodmoor Mountain may experience up to 10% change to its profile of residents during the year. Many of these "*new*" residents of the community 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 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 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
  - Chainsaw safety and use
- Public Education programs will use professionally developed instruction collateral 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
  - Larkspur Fire Protection District

- Douglas County
  - Private Consultants
- Upon publication of the 2007 Community Wildfire Protection Plan for Woodmoor Mountain, the Wildfire Committee will develop an annual schedule that is published and periodically recapped in the community newsletters. Also, see Appendix E, *Firewise Household Tips, Property Mitigation and Protection*.

Although several public meetings have been held to inform and/or assess the opinions of the general public on *Firewise* and wildfire issues, the 2007 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 against the wildfire protection plan program, training session attendance should be totaled annually and expressed as a percentage of total residents. This percentage should be trended year after year for evaluation and public education course management purposes.

## Fuels Treatment

Earlier in Hazard Assessment, Chapter 4, potential wildfire fuel treatment areas were identified in three groupings: 1) *Road Rights of Way and Safety Zones*; 2) *WMHOA Land*; 3) *Private Homeowner and Landowner Properties* and 3) *Undeveloped, Privately-owned Properties*. The implementation actions set forth in this Plan address each of these individual areas separately.

### *Road Rights of Way and Safety Zones*

Fuel Treatments along roadways provide quick, safe access for wildfire defensive positions and wildfire suppression; as such, they are necessarily linked with roads systems. Where possible, potential fuelbreaks proposed in this Plan have been connected with WMHOA-specified roads and time-established trails within Woodmoor Mountain's less developed areas. These potential fuel treatments will provide good access and defensive positions for firefighting equipment and support vehicles. In addition to creating defensive gaps of potential wildfire fuel and affording good access, potential fuel treatments are proposed in this plan to create "*compartments*" within Woodmoor Mountain that break up large tracts of dense fuel, thus limiting uncontrolled spread of wildfire. The planned fuel treatments and the "*compartments*" they enclose can be seen on the Compartment Map, Chapter 4, *Hazard Assessment*.

Adequately designed Refuge/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 and pruning of ladder fuels. Caution should be taken on large scale forest openings and their impact of soil erosion; especially on steep slopes.

### Implementation Actions

- Mitigate existing and proposed road areas within the right of way associated with the road. Generally, in all established and planned roads within Woodmoor Mountain, this action creates a fuel gap of 60-120 feet; i.e., 20 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 terrain slope, this Community Wildfire Protection Plan initially establishes a break of 60 feet since such can be addressed quickly within the road right of way, followed later by working with adjacent landowners to encourage widening the fuel treatments into fuelbreaks by encouraging "*feathering*" of the fuel treatments into their private land. The WMHOA Board will:
- Work with Larkspur Fire Protection District, CSFS and Douglas County Emergency Services 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 (2008 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 WMHOA Board 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 WMHOA website for public access.
- Schedule for maintenance any re-treatments of previously treated areas.

#### *WMHOA Properties*

The WMHOA 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, WMHOA properties should be treated to a higher level than that on private property; especially where no defensible space can be created by individuals. Examples of this are where homeowners may be dealing with absentee landowners, ownership (federal) issues, endangered species, or sufficient room to property lines. On-going maintenance by outside contractors or in-house staff will be important to provide risk reduction for adjacent home sites.

#### Implementation Actions

The Wildfire Committee and Architectural 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 and conifer plant community. Visual sensitivity will be important. The WMHOA Board will:

- Work with wildfire professionals to lay out treatment areas on WMHOA properties by advising the ACC of all activities. Coordination with adjacent property owners will be necessary.
- The same items noted under Fuel treatments and Safety Zones will apply.
- Recognize and adopt SB-100 wildfire mitigation language as part of the ACC process (see Appendix B, SB-100) so that no homeowner is prohibited from implementing mitigation efforts if a plan has been prepared by CSFS, approved plan preparer or LFPD.

#### *Private Homeowner and Landowner Properties*

Wildfire fuel mitigation on private properties is the responsibility of the property owner. Having no authority over private lands, WMHOA will provide information and services to assist property owners in their mitigation efforts. Land owners adjacent to WMHOA properties will be encouraged to work with WMHOA in extending mitigated fuel treatments into their private property. Such potential action is deemed to benefit both WMHOA and the individual landowner(s).

#### Implementation Actions

- WMHOA and/or Larkspur Fire Protection District will work with private property owners within the boundaries of Woodmoor Mountain to support them in mitigation efforts by:
  - Providing resource and education help as indicated in the “*Public Education*” actions, above;
  - Continue to track “*in kind*” private fuel mitigation work on private property;
  - Fund certain support projects; e.g., periodic *slash* removal;
  - Continue to fund the slash and yard waste disposal sites;

- Formalize Design Review processes and Design Guideline modifications that allow for implementation of Defensible Spaces. These shall utilize the services of LFPD fire fighters and professional foresters. Note: The recent passage of Colorado State Statutes that must allow for homeowner defensible spaces shall be incorporated into any new guidelines.
- Continue to encourage replacement of wood shake-shingle roofs by allowing as many materials as possible. Note: There is no prohibition on use of fiberglass composition roofing. 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

Areas of undeveloped land lie to the north, south, and east of the Community (See Chapter 4, *Hazard Assessment* and Appendix A, *Hazard Reduction Mitigation Projects*). These areas are heavily covered with dense, untreated timber and, in many situations, also present rough, dramatically sloping terrain. Consequently, these areas present huge fuel beds for wildfires and present Woodmoor Mountain with its most significant threats for wildfires. The undeveloped, and generally privately-owned, areas may require Woodmoor Mountain residents to take more aggressive action on their properties in order to address fuel reduction.

