

Community Wildfire Protection Plan

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Prepared For

Donald Wescott Fire Protection District

By

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And

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The Donald Wescott Fire Protection District Community Wildfire Protection Plan was collaboratively developed. Interested parties, including Donald Wescott Fire Protection District residents, utility providers, El Paso County Sheriff's Office, and the Colorado State Forest Service participated and provided input to the process.

The CWPP identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will reduce wildfire risks in the Fire District. It also recommends measures to reduce the ignitability of structures throughout the District.

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

Donald Wescott Fire Protection District

Date

El Paso County Representative

Date

Colorado State Forest Service
Woodland Park District

Date

Table of Contents

	<u>Page</u>
Preface, INTRODUCTION AND ACKNOWLEDGEMENTS	5
Chapter 1, EXECUTIVE SUMMARY	6
Chapter 2, GOALS, PLAN COMPONENTS AND ON-GOING MAINTENANCE OF PLAN	8
• Goals and Objectives	
• Plan Components	
• Maintenance of the CWPP	
Chapter 3, BACKGROUND AND HISTORY	11
• Geographic and Ecological Location	
• History of Wescott Fire Protection District	
• Wildland Interface Impact Areas	
• Wildfire History	
Chapter 4, WILDFIRE HAZARD ASSESSMENT	20
• Methodology and Strategies	
○ Identification and Prioritization of Potential Fuel Treatments	
○ 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, EMERGENCY EGRESS	28
Chapter 6, SERVICES INFRASTRUCTURES, WILDLAND FIRE RESPONSES	38
• Professional Wildland Fire Response Services	
○ El Paso County Emergency Services	
❖ Hazard Response Plan	
○ Wescott Fire Protection District	
❖ 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 – Mountain View Rural Electric Association	
○ Natural Gas – <i>Black Hills Energy</i>	
○ Water Supply	
○ Wire-line Telecommunications – <i>Qwest</i> and <i>Comcast</i>	
• Post Fire Remediation	

Chapter 7, PUBLIC NOTIFICATION, COMMUNICATION AND SUPPORT	42
• Warnings and Hazard Notifications to the General Public	
• Services Communications and Support Systems	
○ Non-threatening Conditions	
○ Wildfire Condition	

Chapter 8, IMPLEMENTATION PLAN	43
• Public Education	
• Fuels Treatment	
• Support Systems	

APPENDICES

- A. Hazard Reduction and Mitigation Chart
- B. Senate Bill 100- HOA regulations
- C. CSU Publication 6.320, Creating Wildfire Defensible Zones
- D. Project Evaluation and Monitoring Sheet (Sample)
- E. Fuel Break Guidelines for Forested Subdivisions
- F. NWCG Safety Zone Criteria
- G. Permission for Property Use (Sample)
- H. CSU Publication 6.311, Managing Gambel Oak

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

INTRODUCTION AND ACKNOWLEDGEMENTS

The Donald Wescott Fire Protection District Community Wildfire Protection Plan (Wescott CWPP) is a broad plan focused on the protection of residents, structures and scenic environment of neighborhoods from catastrophic wildfires. The CWPP represents a collaboration of Colorado State Forest Services, Donald Wescott Fire Protection District, local, state and federal agencies. The CWPP is intended as a *living document* and will be updated as wildfire mitigation and firefighting methodologies and support technologies change. This CWPP follows the guidelines set forth in the *Health Forest Restoration Act of 2003* and the *Colorado State Forest Service Minimum Standards for Community Wildfire Protection Plans*.

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- Colorado Springs Fire Department
- Black Forest Fire Rescue Department
- The many residents of the fire district who took time from their busy schedules to guide this document to its completion

EXECUTIVE SUMMARY

The Wescott Community Wildfire Protection Plan (CWPP) is sponsored by the Donald Wescott Fire Protection District (DWFPD) for the safety of life and protection of property in neighborhoods throughout the fire district and immediate vicinity. Participation in the establishment of this CWPP was a broad stakeholder group including Colorado State Forest Service (CSFS), El Paso County Sheriff's Office of Emergency Services (EPSO), El Paso County Department of Transportation (EPDOT), El Paso Parks and Open Space (EPPOS), District 20 School District (D-20 Schools), Donala Water and Sanitation District (Donala), Academy Water and Sanitation District (AWSD), Black Forest Fire Rescue Department (BFFRD), Colorado Springs Fire Department (CSFD), Air Force Academy (AFA) personnel, utility providers and representatives of the Northern El Paso Community Organizations (NEPCO). Development of this CWPP focused primarily on wildfire hazard identification, fuel mitigation and emergency response. Fuel mitigations will focus on areas with heavy fuel densities and terrains that pose the greatest risk to life and property while 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 District is no stranger to wildfires and the need for wildfire prevention and protection. The proximity of Iron Mountain Fire (2002, 1,800 acres), the Buffalo Creek Fire (1996, 11,000 acres), High Meadows Fire (2000, 12,000 acre) and the Hayman Fires (2002, 138,000 acres) emphasized the fact that wildfires "*can happen here!*" The District 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 District has significant areas outside of their boundaries that could pose a potential wildfire fire threat to the community. These areas are described as the Wildland Urban Interface (WUI). With this CWPP, care was taken to propose mitigation within the District to provide fuel treatments to lower the risk of wildfire and to protect residents from potential wildfire intrusion from the adjoining WUI. Mitigation of fuels should be reviewed annually within the District for scheduling of treatments, with full completion to take from twelve to twenty years, depending on availability of funds from multiple sources.

Four primary strategies are employed to achieve mitigation: 1) Each neighborhood or community 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 District and other stakeholder agencies to require developers of stand-alone, undeveloped areas within zones surrounding the communities to mitigate their land before building occurs; and 4) support of on-going fuel treatment projects on federal, state and county properties.

This CWPP identifies the response, both from professional agencies and volunteer groups that may be employed for wildfire protection or suppression for areas within or outside the District. Wescott FD has the primary responsibility for protecting life and property in the District in the event of a wildfire. If a wildfire event is beyond their resource capability, the District is party to mutual aid and auto-aid agreements for support from other El Paso and Douglas County based fire departments.

The Wescott CWPP also discusses direct communication and informational networks to notify residents and keep them apprised of emergency 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 mitigation events. Projects deemed to have the most significant wildfire prevention impact will be given priority.

This CWPP is a “*living*” document that will be evaluated and maintained annually as a responsibility of the District. Each individual project identified within this plan should have a measured baseline; i.e., current condition description of its “*before*” profile that may be used to evaluate the effectiveness of any fuel reduction project performed 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 Wescott CWPP was developed for the safety of life and protection of property from wildfire emergencies within the boundaries of the District 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 Wescott CWPP addresses potential 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.

The Northern El Paso Community Organization (NEPCO) was utilized as the key community contact given their membership of over 35 community organizations. A representative of this organization was included in the partnership meetings as a liaison to the NEPCO board.

Goals and Objectives of the Plan- Values at Risk

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 promoting healthy ecosystems.
- Protect and enhance property values by:
 - Working within each community's covenants, conditions and restrictions.
 - Proactively addressing the insurability of all properties within the District.
 - Including aesthetic and privacy issues in fuel treatment prescriptions.

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 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 District for wildfire hazard(s) mitigation and response related projects.

Administration and Plan Maintenance:

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

Plan Components

The Wescott CWPP 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 District in the event of a wildfire emergency. Finally, Chapter 8 is the implementation plan, detailing public education, fuel treatments, mitigation priorities, timelines and funding methods, and support systems needed in the future.

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 Wescott CWPP 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 Wescott CWPP is meant to be a “*living document*” which is updated periodically to assure consistency in both wildfire prevention and planned response to wildfire situations both in District’s wildland/urban interface areas and outside the community.

Each year, at least three months prior to the Public Hearing for the approval of the District’s budget, the board of directors may formally request its Chief 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 District’s budget cycle. The overall evaluation and recommended changes to the CWPP will be presented and addressed prior to the budget adoption 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 District’s budgets for the following year.

Between the aforementioned board meeting and the formal updating of the CWPP each year, the DWFPD 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. NEPCO should be included in this list of key stakeholders, given the number of homeowner associations they represent. Each neighborhood or community association should be encouraged to develop their own plan that may then be incorporated into the overall District plan. These neighborhood plans do need to be redundant documents that duplicate the CWPP process. Specifically they should include on a map specific projects with an associated priority, and general prescriptions to meet the mitigation objectives. Once the District board and the key stakeholders are in agreement to the proposed changes and updates to the Wescott CWPP, those changes and updates will be available for public review and comment; either at a pre-announced public meeting or through the District’s website (www.wescottfire.org).

Formal CWPP evaluation will be done in conjunction with DWFPD 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 Wescott CWPP goals and objectives.

BACKGROUND AND HISTORY

Geographic and Ecological Location

The Donald Wescott Fire Protection District is located in Northern El Paso County, Colorado near Colorado Springs. Previously named El Paso County Volunteer Fire Department, the Donald Wescott Fire Protection District is named after a firefighter, Donald Wescott, who gave his life during an apartment fire in 1976. The department was incorporated in November of 1981. The DWFPD operates out of two stations that protect a combination of urban, suburban and rural areas. The ISO (Insurance Services Organization) rating for the department is a "5".

The Donald Wescott Fire Protection District boundaries are: Interquest Parkway north to Baptist Road, East of Interstate 25 to just east of State Highway 83, and along Highway 83 to Hodgen Road. The District includes the subdivisions of Liberty Heights, Trail Ridge, Flying Horse, Northgate, Northgate Highlands, Abert Estates, Gleneagle, Sun Hills, Struthers Ranch, Chaparral Hills and Pleasant View Estates, as well as unincorporated areas of El Paso County. The District serves approximately 25,000 people living within these boundaries. There are approximately 8,000 homes and structures within the District. The District also provides Automatic Aid to Black Forest, Tri-Lakes/Monument, Palmer Lake, Larkspur, Woodman Valley, and Colorado Springs Fire departments.

The southern portion of the fire district is currently covered by both DWFPD and CSFD. Emergency responses are treated as "automatic aid" events by both departments.

The general vicinity of the District is shown in Figure 1.