#### Implementation Actions

- WMHOA and/or Larkspur Fire Protection District will work with private property owners of undeveloped and lands bordering on Woodmoor Mountain to discuss, assess, and plan potentially joint mitigation efforts. Concurrently, WMHOA will pursue collaboration with Douglas County agencies and Douglas County officials to assist and support efforts to reduce 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 them, in conjunction with Douglas County, to effect guideline driven fuel mitigation on their targeted properties prior to structure construction;
  - Encourage and stimulate Douglas County authorities to effect changes in ordinances and statutes to require developers to mitigate the areas being developed prior to any construction;
  - Initiate further discussion with owners of large parcels (to the north, south and east), and the United States Forest Service (with the Pike National forest to the west) to assess potential individual and joint wildfire mitigation efforts on common interest areas.

### **Communication, Support and Information Services**

Communication, support and information services, both with professional firefighting- emergency services agencies and with the general public, is instrumental in nurturing wildfire preventive action as well as protection in the event of a wildfire emergency (See Chapter 7, *Public Notification, Communication and Support*). Actions designated below are targeted at raising public awareness, providing preventive and protection/fire suppression support and recognizing efforts that have and will be taken relative to wildfire fuel mitigation in and around Woodmoor Mountain.

#### Implementation Actions

- Implementation actions are recommended to:
  - Notify public of wildfire preventive actions being taken by using the WMHOA newsletter and WMHOA Website, distributed flyers, direct mailing, or combinations of the aforementioned media.
  - Recognize implemented projects in the newsletter and on the website;

- Identify, schedule and fund wildfire protection ancillary projects; e.g., Remote Automated Weather System (RAWS), improved communications, signage, etc.

### **Mitigated Areas Perpetuation**

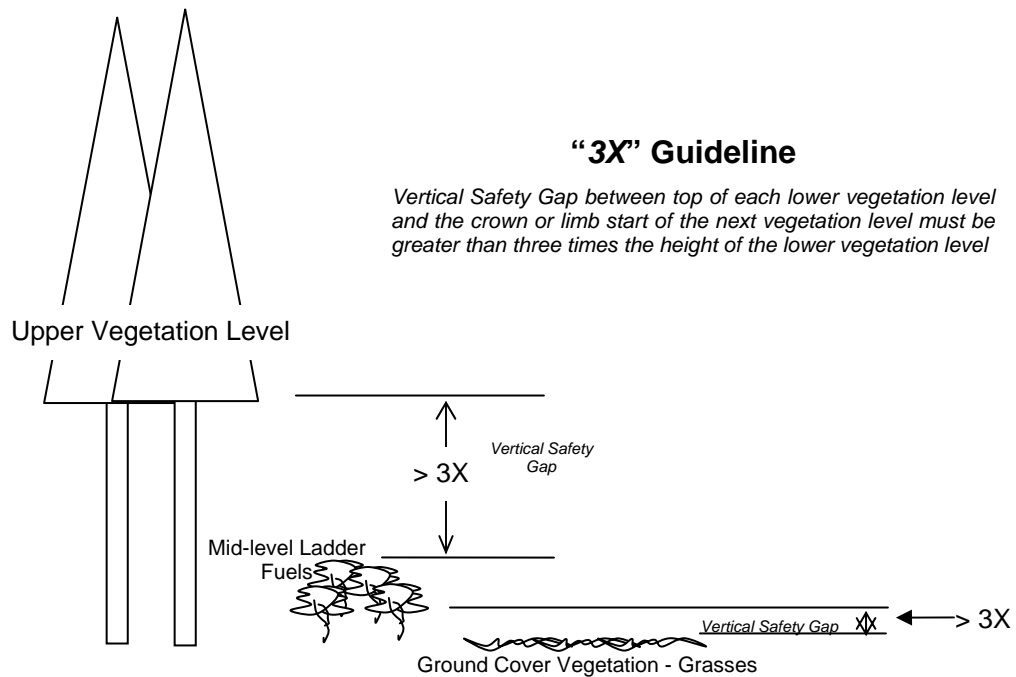
The focus of this broad section of the Implementation Plan is twofold: 1) to address the guidelines for assessing when to maintain fuel areas that have already had fuel reduction efforts applied and 2) to set forth a checklist of administrative actions that need to be followed by WMHOA.

#### Implementation Actions

- Existing wildfire fuel treatments and private land areas that have been mitigated need to be maintained to be effective. In order to evaluate effectively when maintenance of mitigated areas is needed, a forestry “3X” guideline, described below, exists. This guideline is applicable to both private property and WMHOA property. To maintain mitigated areas, private property owners and the WMHOA board should:
  - Assess mitigated property periodically and determine the relationship of the property’s vegetation growth against the maintenance guideline for the mitigated property;
  - Apply trimming and cutting maintenance on the previously mitigated property if current vegetation growth falls below the “3X” guideline.

#### *Previously Mitigated Property/Fuelbreak Maintenance “3X” Guideline*

Three layers or vertical levels of growth generally constitute vegetation in a mitigated area: 1) Grasses which constitute the bottom or lower level of growth; 2) Brush or small tree stock that comprise the mid-level, commonly referenced as the primary “*ladder fuel*” level and, 3) Tree crowns, the upper or most vertical level of the mitigated area. The height of each respective level of vegetation is that level’s “X.” The gap between a lower vegetation level’s top and the start of the crown (or bottom limb) level of the next level of vegetation is the safety gap. Whenever the gap level closes to less than three times the height of the next lower level of vegetation (i.e., less than “3X”), maintenance trimming needs to be effected to bring the mitigated area back within the safety guidelines (i.e., more than “3X”).



- The WMHOA Board will implement the following administrative actions:
  - Establish a separate WMHOA 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 WMHOA property, privately owned property WMHOA support functions and WMHOA work with undeveloped parcels of privately owned land);
  - Detail a chronological schedule for filing for Federal grants applicable to mitigation and Firewise work as these may become available;
  - Budget specific WMHOA funds for “direct” funded wildfire fuel mitigation on road/trail rights of way and WMHOA owned property;
  - Contact and begin discussion with private property owners adjacent to Woodmoor Mountain for potential individual and joint wildfire mitigation efforts on common interest areas;
  - Fund wildfire prevention training for Woodmoor Mountain residents;
  - Assess timing of and maintain a schedule of land development action in currently undeveloped areas;
  - Support the Fire Mitigation Committee recommendation to effect a second road for egress/ingress to Woodmoor Mountain in accordance with Douglas County *Comprehensive Master Plan* 10B-18;
  - Schedule appropriate, periodic general public updates of CWPP planned work;
  - Continue to identify and schedule wildfire protection ancillary projects; e.g., Remote Automated Weather System (RAWS), improved emergency communications, emergency and wildfire protection signage, etc.
  - 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.