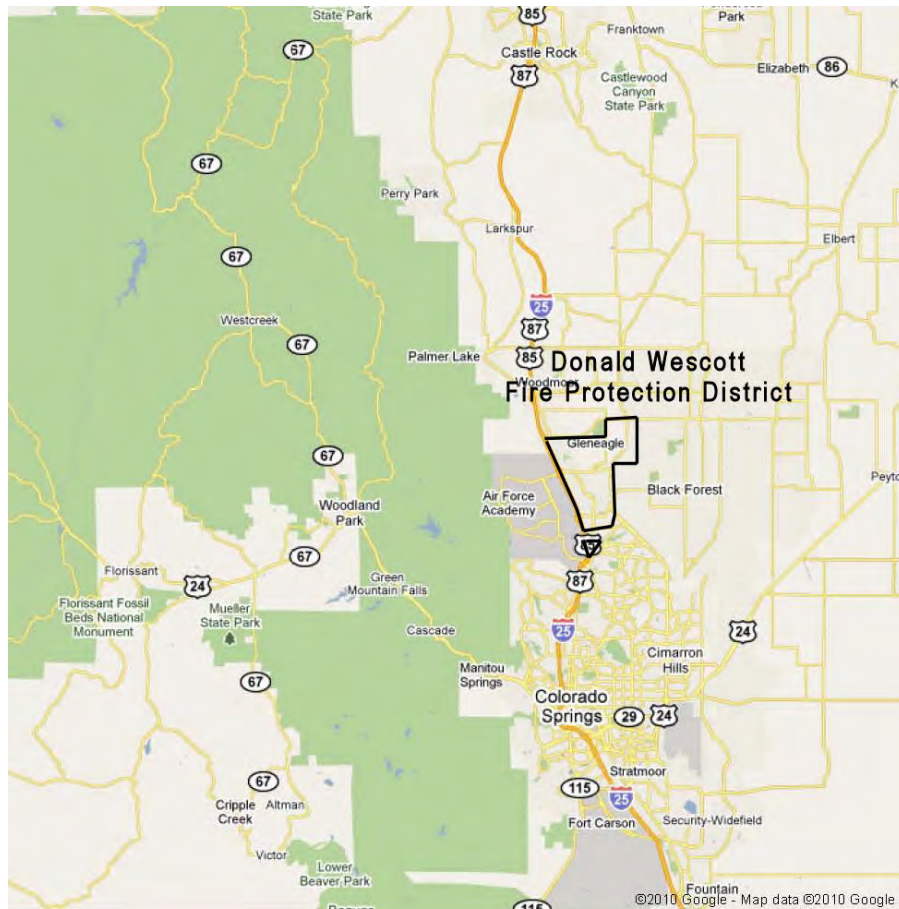


Figure 1. Vicinity Map

The District is a classic wildland urban interface community with high density residential communities surrounded by large lot holdings. To the northeast, the land rises up to the Palmer Divide at 7,500 feet above sea level. To the south, the District's lowest elevation is 6,620. Average elevation is approximately 6,800 feet, with gentle slopes to the southwest. Most of the District is considered accessible by forestry equipment. Vegetation consists of dense stands of Gambel oak, three-leaf sumac, mountain mahogany, ponderosa pine, and prairie grasses.

The area within the boundaries of the District is predominantly historic timber and grazing lands as part of early ranching and logging in the region. The area was first visited by the Stephen Long expedition in 1820. Heavy usage is evident given the presence of old ranch trails and logging stumps in forested areas. 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. Donald Wescott Fire Protection District has grown steadily with significant in-fill growth taking place over the last ten years. The District is shown in Figure 2.

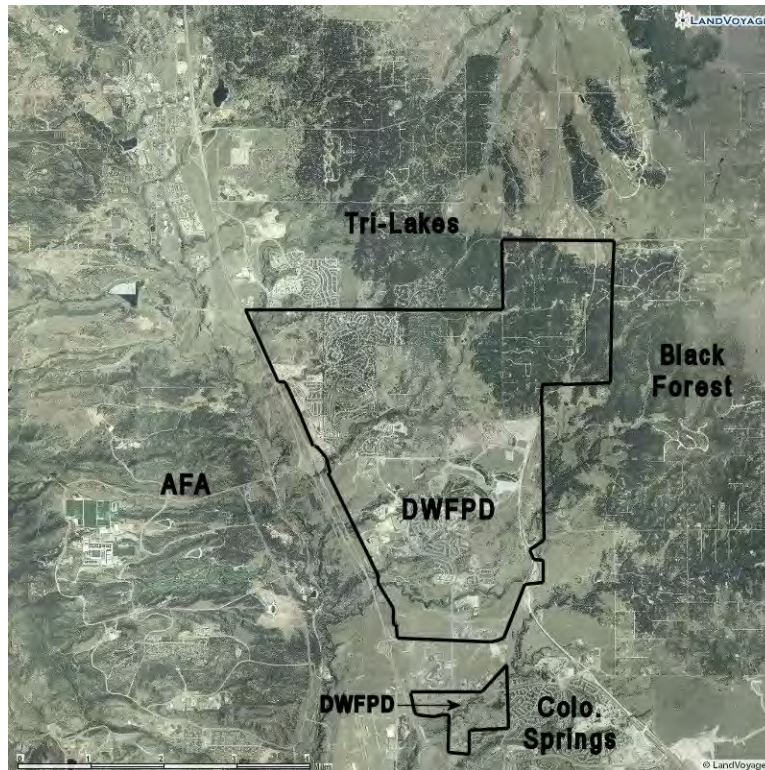


Figure 2, District Boundaries (approximate)

Wildfire mitigation began in earnest several years ago through use of on-duty firefighters for small mitigation projects and demonstration areas. A number of large, landscape scale fires have occurred in mountains west of the district since 1996 increasing the awareness of wildfire. The area is very prone to lightning and human caused fires.

Lack of forest management, recent droughts and unnaturally dense forests conspire to create a serious wildfire threat to the community. There have been several large fires in the area over the last thirty years, and all of them were of human origin. Largest was the Berry Fire from the late 1980s. This fire started in late April in the oak shrub lands south of Monument and burned the hills west of the present Monument Fire Center. The fire scar can be seen on the hillsides to this day.

In April of 2002, the Pine Glen Fire ignited when a landowner was mowing dry grass east of Vollmer Road. Fortunately, westerly winds pushed the fire away from the Pine Glen Subdivision and onto undeveloped ranch land owned by the Pineries Ranch. The fire was controlled after three days and scorched approximately 70 acres. That same week, there were smaller fires in the Glen neighborhood of Palmer Lake and another fire near the west end of Baptist Road that threatened homes in that area.

It is interesting to note that all of these fires started in April, indicating that the fire season in the area is a year round phenomenon. Even in winter, Chinook winds along the Front Range have resulted in wildfires with snow cover on the ground. Thankfully, this is a rare occurrence. As lightning scars as many trees attest there have been many lightning strikes and associated small fires, but these have been quickly extinguished. Records do not exist for these small fires.

Transportation planning has been an on-going concern of the District. All access points within the District connect to major thoroughfares. Roads within the District are operated and maintained by EPDOT, City of Colorado Springs and Colorado Department of Transportation (CDOT). Roadway surfaces are currently a mix of paved and gravel all-weather surfaces. Dust abatement is done regularly. Road widths are sufficient to allow two full lanes of travel in each direction. Road side ditches line all roadways and are mowed periodically by EPDOT or CDOT.

Water Supplies

The District has three water providers. Donala Water and Sanitation District provides water and emergency fire flows to Gleneagle, Fox Run and Fox Pines. Hydrant placement is generally every 500-1,000 feet. Colorado Springs Utilities provides water and emergency fire flows to all areas in the city limits. Hydrant spacing is usually every 500 feet along all city roadways. Academy Water and Sanitation District provides water and limited hydrant coverage to primarily the Pleasant View area. Several water storage tanks, in excess of 30,000 gallons, are found throughout the district where water is not supplied by a central provider. Water tank locations (blue pentagons) and ponds (blue stars) are shown in Figure 3.

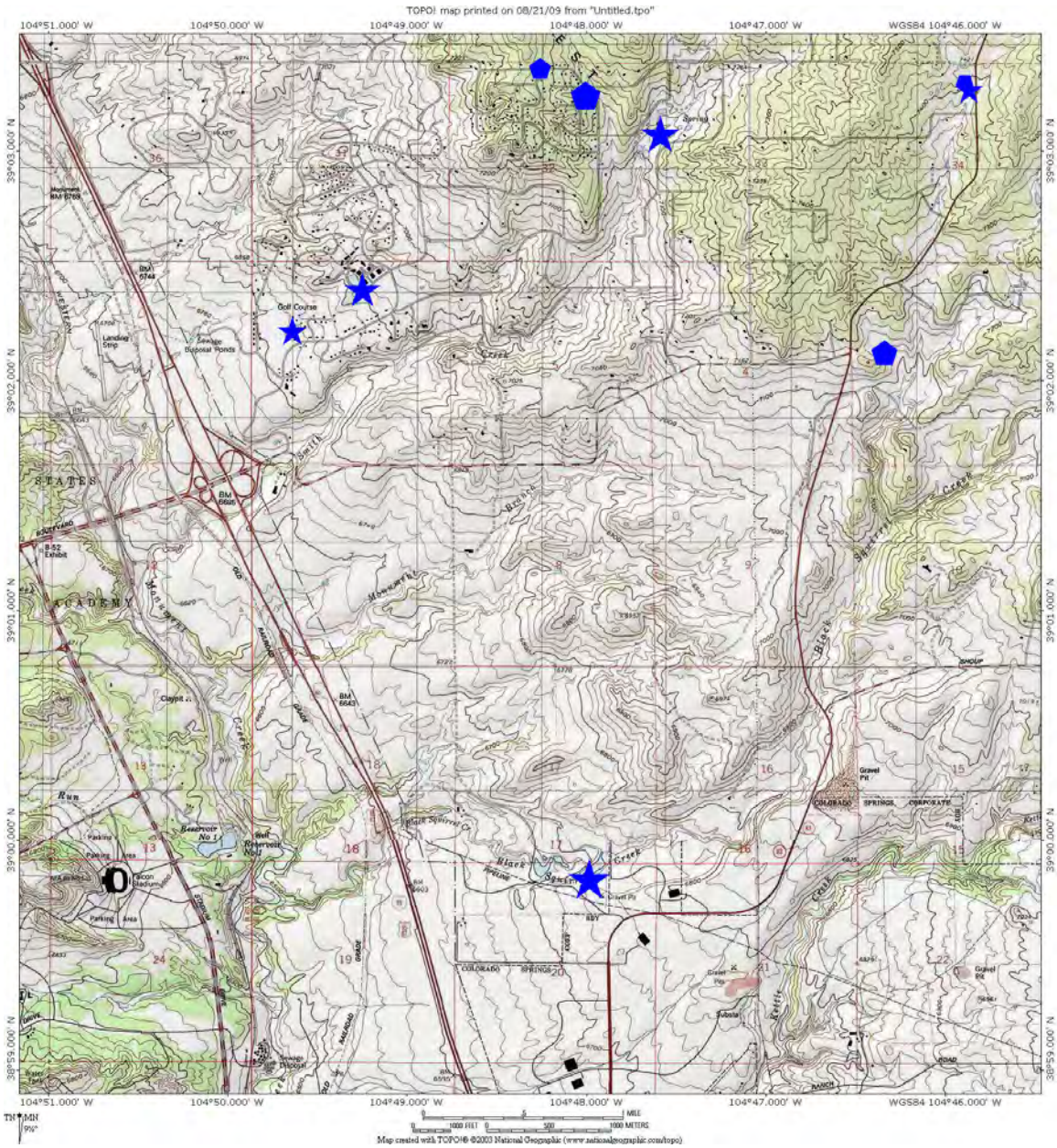


Figure 3, Water Supplies

The District periodically tests hydrants in cooperation with the water provider. This insures operability of the system. Potential upgrades to improve coverage will be discussed further in Chapter 8.