### Insect and Disease Control

Many areas in the community are impacted by pine dwarf mistletoe and Douglas-fir dwarf mistletoe (DMT). In many areas, infection levels are 100% and control will be impossible. It should be noted

that “brooms” formed by dense DMT growths can contribute to wildfire spread and intensity. Heavy brooms found on trees along right-of-ways should be either pruned or entire trees removed. In many cases, trees are at an infection rating of 6 (scale of 1-6 with 6 as most severe). In areas with highly erodible soils, pruning may be necessary to maintain some form of forest cover. The following actions should be incorporated into future planning:

1. Identify all areas and types of infections.
2. Develop a strategy of DMT containment through buffer strips between infected and uninfected stands. Utilize any DMT buffers as fuel breaks.
3. Prune “brooms” along all roadways and/or remove rapidly declining trees close to roads.
4. Thin infected stands to improve individual tree health.

Mountain pine beetles (MPB) will begin to impact ponderosa stands within the next 5-10 years. Direct control of infested trees should be a requirement of all homeowners to reduce rate of spread. However, untreated USFS and adjacent private lands may still allow MPB to reach epidemic levels in the community. The following actions will be necessary:

1. Train all homeowners in MPB detection and control.
2. Establish an annual inspection program of all pine stands and locate infested trees by early summer.
3. Develop a plan for infested tree removal and treatment.
4. Recommend preventive spraying of high value pines on residential properties. All infested trees should be treated or removed by July 15<sup>th</sup> of each year.
5. Thin all pine stands to CSFS recommended levels for improved tree health and vigor.

Several other forest insects are present. Spruce budworm defoliation on Douglas-firs was found to be heavy in some areas of Woodmoor Mountain. If this outbreak continues, high value trees should be treated to prevent losses that will contribute to additional fuel loading. Budworm defoliated trees will become more susceptible to attack by bark beetles. Budworm outbreaks are often controlled by climatic factors that allow for either epidemic or endemic conditions. The following actions may be necessary:

1. Monitor current infestations to determine need for direct control/spraying.
2. If infestation levels remain high, foliar applications of pesticides or biological control agents (Bt) may be required.
3. Thin all Douglas-fir stands to improve tree health and vigor. Increased distances between trees also allows for heavier predation by budworm predators.
4. Remove all dead trees as soon as possible to reduce fuel loading.
5. Contact CSFS foresters annually to stay abreast of infestation levels.

The insect pest currently being monitored throughout western Douglas County is Douglas-fir tussock moth. This pest can rapidly defoliate and kill Douglas-firs. Typically, infestations are at low levels and inconspicuous. However, climatic factors can allow for occasional outbreaks. The best known outbreak occurred along Sugar Creek Road, southwest of Sprucewood along HWY 67 in the mid-1980's. Several hundred acres were killed resulting in almost total tree loss. No action is required at this time. WMHOA should stay in contact with CSFS foresters to monitor for outbreaks in the area.



**Appendix A**

**Compartments,  
Acres, and Estimated Costs**

# **Compartment A Fuel Treatments**

2

Appendix A  
**9/20/2007**

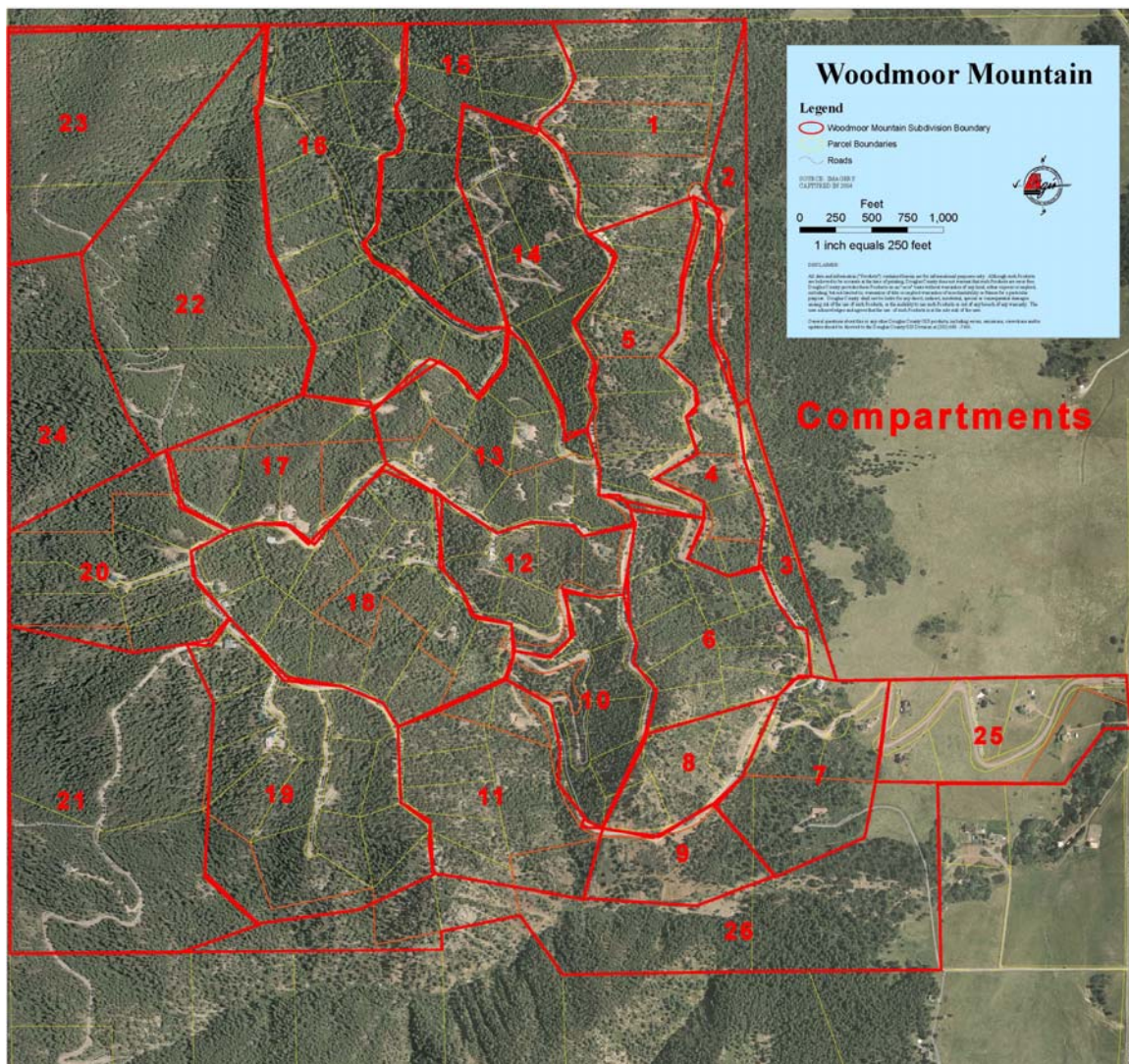
						PP= Ponderosa Pine; DF= Douglas-fir; DMT= Dwarf Mistletoe
Unit #	Priority	Fuel Type	Acres	Trtmnt cost/ac.	Est. Cost	Description
1	3	C	34.1	\$1800	\$61,380	East to NE facing slope, 30-70% grade. Heavy Douglas-fir/pine mix below homes.
2	2	C	11.2	\$2500	\$28,000	East to NE facing slope, 30-70% grade. Heavy Douglas-fir/pine mix below roadway (Mtn. Ranch Dr.).
3	2	C	7.5	\$2500	\$18,750	East to NE facing slope, 30-70% grade. Heavy Douglas-fir/pine mix below roadway (Mtn. Ranch Dr.).
4	2	C	12.2	\$1800	\$21,960	East to NE facing slope, 30-70% grade. Heavy Douglas-fir/pine mix below and above roadway (Mtn. Ranch Dr.). Area is between switchbacks.
5	2	C	29.1	\$1800	\$52,380	East to NE facing 30-70% slopes below homes and above Mtn. Ranch Dr.
6	2	C	28.5	\$2500	\$71,250	East to NE facing 30-70% slopes below homes and above Mtn. Ranch and Cook Creek intersection. Anchor to rock outcroppings. Heavy accumulations of down fuels. DMT heavy.
7	1	CX	25.2	\$2500	\$63,000	East to SE facing slopes with 15-70% grades. Below only road access (Mtn. Ranch Dr.) and Mtn. Ranch/Cook Creek intersection. Portions treated at lower switchback, but needs cleanup.
8	1	CX	13.9	\$1800	\$25,020	SE slope, rocky, steep. Heavy down fuels above roadway. DMT heavy with shrub understory.
9	1	C	13.4	\$1800	\$24,120	South slope with scattered tree cover. Below potential refuge zone. Soils highly erodable.
10	1	C	20.6	\$2500	\$51,500	SW slopes around Cook Creek switchbacks. Heavy DF/PP mix. Highly erodable soils around fuel chimneys.
11	1	C	33.4	\$2500	\$83,500	South facing canyon (chimney) below Cook Creek Drive. Heavy DF DMT. Drainage channel through middle of compartment.
12	1	C	19.5	\$1800	\$35,100	South slopes around Cook Creek switchbacks. Heavy DF/PP mix. Highly erodable soils.
13	3	C	32.3	\$2500	\$80,750	North slopes with heavy DF. Home sites between Cook Creek and Mtn. Ranch Dr.
14	3	C	29.6	\$2500	\$74,000	West slopes with home sites between Fire Dog and Deer Trail.
15	3	C	36.3	\$2500	\$90,750	West to NW slopes with home sites above and below. In canyon area with heavy DF/PP mix.
16	3	C	56.6	\$2500	\$141,500	Canyon area at end of Mtn. Ranch Drive. Slopes 20-50% slopes.

# **Compartment A** **Fuel Treatments**

3

Appendix A  
**9/20/2007**

17	3	C	24.3	\$2800	\$68,040	North slope with heavy DF (doghair). Homes clustered on ridge top at Cook Creek. Consider treatment of ridge top as refuge zone.
18	3	C	50.9	\$2500	\$127,250	South to SE canyon below homes. Cul-de-sac and driveways potentially useable for access for fuel treatments.
19	3	C	53.4	\$2800	\$149,520	SW and SE slopes from ridge top roads. PP on SW slopes, DF/PP mix on SE slopes. Treat zone along roadway. Utilize rock formations for anchoring treatments.
20	3	C	33.5	\$2800	\$83,750	West to NW slopes with homes on ridge top. Prioritize 300 feet zone below homes.
21	3	C	70.0	\$2800	\$196,000	West and east slopes with driveway along spine of ridge. Heavy DF and PP mix. Spruce Budworm defoliation heavy. Portions treated by current owner. Access to Pike Natl. Forest through this compartment.
22	4	C	60.4	\$2800	\$169,120	North to NW canyon with sub-standard road into compartment. Use road and old logging trails for access.
23	4	C	41.3	\$2800	\$115,640	North to NE slopes with limited access. Heavy doghair DF and PP. No access to 80% of compartment.
24	4	C	27.8	\$2800	\$77,840	Steep slopes with heavy DF/PP mix. No access at this time.
25	1	A	26.0	\$250	\$6,500	Ingress/Egress point for entire subdivision. Meadow areas. Annual mowing along roadway needed. Most of area well maintained or grazed.
26	4	C	61.9	\$1800	\$111,420	Canyon floor of Cook Creek. Portions accessible through private property below WMHOA.
			852.9		\$2,028,040	Average Treatment cost per acre = \$2,3778



**Notes:**

1. Timber stands are all second growth and overstocked.
2. Dwarf mistletoe is present in Ponderosa Pine and Douglas-fir intermixed throughout the community.
3. Stand densities are 120 to 240 sq. ft. of basal area per acre. Normal for forest health prescriptions should be 80 sq. ft. per acre. Historic levels ranged from 20-60 sq. ft. per acre. North slope DF stands may have historically contained higher basal areas.
4. Heavy DF understory present as major component of ladder fuels.
5. Slopes are potentially erodable. Stands should not be opened too radically in order to reduce erosion potential. Chips placed back on site may reduce erosion potential slightly.
6. No markets currently exist for pole size trees and small sawlogs.
7. Cost estimates are based on all materials being chipped. If other options exist (slash pile burning, lop & scatter, etc.), then costs will be reduced significantly.