Schools

All schools are in Academy School District 20. There are currently four school campuses in the fire district. These are Discovery Canyon Campus, Da Vinci Academy, The Classical Academy, and Antelope Trails Elementary. Pikes Peak Community College has a campus located in a commercial area off State Highway 83. All schools are shown in Figure 4.

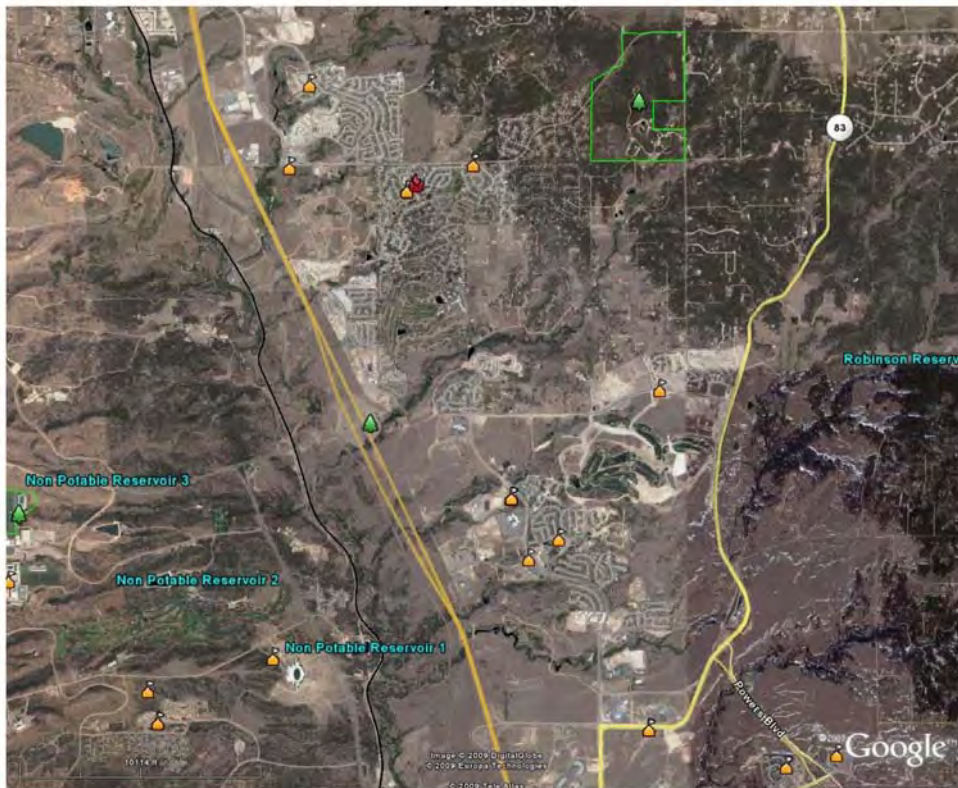


Figure 4, School Locations

Utilities

Overhead power lines, operated by Mountain View Electric Association, provide power to homes in all areas not in the City of Colorado Springs. Natural gas is provided by Black Hills Energy. Phone service is typically through Quest. Cable service is provided by Comcast Cable or through satellite providers. Underground power lines are common in the more suburban areas of the district such as Gleneagle, Northgate and Flying Horse. Wildfire issues will be addressed in Chapter 8.

Wildfire History

Over the past 100 years, DWFPD has avoided major wildfires. Small lightning and human caused fires have been typically suppressed quickly. Evidence was found in the community in the form of fire scarred logging stumps. It is estimated low intensity ground fires burned through the area with return intervals ranging from every 10 to 25 years. The remaining “stump record” indicates that pre-European ponderosa stands consisted of large, well spaced trees, pruned up by regular fires. The existing forest is considered a “second growth” forest impacted by 100 years of wildfire suppression. This has resulted in stands of dense ponderosa pines prone to greater risk of high intensity crown fires. The following photos were taken by William Henry Jackson in the early 1870’s, and show how natural fire affected the landscape prior to European settlement. These affects were often significantly fewer trees and less dense brush. A century of wildfire suppression has contributed to buildups of heavy fuels that now burn at higher intensities.

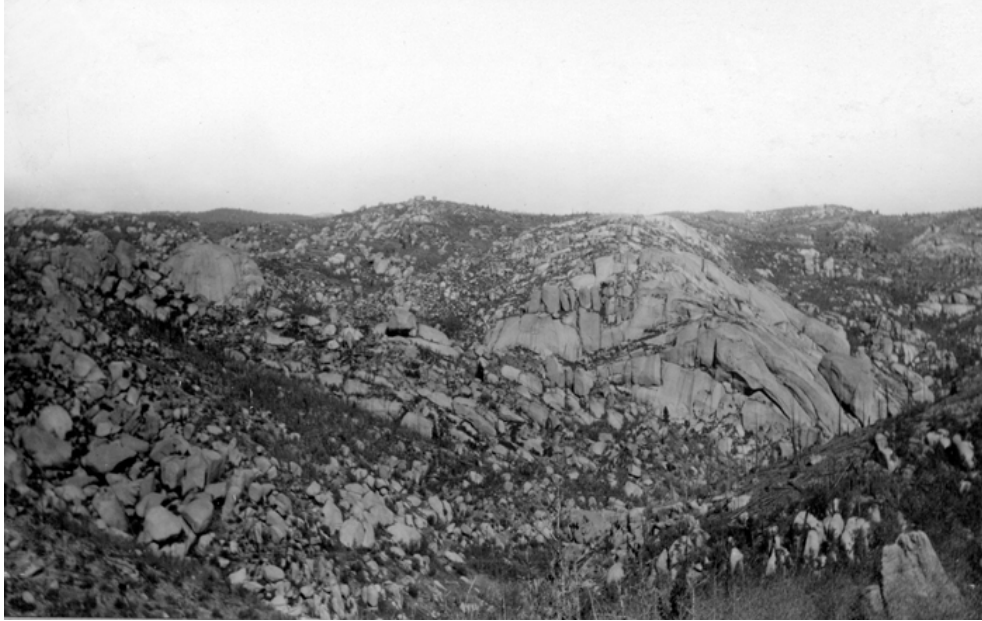


Figure 5, Foothills west of Palmer Lake, 1872, Photo by W. H. Jackson, USGS



Figure 6, Town of Palmer Lake, 1871, Photo by W. H. Jackson, USGS

Wildland Urban Interface (WUI) Impact Areas

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

The Wildland Urban Interface (WUI) for the District was set after meeting with local fire officials and CWPP partners. Two zones were established to allow prioritization of treatment areas that may impact the community. These are shown on Figure 7. WUI/CWPP Zones. These zones were set to aid federal, state, local, county and municipal agencies in targeting planning and funding for areas within one-half mile of wildland interface communities like those found in the District.

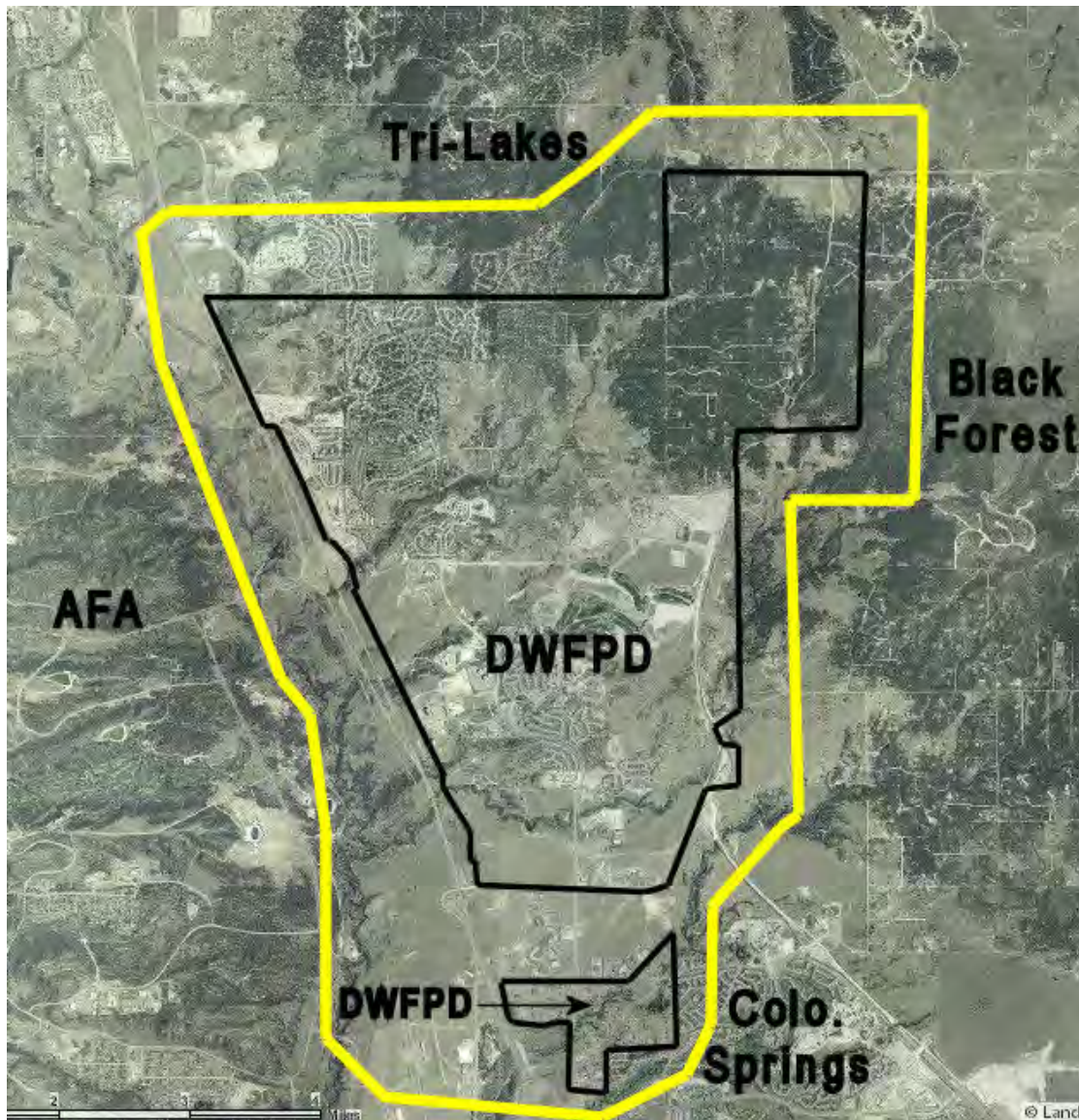


Figure 7. Land Ownership and CWPP Boundary

Zone 1

Zone 1 is the District shown in Figure 7, bounded by a solid black line. It consists of the community and is approximately 11,611 acres in size.