8. Harvesting will require specialized equipment capable of operating from roadways to cable materials to work platforms. Very little terrain is considered operable for either rubber-tired or track machinery.

## **Appendix B**

### **Senate Bill SB-100 Wildfire Mitigation**

The following is an excerpt from Colorado Revised Statute 38-33.3- 106.5, passed in 2005 by the Colorado State Legislature. It is also referred to as SB-100 governing Homeowner Associations and allowed resident activities. This Section (e) refers specifically to homeowner ability to perform fire mitigation when HOA rules may prohibit it.

SB-100 language

C.R.S 38-33.3-106.5 (a.k.a. SB-100) states: “ *Notwithstanding 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**  
**Fire Hazard Classes**  
**And**  
**Fuel Models**



## Appendix C Fire Hazard Classes and Fuel Models

### Fire Behavior Vegetation Characterizing Fire Hazard Classes\*

HAZARD CLASS	EXPECTED FIRE BEHAVIOR	VEGETATION (FUELS)
0	None	None (Open water, bare rock, cultivated fields etc.)
X Severe Hazard (Brush)	Flames 5-20' high, of brief duration; high spread rates, at least 40 acres/hr; humans can not safely pass through flames but can occupy burned area within about 15 minutes; short range spotting from blowing embers common.	Dense to moderately dense flammable vegetation <= 10' high, including Gambel Oak, Big Sagebrush, conifer reproduction; abundant litter and/or herbaceous fuel, scattered conifer stand may be present.
A Low Hazard	Flames <= 5' high, higher flare-ups rare; duration of highest flames 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.	Grass, weeds, brush <= 1' high, dead wood in contact with ground; open conifer stand may be present; includes aspen, cottonwood, willow, grasslands, brush other than oak, sage or ceanothus.
B Moderate Hazard	Intermittent flare-ups occurring up to many feet above tree tops; short and medium range spotting common; behavior between flare-ups as in Class-A; passing through fire front sometimes possible but chancy; parts of burned area can be occupied within half hour.	Medium density conifer stands; surface fuel mainly herbage and litter; some patches of reproduction and dead wood; becomes Class-C if slash is present.
C Severe Hazard (Trees)	Flareups 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.	Dense conifer stands with any surface fuel; medium density stands with Class-X fuels or much dead wood from blowdown. Insect activity, or logging.

0 Hazard = No Hazard or Limited Hazard

X Hazard = Severe Wildfire Hazard (Brush)

A Hazard = Low Wildfire Hazard for Grass, Timber and Brush

B Hazard = Moderate Wildfire Hazard for Grass, Timber Brush

C Hazard = Severe Wildfire Hazard (Trees)

\* Courtesy of the *Colorado State Forest Service*

### National Fire Danger Rating Fuel Models

Each weather station can have up to four fuel models that represent the vegetation in the area of the station. A total of twenty fuel models are available to choose from. It is unlikely that more than two or three models will be appropriate for any one station.

Fuel Model	Description
A	Represents grasslands vegetated by <u>annual</u> grasses and forbs. Some brush or trees may be present but occupy a small portion of the area. [Cheatgrass]
L	Represents grasslands vegetated by <u>perennial</u> grasses and forbs. Species are coarser and amounts heavier than those in fuel model A. Some shrubs and trees may be present but occupy a small portion of the area. [Fescue, Wheatgrass]
S	Represents alpine tundra or deep layer of lichens and moss. Some grasses and low shrubs may be present. Fires are low intensity, but difficult to extinguish.
C	Represents open pine stands. Perennial grasses, needle litter and branch wood significantly contribute to the fuel loading. [Longleaf, Ponderosa, and Sugar Pine]
T	Represents shrubs that burn easily and are not dense enough to shade out grasses and other herbaceous plants. The shrubs must occupy at least one-third of the site. [Sagebrush]
N	Represents the sawgrass prairies of south Florida.
B	Represents mature, dense brush 6 feet or more in height. Much of the aerial fuel is dead. Foliage burns readily. Fires are typically intense and fast spreading. [Chaparral]
O	Represents dense, brush-like fuels of the Southeast. Most of the aerial fuel is live. Typically over 6 feet tall. Burns actively except during growing season. [Pocosin]
F	Represents mature oakbrush stands.
Q	Represents Alaskan black spruce. Forest floor is a deep layer of moss and lichens. Also contains some needle litter and branch wood, with nonflammable shrubs.
D	Represents the palmetto-gallberry understory, pine overstory association of the southeast coastal plains. Has a high moisture of extinction. [Southern Rough]
H	Represents healthy stands of short-needled conifers with sparse undergrowth and a thin layer of ground fuels. [White Pine, Spruces, Firs, Larchs]
R	Represents hardwood areas after canopies leaf out in the spring. An "off-season" substitute for fuel model E. Best during the summer in all hardwood and mixed conifer-hardwood stands where more than half of the overstory is deciduous.
U	Represents closed stands of western long-needle pines. Ground fuels

	are primarily litter and small branch wood. [Jeffery, Sugar, and Red Pines of the Lake States]
P	Represents closed stands of southern long-needle pines. A thick layer of lightly compacted needle litter is the primary fuel. High moisture of extinction. [Loblolly Pine]
E	Represents hardwood and mixed conifer-hardwood stands <u>after leaf fall</u> . Fuel is primarily loose hardwood leaf litter. [Oak and Hickory]
G	Represents dense conifer stands where there is a heavy accumulation of litter and downed woody material. Typically overmature and suffering insect and disease damage. Undergrowth is variable and restricted to openings. [Spruce-Fir, Lodgepole Pine]
K	Represents light slash from thinnings and partial cuts in conifer stands. Slash is typically scattered under an open canopy. Applies to hardwood slash and southern pine clearcuts where the fuel loading is relatively light.
J	Represents medium slash from clearcuts and heavily thinned conifer stands. Needles are still attached to branches. Material is typically less than 6" diameter.
I	Represents heavy slash loading from conifer clearcuts. Needles are still attached to the branches.

## Common Terms - National Fire Danger Rating System (NFDRS)

**Ignition Component (IC)** - Related to the probability of a firebrand producing a fire that will require suppression action. It is mainly a function of the 1 hour time lag (fine fuels) fuel moisture content and the temperature of the receptive fine fuels. IC has no units. A percentage of probability from 1-100.

**Spread Component (SC)** - A rating of the forward rate of spread of a head fire. It integrates the effect of wind, slope, and fuel bed and fuel particle properties. The daily variations are caused by the changes in the wind and moisture contents of the live fuels and the dead fuel timelag classes of 1, 10, and 100 hr.

**Energy Release Component (ERC)** - Based upon the estimated potential available energy released per unit area in the flaming zone of a fire. It is dependent upon the same fuel characteristics as the spread component (SC). The day to day variations of the ERC are caused by changes in the moisture contents of the various fuel classes, including the 1000 hour time lag class. ERC is derived from predictions of the rate of heat release per unit area during flaming combustion and the duration of the burning. Expressed in BTU's per square foot.

**Burning Index (BI)** - A measure of fire intensity. BI combines the Spread Component and Energy Release Component to relate to the contribution of fire behavior to the effort of containing a fire. BI has no units, but in general it is 10 times the flame length of a fire.

**Fire Load Index (FL)** - A rating of the maximum effort required to contain all probable fires occurring within a rating area during the rating period. It is the cumulative index of the NFDRS. It is designed to combine the projections of fire occurrence and behavior into a single number that

can be related to the total fire suppression job. The meaning of FL has been left to the user. By itself, it does not tell the user much about the nature of the fire management problem. One needs to examine the individual components and indices that are the basis for the FL. It ranges over a scale of 1-100 and has no units.

**Staffing Level (SL)** - A component of the NFDRS relating to the level of fire management staffing. Staffing levels are from 1-5 with 1 being the lowest and 5 the highest.

**Adjective Rating (R)** - A public information component of the NFDRS specific to the rating of fire danger. Adjective ratings are: low(L), moderate(M), high(H), very high(V) and extreme(E).

**Keetch-Byram Drought Index (KBDI)** - A number between 0-800 representing the amount of moisture in the top 8 inches of soil. Zero is saturated, 800 is maximum drought stress. It is calculated from recent precipitation measurements in relation to the average annual precipitation. It is important to note that the KBDI is customized for each geographic area and that often the scale shows less of a range in variation.

**Fire Danger Rating** - A fire management system that integrates the effects of selected fire danger factors into one or more qualitative or numerical indices of current protection needs.

**Haines Index** - A national fire-weather index based on the stability and moisture content of the lower atmosphere and their direct relationship to the growth of large fires. The index is from 1-6 with 1 being the lowest potential for large plume-dominated fires, while 6 is the highest potential for plume-dominated fires.

**Lightning Activity Level (LAL)** - A numerical rating from the lowest of 1 to the highest of 6, keyed to the start of thunderstorms and the frequency and character of cloud-to-ground lightning forecasted or observed on a rating area during a rating period.

**National Fire Danger Rating System (NFDRS)** - A multiple index system developed to provide information about current and predicted fire danger conditions.

**Remote Automated Weather Station (RAWS)** - A special remote fire weather observation station which takes timed measurements of the various weather factors used to calculate fire danger and behavior. These stations usually transmit data via satellite telemetry to the National Interagency Fire Center for distribution to fire managers nation-wide.

**Appendix D**  
**Evaluation and Monitoring**  
**Sample Form**

## Woodmoor Mountain Home Owners Association Community Wildfire Protection Plan Evaluation and Monitoring

**Evaluator:** \_\_\_\_\_

Date: \_\_\_\_\_

Treatment Area: \_\_\_\_\_

Description/Location: \_\_\_\_\_

### Implementation 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:

Fuel Treatment  
Habitat Restoration  
Aesthetics  
Privacy/screening  
Forest Health

Yes	No

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 competitive 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:

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**Appendix E**

**Firewise Household Tips**  
**And**  
**Property Mitigation and Protection**

## Appendix K

### Firewise Household Tips, Property Mitigation and Protection

#### HOUSEHOLD TIPS

1. Keep a clearing of at least 30 feet around your house for fire fighting equipment.
2. Space the trees you plant carefully.
3. Remove "ladder fuels". They link the grasses and the tree tops.
4. Create "fuel break" - - - driveways, gravel walkways, or lawns.
5. Maintain your irrigation system regularly.
6. Prune tree limbs so the lowest is between 6' - 10' from the ground.
7. Remove leaf clutter from your roof and yard.
8. Mow regularly.
9. Remove dead or overhanging branches.
10. Store firewood away from your house.
11. Refuel garden equipment carefully.
12. Maintain garden equipment regularly.
13. If you smoke, use your ashtray.
14. Store and use flammable liquids properly.
15. Dispose of cuttings and debris promptly, according to local regulations.
16. Observe local regulations regarding vegetative clearances and fire safety equipment requirements.
17. Check your generator and/or hose to be sure it is in good repair.
18. Don't keep combustible materials under decks or elevated porches.
19. Make trellises of non-flammable metal.
20. Have at least two ground-level doors as safety exits.
21. Keep at least two means of escape (either a door/window) in each room.
22. Mark your driveway and access roads clearly.
23. Keep ample turnaround space near your house for fire equipment.
24. Prevent sparks from entering your house by covering vents with wire mesh no larger than 1/8".
25. When possible, use construction materials that are fire-resistant or non-combustible.