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 DWFPD and Colorado State Forest Service.

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. The recent passage of HB-1110 also allows a Colorado income tax deduction for wildfire mitigation work by homeowners who reside in a CWPP community.

More specific wildfire mitigation planning for Zone 1 is covered in Chapter 4.

Zone 2

Zone 2 is the adjoining the District. This zone is approximately $\frac{1}{4}$ to $\frac{1}{2}$ mile wide and approximately 11,539 acres that surround the District. The major owners within this zone are a mix of private owners and public ownerships. The entire western boundary of the District abuts the I-25 and the Air Force Academy. Stadium Boulevard was set as the western most boundary of Zone 2, per recommendations of Air Force Academy natural resource managers. Fox Run Regional Park falls within Zone 2 and has a significant impact on the District.

It should be noted that a minimum of five water providers could be severely impacted by major wildfire events in the zone. These may include the Donala Water and Sanitation District, Academy Water and Sanitation District, Air Force Academy, Town of Monument and the City of Colorado Springs. Other downstream providers could be impacted by reduced water quality from ash and silt flowing to Monument Creek.

More specific wildfire mitigation planning for Zone 2 is covered in Chapter 4.

Zone Totals

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

Zone 1- 11,611 acres

Zone 2- 11,539 acres

Total acres = 23,150 acres

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

WILDFIRE HAZARD ASSESSMENT

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

Methodology and Strategies

Wildfire behavior in District will be affected by fuel, weather and topography. No attempt was made to use fuel modeling for determining fire behavior for any one event. Instead, all areas will be treated as if fire can start at any point in or around the community and be affected by an infinite number of probabilities. Wildfire is capable of coming from any direction. Therefore, every home and all fuel treatment areas should be treated to allow for an inevitable fire that will burn at a rate and intensity that will not threaten structures or cause significant resource damage.

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

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

Four main “fuel types” are found within the District. Fuel models for WUI residents are often complicated and confusing. It is recommended these be simplified to “Low”, “Moderate” and “High” or “Severe” Hazards to aid the average homeowner in assessing his/her risk. These are summarized as follows (see Figure 8):

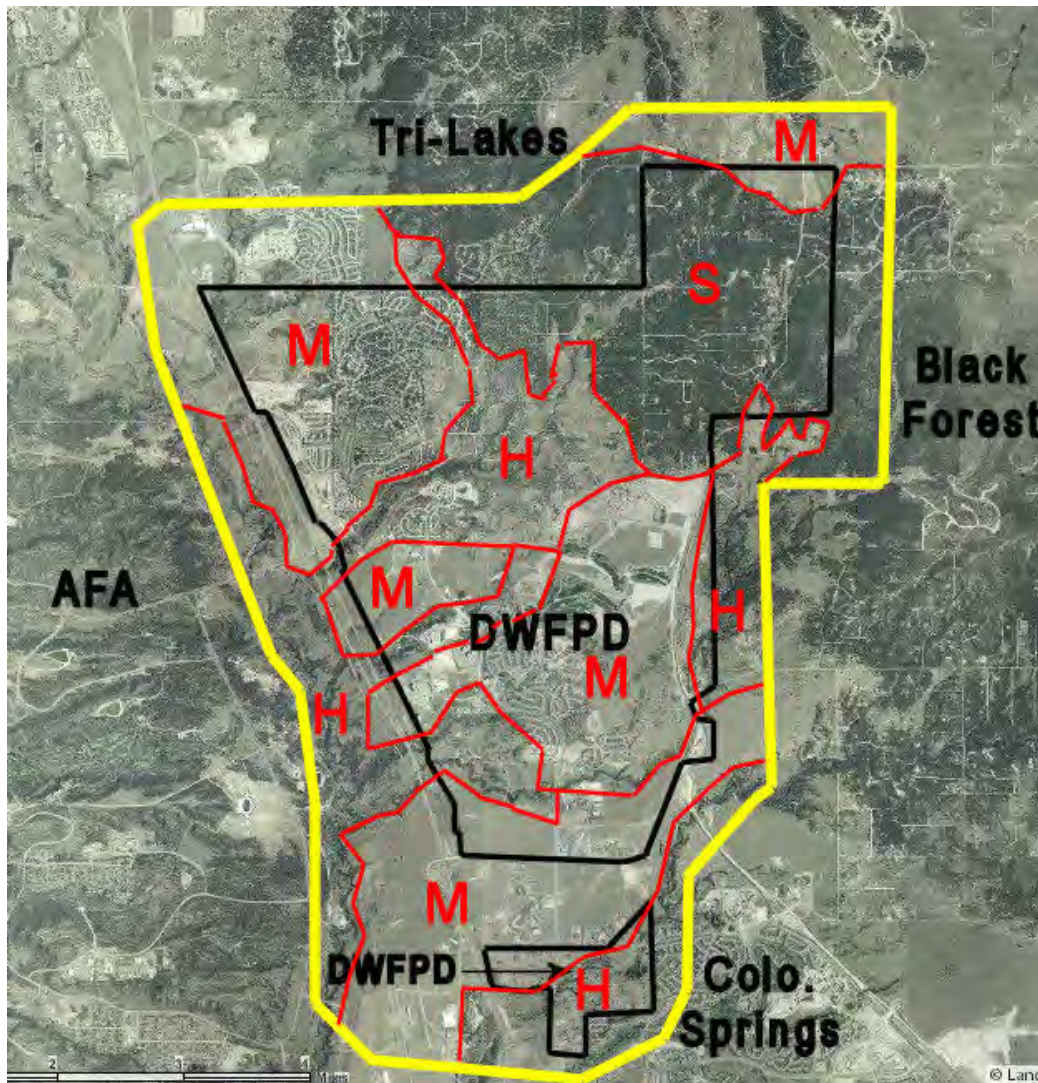


Figure 8, Hazard Rating Map

Fuel Types-

1. Grasslands, native prairie- Low to Moderate Hazard (NFDRS Type A/L, FBO Type 1)
Typically **light**, flashy fuels with scattered yucca, three-leaf sumac and noxious weeds. Occasional scattered ponderosa pines are present. See Figure 9.
 - a. Anticipated Fire Behavior- Flames $\leq 5'$ high, higher flare-ups rare; duration of flame lengths brief; fire spread slow to fast, 1-40 acres/hr; humans can usually occupy just-burned areas; spotting generally rare and short range. Steep topography will affect rate of spread.
 - b. Low hazard does not mean there is no hazard. Grassy areas should be kept mown or irrigated when close to structures.



Figure 9, Grasslands, Native Prairie

2. Open Pine with grasses- Medium to High Hazard (NFDRS Type C/T, FBO Type 2)
Typically scattered ponderosa pines with grass and light brush understory. **Moderate** understory fuels may be present that contribute to small areas of crowning. See Figure 10.
 - a. Anticipated Fire Behavior- Intermittent flare-ups occurring up to many feet above tree tops; short and medium range spotting common; behavior between flare-ups as in Grasslands; passing through fire front sometimes possible but chancy; parts of burned area can be occupied within half hour.



Figure 10, Open Pine With Grasses

3. Mature Brush- High to Severe Hazard (NFDRS Type B/O, FBO Type 4) Areas with **heavy** brush (gambel oak, three-leaf sumac and mountain mahogany) and scattered ponderosa pines. Brush affected by frost and drought kill. See Figure 11.
 - a. Anticipated Fire Behavior; Flames 5-20' high of brief duration; high rate spreads, at least 40 acres per hour; humans cannot safely pass through flames but can occupy burn area within about 15 minutes; short range spotting from blown embers common.



Figure 11, Mature Brush

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



Figure 12, Heavy Timber

A fuel map tied to stand and compartment numbering is shown in Figure 8.