The following Construction and Landscaping information was reproduced from information produced by Firewise Communities™, [www.firewise.org](http://www.firewise.org), 1 Batterymarch Park, Quincy, MA 02269.

#### Firewise Construction

To create your Firewise structure, remember that the primary goals are fuel and exposure reductions.

- Use construction materials that are fire-resistant or noncombustible whenever possible.
- Consider using materials such as Class-A asphalt shingles, slate or clay tile, metal, or cement and concrete products for roof construction.
- Construct a fire-resistant sub-roof for added protection.
- Use fire resistant materials such as stucco or masonry for exterior walls. These products are much better than vinyl which can soften and melt.
- Consider both size and materials for windows; smaller panes hold up better in their frames than larger ones; double pane glass and tempered glass are more effective than single pane glass; plastic skylights can melt.
- Prevent sparks from entering your home through vents, by covering exterior attic and under floor vents with wire mesh no larger than 1/8 of an inch.
- Keep your gutters, eaves and roof clear of leaves and other debris.



- Clear dead wood and dense vegetation within at least 30 feet from your house, and move firewood away from your house or attachments like fences or decks.

**Any structure attached to the house, such as decks, porches, fences and sheds should be considered part of the house. These structures can act as fuses or fuel bridges, particularly if constructed from flammable materials. Therefore, consider the following:**

- If you wish to attach an all-wood fence to your home, use masonry or metal as a protective barrier between the fence and house.
- Use non-flammable metal when constructing a trellis and over with high-moisture, fire-resistant vegetation.
- Prevent combustible materials and debris from accumulating beneath patio deck or elevated porches; screen underneath or box in areas below the deck or porch with wire mesh no larger than 1/8 of an inch.

**To create a landscape that will make your home less vulnerable to wildfire, the primary goal is fuel reduction. Think of the area around your home in zones. Zone 1 is closest to the structure, Zone 4 is the farthest away.**

- Zone 1 This well-irrigated area encircles the structure for at least 30 feet on all sides, providing space for fire suppression equipment in the event of an emergency. Plants should be limited to carefully spaced fire resistant tree and shrub species.
- Zone 2 Fire resistant plant materials should be used here. Plants should be low-growing, and the irrigation system should extend into this section.
- Zone 3 Place low-growing plants and well spaced trees in this area, remembering to keep the volume of vegetation (fuel) low.
- Zone 4 This furthest zone from the structure is a natural area. Thin selectively here and remove highly flammable vegetation.

Also remember to:

- Carefully space the trees you plant.
- Take out the “ladder fuels” – vegetation that serves as a link between grass and tree tops. These fuels can carry fire from vegetation to a structure or from a structure to vegetation.
- When maintaining a landscape:
  - Keep trees and shrubs pruned. Prune all trees six to 10 feet from the ground.
  - Water and maintain your lawn regularly.
  - Mow dry grass and weeds..
  - Dispose of cuttings and debris promptly.
- Landscape with less-flammable plants: Contact your local state forester, county extension office or landscape specialist for plant information.

**For more information visit these helpful websites:**

- USDA Forest Service, [www.fs.fed.us](http://www.fs.fed.us)
- US Dept of the Interior: [www.doi.gov/bureau.html](http://www.doi.gov/bureau.html)
- National Assoc of State Foresters: [www.stateforesters.org](http://www.stateforesters.org)
- National Fire Protection Assoc: [www.nfpa.org](http://www.nfpa.org)
- US Fire Administration: [www.usfa.fema.gov](http://www.usfa.fema.gov)
- Federal Emergency Management Agency: [www.fema.gov](http://www.fema.gov)
- Firewise Communities: [www.firewise.org](http://www.firewise.org)

- Colorado State Forest Service: [www.colostate.edu/depts/CSFS](http://www.colostate.edu/depts/CSFS)

**Free public information brochures:**

Free brochures on home preparation for wildfire and emergency conditions are also available at the Phillip S Miller Library in Castle Rock.

- *Emergency Preparedness Guide*, published by Douglas County
- *It Could Happen to You!, How to Protect Your Home!*, USDA Forest Service
- *Wildfire Are You Prepared*, American Red Cross, Federal Emergency Management Agency and United States Fire Administration

## **Appendix F**

### **Permission for Homeowners Association Property Use During a Declared Emergency**

**Permission For Woodmoor Mountain Property Use During A Declared Emergency**

During a Douglas County emergency incident impacting Woodmoor Mountain, use of Woodmoor Mountain Home Owners Association (WMHOA) 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 Woodmoor Mountain and requiring WMHOA land use for fighting or resolving the emergency, the WMHOA 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 WMHOA board members is included in this Community Wildfire Protection Plan as Appendix C, page 2. 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 Larkspur Fire Protection District Chief.

**DECLARED-EMERGENCY USAGE PERMISSION**  
**For**  
**Woodmoor Mountain Home Owners Association**

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

WMHOA Property Description or Designation Usage Authorized:

Section 1: (This area will list the legal descriptions of all WMHOA-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 WMHOA owned property during an emergency by firefighting and emergency personnel under the command of the emergency incident commander.

Signed this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ by WMHOA Board of Directors:  
(number) (month) (year)

President

Vice President

Secretary

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Treasurer

Assistant Secretary

**Appendix G**

**Fuel Break Guidelines  
For  
Forested Subdivisions**





# Fuelbreak Guidelines for Forested Subdivisions & Communities

By

Frank C. Dennis



*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.