Compartment/Stand descriptions are summarized in **Appendix A**

Topography and Fire Behavior

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

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

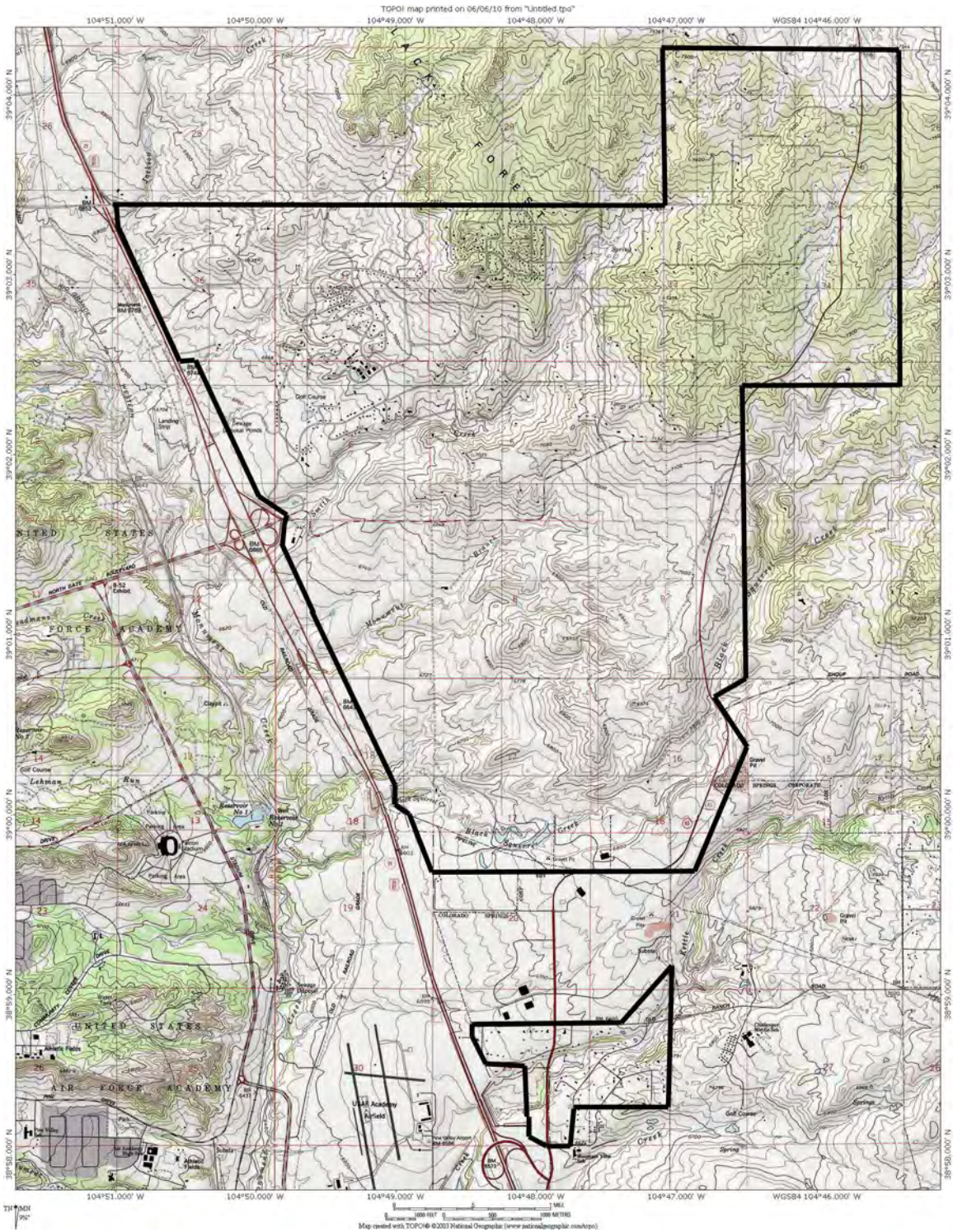


Figure 13, District Topography

Weather and Fire Behavior

The area is often affected by high winds from the west associated with frontal passages. Upslope weather patterns occasionally generate winds out of the south and southeast. Gusty winds

typically accompany thunderstorms which produce dry lightning. These gusty winds accelerate the spread of fires. Thunderstorm winds tend to be erratic in direction and speed posing one of the greatest dangers for firefighters.

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

Structural Ignitability

Wescott has begun home assessments for all homes in its jurisdiction. A number of homes in older neighborhoods have wood shake roofs. Homeowners should be encouraged to change these to a Class A roofing material less prone to ignition. These homes will also pose a threat to neighboring homes. Fire brands, or embers, can easily ignite shake roofs well away from a wildfire front. Currently, there are no incentives to encourage shake roof owners to change, other than increased insurance costs. It may be possible that in the future, homeowner insurance will be difficult to obtain for shake roofs due to fire and hail exposure. There are currently restrictions by the district requiring shake replacement should a homeowner decide to out re-roof. Any new shake roofs are prohibited.

Many homeowners have implemented some level of wildfire mitigation. However, most are not considered fully Firewise at this time. In some cases simple mowing provides an initial level of treatment. All homeowners, even those well away from native vegetation, should learn measures to protect their homes from fire brands (see Appendix C for recommended standard). Fire brands can be lofted high into the air and carried up to a mile, placing all homes in the community at risk. Prevention measures can be as simple as regular mowing of high grasses or by periodic irrigation. Landscaping, using Firewise plants (CSU Extension Publication 6.305 and available at www.csfs.colostate.edu), is recommended in all areas. Junipers and other flammable vegetation are readily ignited by fire brands lofted into the neighborhood.

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

Emergency Egress

Multiple ingress and egress points are critical to public safety. Egress is needed for residents to evacuate and ingress required for emergency services. The need for multiple egress points in ensuring 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 recommended for most communities (*Public Safety in the Urban-Wildland Interface: Should Fire-prone Communities Have a Maximum Occupancy?* Thomas J. Cova, Natural Hazards Review, August, 2005). It is also important to note that "bottlenecks" may occur within the community if all traffic is directed to only one entrance.

A recent quote by Jack Cohen, Fire Scientist with the USDA Forest Service noted that, "Long evacuation routes are NO evacuation routes." (Personal quote made at the 2006 National Wildland/Urban Interface Fire Education Conference, 11-4-06, Denver, CO). Long ingress/egress routes in excess of 800-1,000 feet, without multiple access points, are often prohibited by more modern land development codes. These codes recognize that emergency ingress/egress can be hindered by long evacuation routes.

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.

The more recently built out areas of the District have more direct ingress/egress routes that connect cleanly to State Highway 83, I-25, Baptist Road, Voyager Parkway and Northgate Road. Neighborhoods located on the Colorado Springs portions of the District follow current guidelines requiring multiple ingress/egress routes. The Flying Horse development is a good example of this with a number of well developed roads connecting to Highway 83.

Older neighborhoods, such as Gleneagle and Pleasant View, typically have more than one ingress/egress route. But, narrower street widths, winding and curving alignments, and outdated signage could lead to some level of confusion during an evacuation.

Several routes lead through and out of District to Interstate I-25 or State Highway 83. Other major thoroughfares for use in a wildland fire emergency may include Northgate Road, Struthers Road, Voyager Parkway and Baptist Road. These are shown in **Figure 14**. If multiple incidents occur, the Colorado State Highway Patrol and Colorado Department of Transportation (CDOT) should be contacted to assist in reducing conflicts.

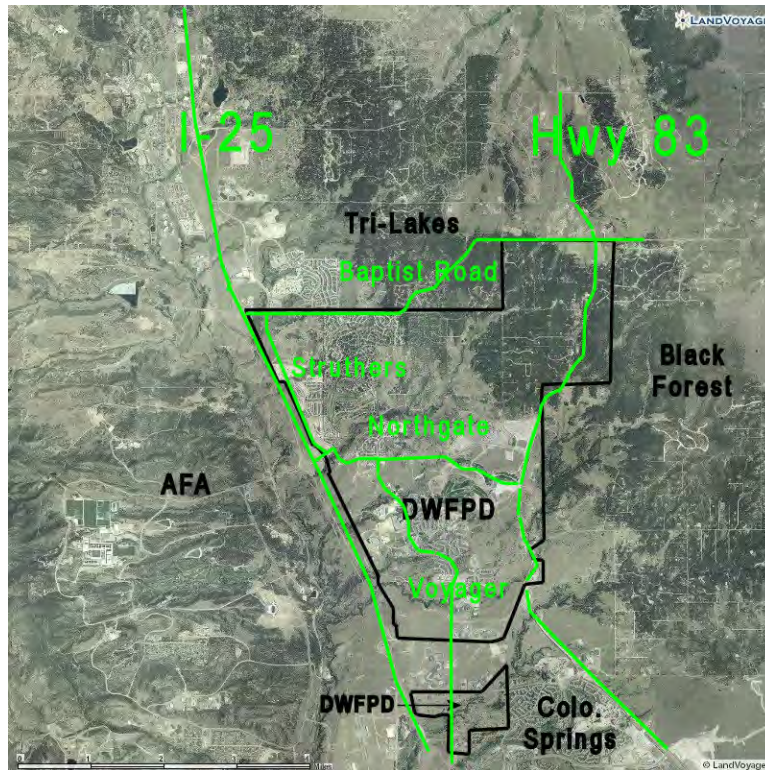


Figure 14, Main Evacuation Routes

Creating secondary access out of older neighborhoods 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 that can allow residents to remain temporarily when emergency services may be trying to enter the neighborhood. Efforts should be made to work with the El Paso County to see if alternate access is possible into areas with limited access.

The most problematic area of fire district is described as “Pleasant View”. Narrow, heavily tree-lined roads with steep grades and blind curves could create potential bottlenecks during evacuation of these neighborhoods. Homes are densely packed together amid heavy fuel volumes of mature ponderosa forest. Routes leading to the northwest lead into areas of potentially heavy traffic in the west part of district. Routes to the east (Rollercoaster Road) lead to areas of heavy fuel volumes. Routes to the southwest and southeast are in areas of lower fuel volumes (grasslands). The Pleasant View is shown in **Figure 15**.



Figure 15. Pleasant View Area

A second neighborhood of concern is Sun Hills. This neighborhood is a low density community with a mix of grasslands and heavy Gambel oak. Roadways are generally wide and well maintained. This is shown in Figure 16.

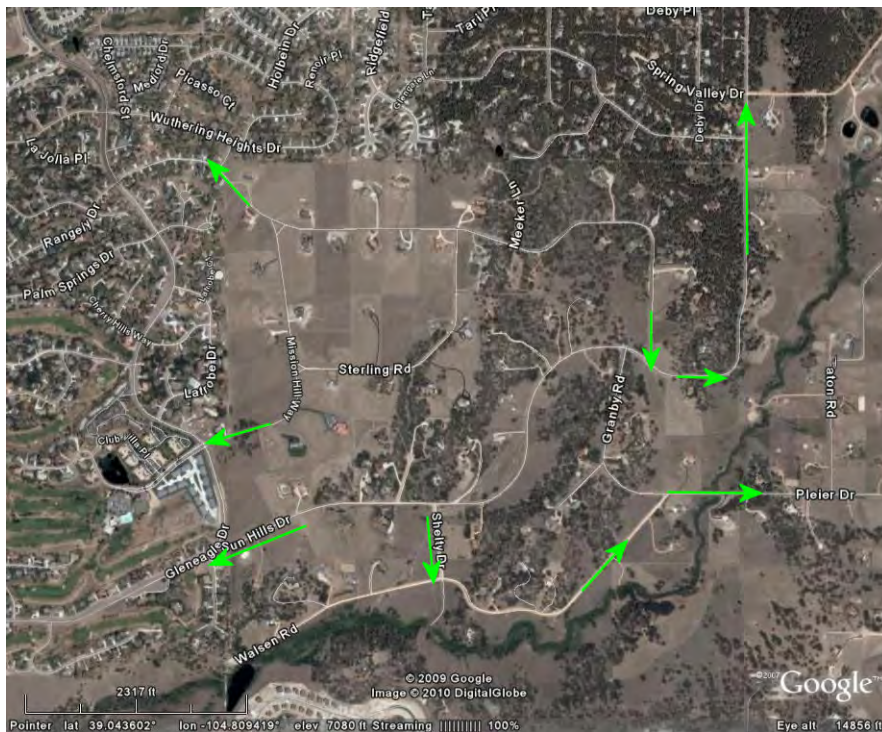


Figure 16, Sun Hills Neighborhood

The third neighborhood of concern is Gleneagle. This community is composed of dense housing with winding and often confusing streets. A high percentage of homes have wood shake roofs, and are close enough to each other that structure-to-structure ignitions will be an issue. Pockets of heavy fuels in the form of Gambel oak are present, along with unmown greenbelts set aside as natural areas.

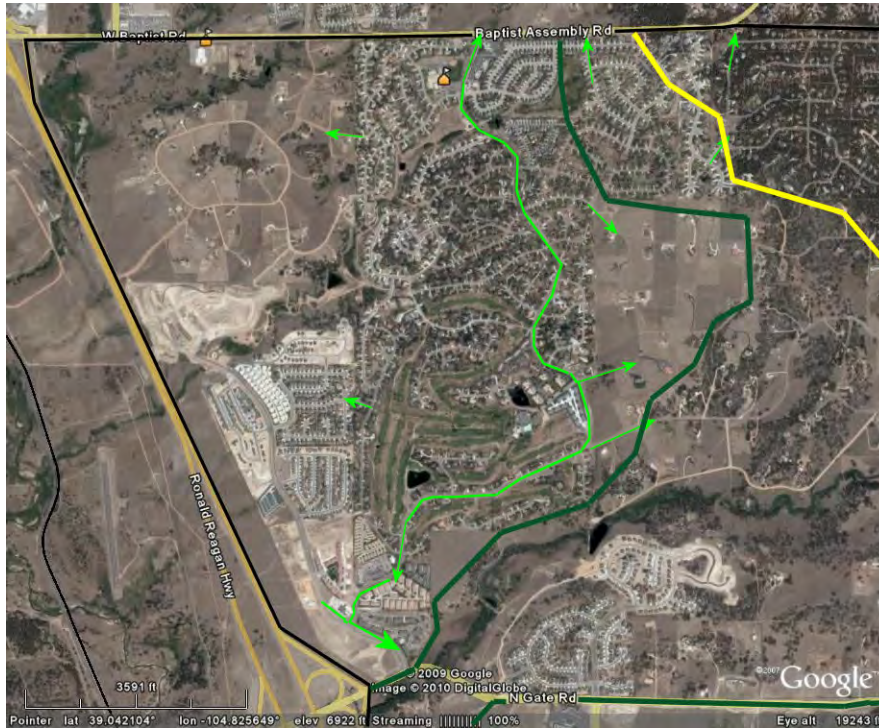


Figure 17, Gleneagle Area

Other areas of the District that are of concern are smaller neighborhoods that feed onto Rollercoaster Road. Dense fuel volumes on each side of the road, combined with limited sight distances may complicate evacuation from these areas. These are shown in Figures 18, 19, and 20.

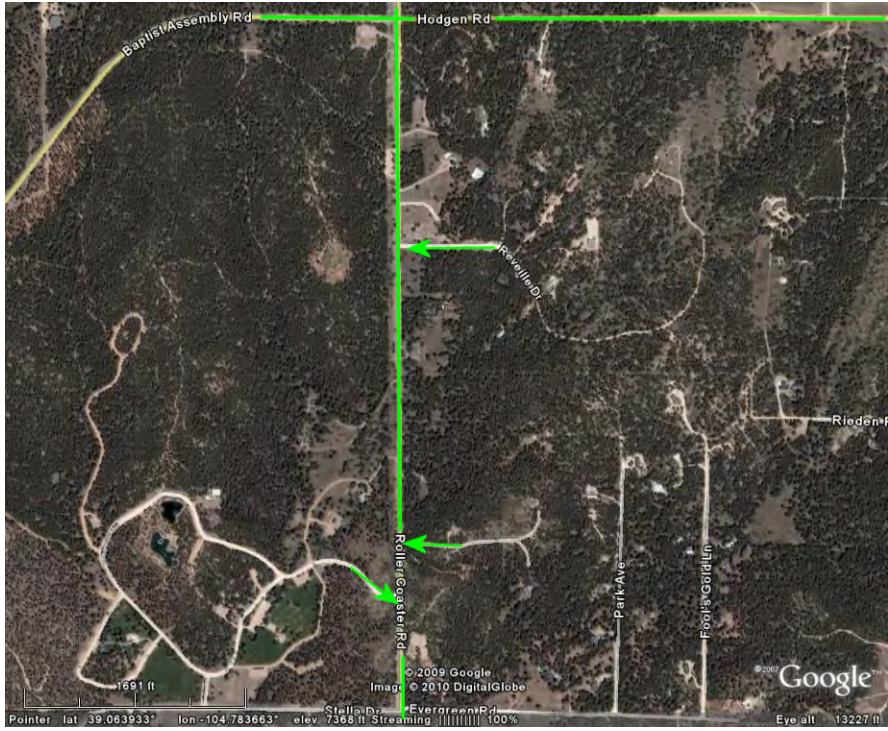


Figure 18, Rollercoaster Road (north section)

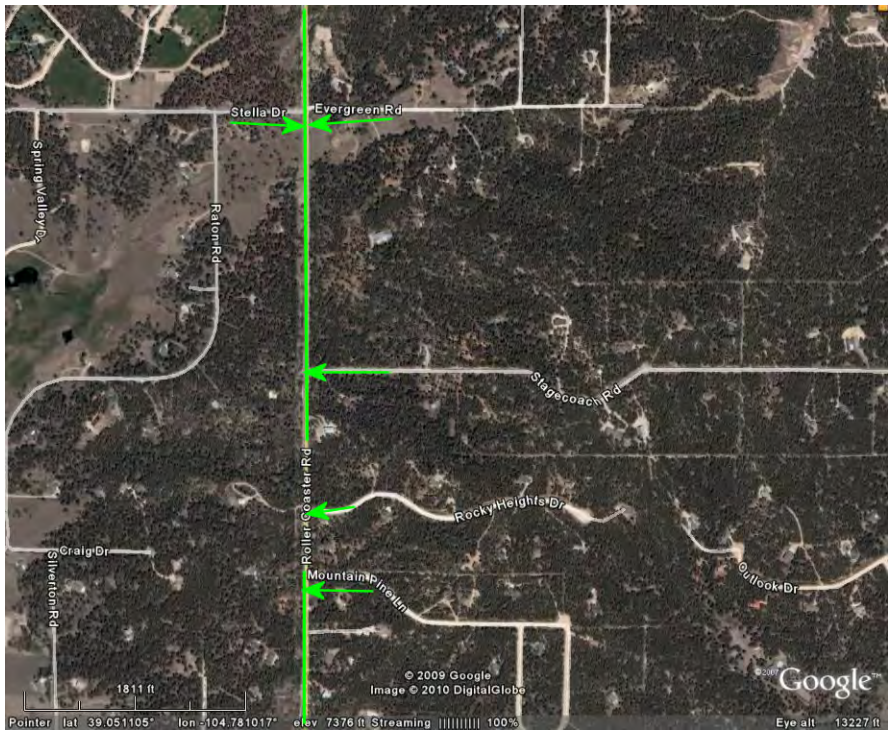


Figure 19, Rollercoaster Road (middle section)

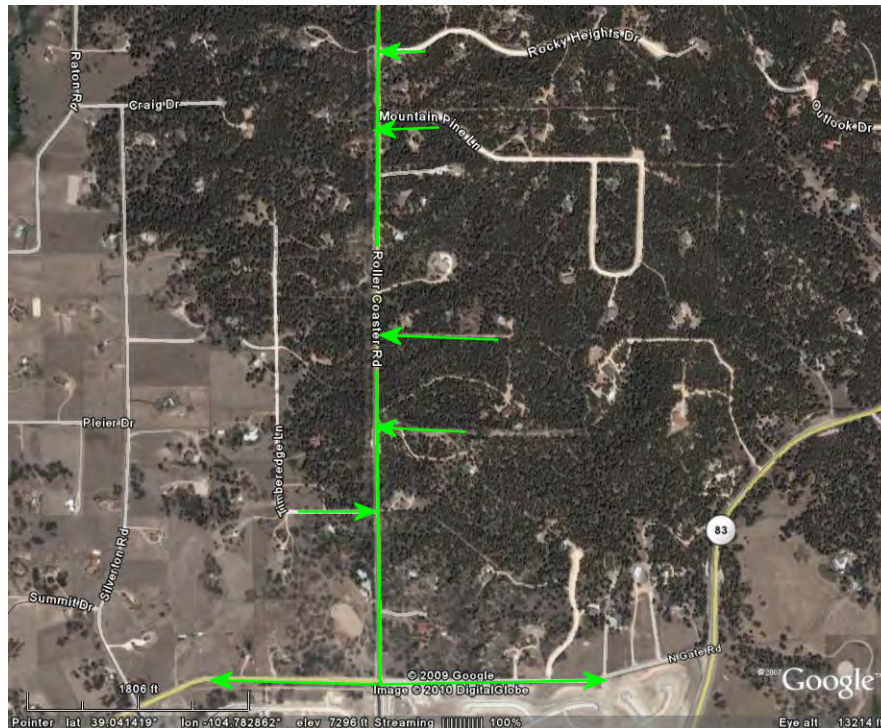


Figure 20, Rollercoaster Road (south section)

Overall, other neighborhoods in the District have sufficient ingress and egress points to major thoroughfares.

Property Addressing

The District should encourage all property owners to install address markers that are clearly visible from the traveled way. These should be:

- All letters and symbols should be a minimum of 4 inches in height with a ½ inch stroke, and should be reflectorized and contrasting with the background of the sign.
- Signs should be visible from the road and not mounted more than 6-8 feet higher than the roadway surface.
- Signs should be visible from both directions of travel.
- Non-flammable sign materials are recommended.

Civilian Staging Areas

Figure 21 shows areas that could serve as potential staging areas for civilians to temporarily escape from a fast moving wildfire in areas with heavier fuels (trees, brush, etc.). These are areas with light fuels (primarily grasses) and good distances from heavy fuels. Civilian staging areas are intended to aid emergency responders in directing evacuees to the safest evacuation route for the wildfire event. Staging of evacuation can also create opportunities to allow additional responding out-of-district resources to access the area safely. The following is a list of recommendations for implementing future civilian staging areas:

1. Areas shown on **Figure 21** may not be suitable for all wildfire events. Each area should be assessed using NWCG (National Wildfire Coordinating Group) Safety Zone Guidelines when possible. The ability to “burn out”, grade, or mow fine fuels to improve utilization should be determined prior to establishment as a civilian staging area.