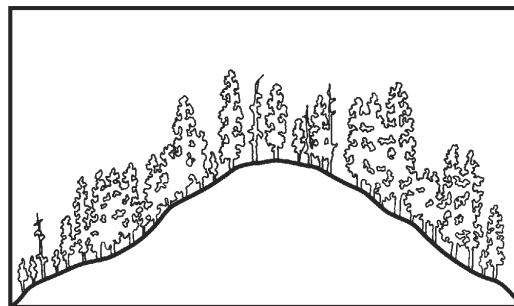
But with development inevitably comes a higher risk of wildfire as well as an ever-increasing potential for loss of life and property. Methods of fire suppression, pre-suppression needs, and homeowner and fire crew safety must all be considered in the planning and review of new developments as well as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

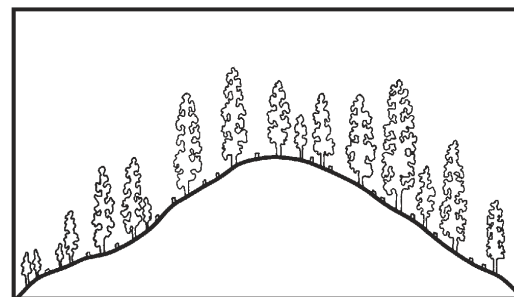
## Fuelbreak vs Firebreak

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

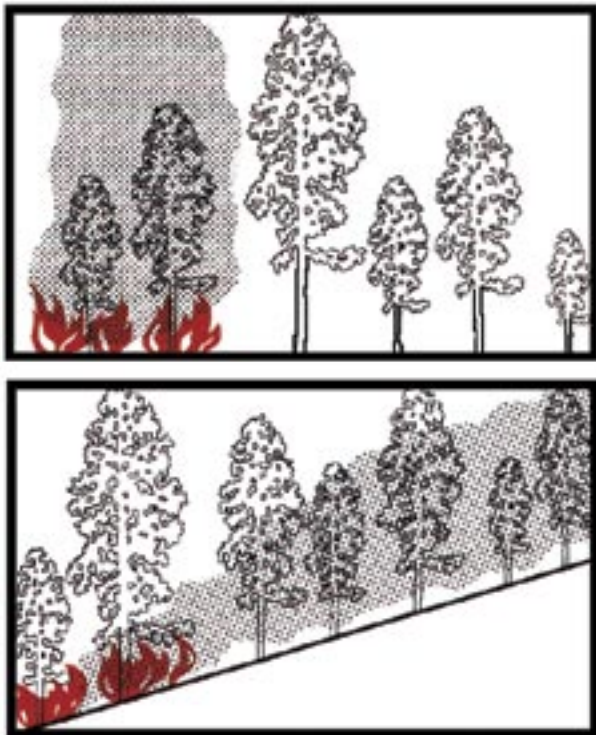


## Wildfire Hazard Maps

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.*



*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 thinning is 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

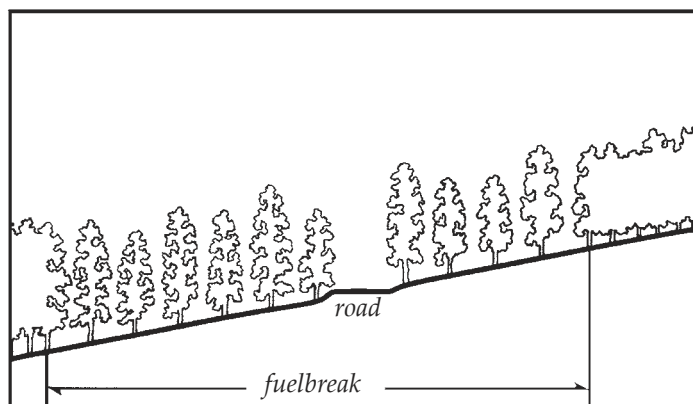
Improperly planned fuelbreaks can adversely impact an area's aesthetic qualities. Careful construction is necessary when combining mid-slope fuelbreaks with roads involving excessive cut-and-fill.



*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

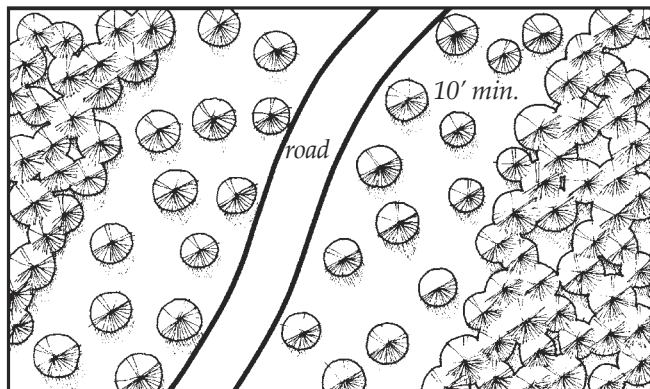
Percent Slope (%)	Minimum Uphill Distance (ft)	Minimum Downhill Distance (ft)	Total Width of Modified fuels (ft)*
0	150	150	300
10	140	165	303
20	130	180	310
30	120	195	315
40	110	210	320
50	100	225	325
60	100	240	340

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



## Stand Densities

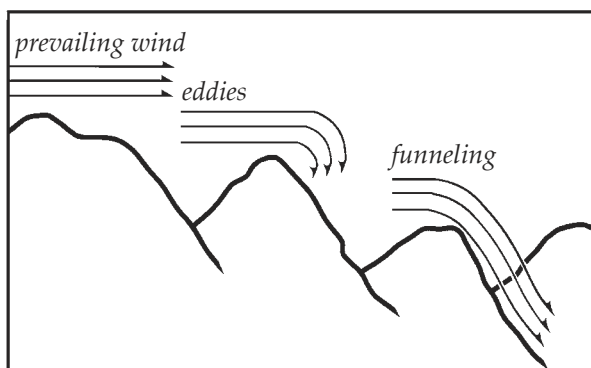
Crown separation is a more critical factor for fuelbreaks than a fixed tree density level. A *minimum* 10-foot spacing between the edges of tree crowns is recommended on level ground. As slope increases, crown spacing should also increase. However, small, isolated groups of trees may be retained for 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 H  
Colorado State Forest Service  
Minimum 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 include the following components:
  - A definition of the community's wildland-urban interface (WUI), preferably outlined on a map with an accompanying narrative.
  - A discussion of the community's *preparedness* to respond to wildland fire.
  - 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.
  - Identification of fuels treatment priorities, including locations on the grounds and preferred methods of treatment.
  - Recommendations regarding ways to reduce structural ignitability.
  - 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.

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