2. Right-of-ways leading to designated areas should be mowed regularly to a maximum grass height of six inches.
3. Routes to temporary staging areas should be treated to reduce fuel volumes. Fuels should be reduced to levels that will reduce flame lengths across thoroughfares.
4. Signage is suggested. Signage used in canyon areas where flash flooding is common can be used as an example.
5. Education is critical. Mailings, web site maps, utility bill enclosures, and flyers can be used to alert affected owners of problem areas.
6. Cooperator agreements should be considered with landowners adjacent to potential Civilian Staging Areas for timely mowing of fields and meadows.
7. Publicly owned properties should be mowed as determined by the Fire Department.
8. The Discovery Campus is listed as a potential staging area. Meetings should be held annual with School District 20 to re-affirm its use as a civilian staging area. Concerned parents attempting to pick up their children at the school will add to the confusion of an evacuation effort. A cooperative effort between the fire district and the School District is recommended so parents are aware of how children will be evacuated to a safe area utilizing district resources.
9. Pets and animals will be an area of concern for some residents. Livestock (horses, cattle, llamas, alpacas, donkeys, ostriches, etc.) are typically loaded into trailers which have the potential to further clog roadways. These can be staged in the same areas for later transport to safe zones well outside of the affected area. Kennels, veterinarian clinics or other boarding facilities should have a pre-plan for their animals.

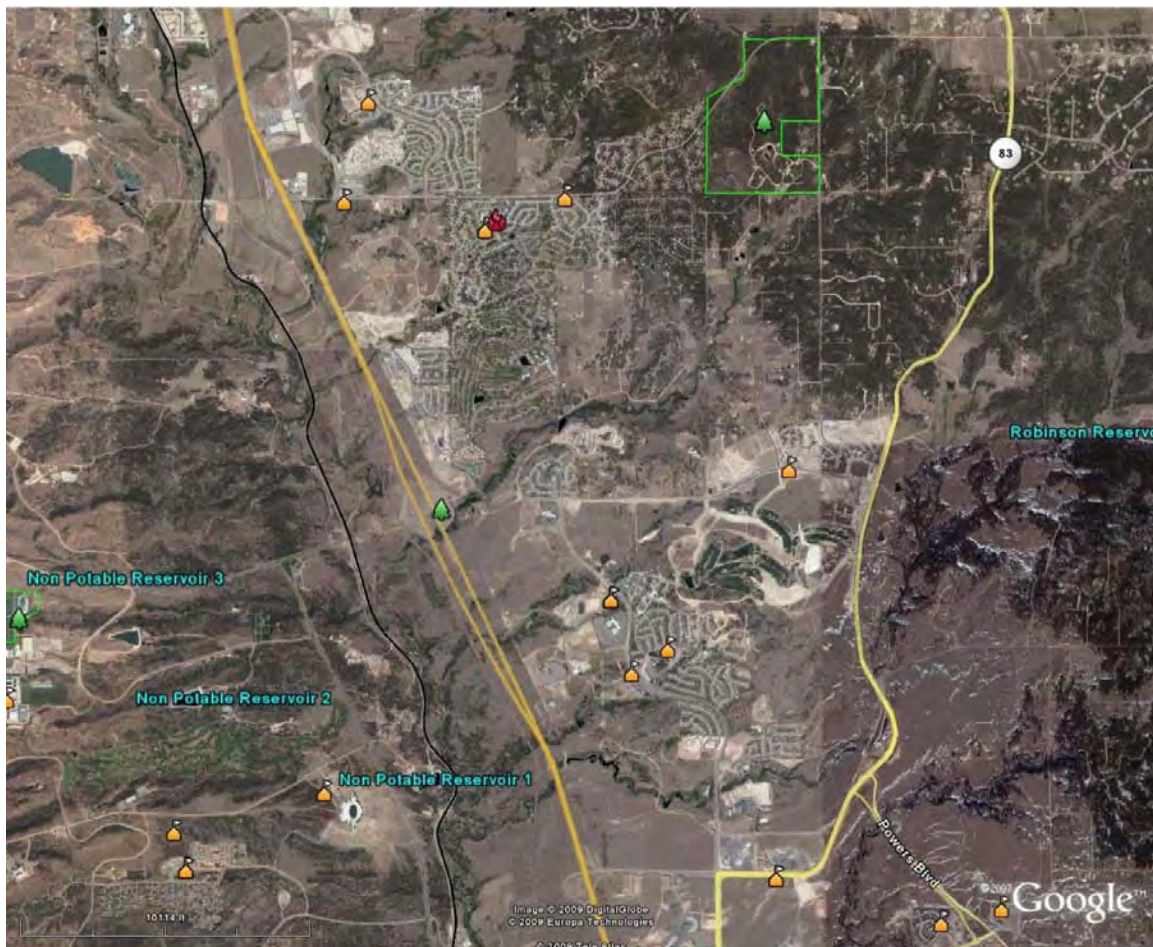


Figure 21, Schools and potential Safety Zones.

Schools

All schools in the District should investigate "shelter-in-place" as an option during wildfire events. Efforts to evacuate children will complicate access by emergency services providers. District 20 is currently upgrading its communications system to allow interoperability with other emergency providers that will allow joint decision making on whether a particular school should be evacuated. The school district already has a communication plan in place for contacting parents during emergencies. This can be utilized to keep parents informed as needed.

The only school in the fire district recommended for some level of fuel treatment is The Classical Academy. The area north of the school has heavy fuels within what could be considered the "ignition zone" of the main school building. This area is not school property and would require cooperation of the neighboring owner for any planned fuel modifications.

Fire Fighter Safety Zones

Areas should be identified that may allow fire fighters to remain within or adjacent to affected neighborhoods. All are event driven and should be assessed for suitability by the responding fire teams. NWCG Safety Zone Guidelines and LACES (Lookouts, Awareness, Communications, Escape Routes, and Safety Zones) Checklist should be followed.

Fire Fighter Staging Areas

Areas have been identified that can be used for staging of fire fighting resources and Incident Command Posts (ICP). All meet the following criteria:

1. Meet guidelines for NWCG Safety Zones.
2. Located within built or heavily maintained environments.
3. Good access to main collector routes identified.
4. All weather driving surfaces with adequate turning radii.
5. Hydrants are within reach of drivable surfaces.
6. Do not contain significant natural or man-made hazards.
7. Could also serve as civilian safety zones.

Locations of the Staging areas are as follows:

- Discovery School Campus.
- Commercial sites within areas of low fuel volumes.
- Fox Run Regional Park main entrance.
- Flying Horse development.
- Gleneagle, south entrance at commercial zone.
- New Life Church.

Helicopter Landing Areas

Two areas were identified for use by helicopters. If these have not been used by the Monument Fire Center in the past, then they should be listed as current resources through USFS Pueblo Dispatch. The first is at the Fire Center west of Monument. The second is the Discovery Campus.

Protect In Place (PIP)

Limited access and sub-standard egress routes in heavy fuel areas may force homeowners to consider protect-in-place (PIP) 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 PIP conditions are met, evacuation orders from fire authorities should be followed. The decision to protect-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 protect-in-place must be met well in advance of a wildfire. No homes in the District are currently designated as protect-in-place. It is not possible or safe to attempt to create “stand alone” conditions during a wildfire. An unprepared property owner who attempts protect-in-place could compromise the safety of the homeowner and firefighters. Furthermore, creation of stand alone conditions requires a great deal of advance planning and coordination between the landowners, fire professionals and resource advisors. The landowner should also be aware of both physical and mental scars that may be caused by exposure to an extreme fire event.

This recommendation to protect-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.

Protect-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.

Again, it should be noted that no homes within the Donald Wescott Fire Protection District have been identified as either protect-in-place or fire fighter safety zones.

SERVICES, INFRASTRUCTURES, WILDLAND FIRE REPONSES

This section of the Wescott CWPP details professional and voluntary resources available to respond to emergencies associated with wildland fires impacting the district's residents and structures. Professional responders are always the front line in addressing wildfire, rescue and medical emergencies.

Professional Wildland Fire Response Services

For wildland fire emergencies endangering residents, the first line of response is Wescott Fire Assistance is available through Automatic Aid and Mutual Aid agreements from both within and outside El Paso County. All fire personnel cooperate under a common command structure, according to the principles established by the Incident Command System (ICS).

El Paso County Emergency Services

The El Paso County Sheriff's Office (EPSO), through the Deputy Fire Marshal, maintains several capabilities to assist local fire departments. A local Incident Commander (officer in charge of the fire) may request any, or all, of the following:

- The EPSO Wildland Fire Suppression Team is a volunteer wildfire crew that can deploy up to three brush truck crews, function as a hand crew, or provide specialized incident management skills. The team also provides wildfire and incident management training to area fire departments.
- The Mobile Command Post can provide work space and enhanced communications for six to eight fire commanders.
- The El Paso County Emergency Operations Center (EOC), is a dedicated command center located in downtown Colorado Springs. When activated, EOC staff can mobilize other county and community resources, and request assistance from other counties or the state. The EOC is one of the main functions of the El Paso County Office of Emergency Management, which is part of the Deputy Fire Marshal's office.

City of Colorado Springs Emergency Services

Since a significant portion of the District is within the City limits, the Colorado Springs Fire Department may well be involved. Mutual aid agreements and operating guidelines have been established between DWFPD and CSFD.

Mutual Aid and Automatic Aid

In the event of a wildland fire, WFPD operates under a mutual aid agreement for providing equipment and personnel assistance, if able and available, among its fire fighting agencies (see Appendix I). The agreement encompasses fire departments from El Paso, Douglas and Teller Counties, City of Colorado Springs, US Air Force Academy, and Fort Carson Fire Departments. 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, EPOEM 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.

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 El Paso County, Douglas County or from Teller County. Out of county local government resources will be coordinated and

placed by either the Incident Commander, Colorado State Forest Service Fire Duty Officer and/or County Office of Emergency Management.

Wescott Fire Protection District

DWFPD firefighters are the first responders to a reported wildland fire threatening the environs surrounding and interior to the District. The District has two stations: Station 1 located at 15415 Gleneagle Drive and Station 2 at 1500 Sunhills Drive. Land has been acquired for a third station to be constructed at the intersection of State Hwy. 83 and Stagecoach Road.

The staff consists of 11 full-time, part-time firefighters and 35 active volunteer professionals. In a cooperative arrangement with American Medical Response (AMR), the district provides Advanced Life Support and ambulance transport services for the district and north Colorado Springs area.

Wescott supports the community with a variety of programs: CPR and First Aid classes, Fire Safety Inspections, EMS and Fire coverage at numerous local events, as well as conducting station tours and fire safety programs and training within the stations. Members of WFPD hold State and National certifications in specialties like hazardous materials, safety, emergency vehicle operations, and ice and water rescue.

The overall equipment resources of WFPD are:

Equipment-

- Type 1 Engine- 2
- Type 4 Engine- 2
- Type 6 Engine- 2
- Water Tender- 1
- All-terrain utility/command vehicle- 1

In the event WFPD personnel and equipment resources become exhausted, first reinforcement mutual aid calls are Tri-Lakes Fire Protection District, Larkspur Fire Protection District, Black Forest Fire Rescue, and Colorado Springs Fire Department followed by other County Fire Departments and El Paso County Sheriff's Office Wildland Fire Suppression Team.

The first strategy for fighting wildland fires endangering the district is *direct attack and suppression*. If direct attack is not an option, then a defensive posture will be taken. Engines will be stationed at the most defensible structures first. Structure prep should include closing up structures, placing hose lines into use and removal of fuels around homes. Black lining, if necessary or appropriate, should be accomplished quickly and safely.

Emergency Medical Services

Wescott provides first response emergency medical services to the district. The list below is the breakdown of the district emergency personnel resources and staff.

- 11 Full-time fire fighters
- 1 Administrative assistant
- 35 Volunteer fire fighters as of January 2008

Academy School District 20

The Academy School District 20 has numerous emergency procedures in place. These include parental notification systems and emergency planning for all schools in the Fire District. District 20 has also upgraded its communications systems to interface with local emergency service providers. The Discovery Campus has been designated as a potential staging area and refuge zone should a major wildfire threaten the area.

Water Resources

Wescott currently has emergency water supplies located throughout the district. There are three water providers within the district. Other supplies may be available if needed through the use of small bodies of water close to or in the district. A map of water storage facilities will be added upon update of the CWPP.

Civilian Staging/Fire Fighter Safety Zones/Staging Areas

During emergency situations, it may be necessary for residents and emergency services providers to reach a safe place that is outside of the affected part of the community. Wescott, in conjunction with other wildfire authorities, recommends establishment of Civilian Staging areas outside the communities. 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 Civilian Staging Areas may be used by firefighters for staging areas or fire fighter safety zones for marshalling resources within the community.

All neighborhoods and communities should learn their quickest routes to Colorado Highway 83, I-25, Baptist Road, Northgate Parkway and Voyager Parkway. These will serve as the major routes to refuge zones and staging area for residents. For these to be effective, signage/posting will be needed. An annual educational campaign should be established. Posting on these locations will be essential. Mail kiosks can also be used as posting places.

Internal Volunteer Services and Communications

The district does not currently support any volunteer and paid groups, other than district staff, that can be used in communication support or augmentation of professional first-responders within neighborhoods in the event of a wildfire emergency. It is strongly recommended that the Board of Directors implement operating agreements with the district that allow for use of Homeowner Association (HOA) properties and facilities during emergency situations.

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 El Paso County web sites. The El Paso County Sheriff's Office (EPSO) may also have an emergency phone line set up to provide information.

Wescott should develop an emergency response plan for interaction with emergency services providers. This needs to be developed prior to emergencies and allow access for key community

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, and office staff).

The District is considering formation of volunteer organizations that could provide additional support. These include an Explorer Post and Auxiliary. If formed, these should fall within an area command or ICS unified command structure.

Critical Utilities

In the event of a wildland fire impacting the district, WFPD or EP-OEM 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. EP-OEM, through its dispatcher, is able to provide direct contact with the railroad in the event trains should be stopped to allow evacuation of civilians.

Public and Emergency Response Personnel Safety

Beyond the 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:	<i>Black Hills Energy</i> Emergency Service Telephone Number: (800) 303-0357
Electrical Power Services:	<i>Mountain View Rural Electric Association</i> Emergency Service Telephone Number:

Direct Support

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

Water:	<i>Water Districts:</i> 1) <i>Donala Water and San. District</i> 2) <i>Academy Water and San. District</i> 3) <i>Colorado Springs Utilities</i>
Wire-line Communications:	<i>Qwest Communications:</i> Emergency Service Telephone Number: (800) 573-1311 or 1-800-603-6000
	<i>Comcast</i> 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.

PUBLIC NOTIFICATION, COMMUNICATION AND SUPPORT

Communications to the general public are classified 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

Emergency notifications concerning a specific wildfire or wildfires directly threatening communities can be authorized only by Donald Wescott Fire Protection District, or the El Paso County Sheriff's Office. Such a warning can be issued in a variety or combination of methods and will generally contain *action* information for residents. 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. In the event of an evacuation, The Sheriff's Office typically distributes evacuation information in the following ways:

- GeoCast telephone notification system (commonly called "reverse 911")
- Local news media
- Whenever possible, Sheriff's deputies go door-to-door to ensure that all residents have been warned

Services Communication and Support Systems

Non-threatening Conditions

Informational notifications of are done for public meetings, events and general services. Several mediums are used for general public notifications including Board of Directors "notice of meetings", general letter mailing, flyer posting and utility bill inserts. The district's web site is also used for general information (www.wescottfire.org)

Wildfire Condition

In the event of an actual wildfire impacting the community, updated residential wildfire event information should be posted periodically on County and District websites. Updated information is generally available on messages recorded and made available on event-established, dial-up telephone line(s) by the El Paso County Sheriff's Office. The District should consider a similar arrangement referring residents to the appropriate information outlet. The telephone numbers of phone lines are established for each event, with the numbers announced to the public via printed or announced public broadcast mediums. Periodic updates regarding emergency events are also generally broadcasted via AM radio, on the official emergency public broadcasted radio stations for El Paso County.

The Academy School District 20 will contact all parents via phone calls or other communication tools within its communication plan. These types of messages typically advise parents of emergencies, and steps they need to take regarding their children.

El Paso County OEM is currently investigating use of the Pikes Peak United Way 211 Network as a tracking tool for evacuees and their families.

IMPLEMENTATION PLAN

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

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

Public Education

The DWFPD 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*," DWFPD may experience up to 10% change to its profile of residents during the year. Many of these "*new*" residents of the district 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 DWFPD 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 district residents and the availability of qualified instructors or presenters. The public education topics 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
 - Ready. Set. Go! Program.
 - Addressing for residences and properties.
- Public Education programs will use professionally developed instruction material developed from resources recognized for their experience and expertise including,
 - National Firewise Communities USA
 - American Planning Association
 - United States Forest Service
 - Colorado State Forest Service
 - Colorado State University Cooperative Extension

- Pikes Peak Wildfire Prevention Partners
 - El Paso County Sheriff Department
 - www.ReadyColorado.com web site
 - Private Consultants
- Upon publication of the Community Wildfire Protection Plan for DWFPD, district staff will develop an annual schedule of projects that may be published and periodically recapped in DWFPD newsletters and web sites. Also, see CSU Extension Fact Sheet 6.302, **Creating Wildfire-Defensible Zones** (See **Appendix C**).

Although several public meetings have been held to inform and/or assess the opinions of the general public (through NEPCO) on *Firewise* and wildfire issues, the 2010 baseline for this implementation plan area is being considered zero. Annual performance assessment of public training will be based upon the public education training and informative session attendance as well as comments and reactions from the general public. For overall impact of the wildfire protection plan program, training session attendance should be totaled annually and expressed as a percentage of DWFPD total residents. This percentage should be trended year after year for evaluation and public education course management purposes.

Fuels Treatment

It is recommended that negotiations begin with private land owners adjacent to road rights of way areas as well as private lands in general to build fuel breaks with widths as specified by the Colorado State Forest Service in its *Fuelbreak Guidelines for Forested Subdivisions* (See Appendix E). The acreage of the proposed fuel treatment, coupled with the density/types of vegetation were used to calculate the estimated costs of mitigation associated with each proposed fuel treatment / mitigation project area. An additional factor of ten percent should be added to the estimated cost per acre to account for measurement discrepancies. All homes should, at a minimum, follow **CSU Extension Fact Sheet 6.302, Creating Wildfire-Defensible Spaces**. Special attention should be paid to removal of ladder fuels, reducing tree stand densities, and increasing live tree crown separation to reduce crown fire risks.

Three Proposed Mitigation Strategies

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

Road Rights of Ways

For properties on which the El Paso County possesses rights of way or on properties directly owned by the County (Open Space), mitigation work may be funded through grants received by the County or DWFPD. This funding will either come from State or private grant funding or through Federal grant monies applied for and received by the County. Permission of El Paso County will be required for any implementation on county properties. All City of Colorado Springs controlled rights-of-ways where identified as having low fuel volumes with minimal treatments (mowing) required.

Private Homeowner and Landowner Properties

DWFPD does not have control over private properties within its boundaries. Therefore, fuel mitigation on private properties, although highly encouraged by the DWFPD, is the responsibility of the property owner and should follow CSU Extension Fact Sheet 6.302, *Creating Wildfire-*

Defensible Spaces (See **Appendix C**). However, the district can provide information and services to assist property owners in their mitigation efforts. These information and services, such as site inspections, will consist of references, Firewise planning details and planning guides, occasional Firewise training classes, and a slash pile disposal site (Black Forest Slash Mulch Site). The recent introduction of small mastication (brush grinding) equipment to the community through classes and initial fuel treatments has created a new slash disposal method for all property owners.

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

Home Owner Association Owned Properties

Many of the homeowner associations (HOA) within the District own and manage private community open spaces and parks. These may also include drainage ways and related improvements (storm channels, detention ponds, etc.). All of these areas typically abut home sites, and can have a direct impact on wildland fire impacts to those residences. Each HOA should develop a wildfire mitigation plan for all of its properties that allows abutting property owners to mitigate fuels as recommended by the District. These fuel treatments may range from simple mowing to brush clearing and forest thinning. Many of these properties are typically encumbered by conservation easements or other legal restrictions that should be addressed in any prescriptions.

Public Lands- local, state and federal

Partnerships established during the CWPP development process should be used to begin the process of wildfire hazard reduction on lands owned by local, state and federal entities. Local governments such as El Paso County Parks and Open Space (EPCOPOS) and District 20 Schools own properties within the District that can be affected by or affect adjacent properties. EPCOPOS owns and manages the Fox Run Regional Park that abuts the District. Fuel treatments and forest management activities have been initiated on portions of this property. The school district owns three school sites within the District.

The Air Force Academy (AFA) abuts the District’s entire western boundary. Fuel management along this boundary has been initiated by AFA natural resource management staff. All efforts by the AFA staff should be supported by the District to reduce spotting potential from pockets of heavier fuels east of Stadium Drive.

The only state lands within or abutting the District are controlled by the Colorado Department of Transportation (CDOT). These are I-25 and Colorado 83. The primary fuel treatments will be annually mowing, as currently done, and thinning of dense pockets of ponderosa pines along Colorado Highway 83.

Proposed Wildfire Fuel Treatment Areas

The district is divided into four compartments for the process of locating and defining potential wildfire fuel treatment needs. This information is shown below using compartment maps (see Figure 2, Chapter 3) for the reader to reference. These are summarized on a compartment by compartment basis to designate project location, specific fuel treatment, and mitigation priority (**Appendix A**). Also shown is the location description, estimated mitigation acreage of the proposed fuel treatment and broad, estimated cost of the project.

Fuel Reduction Project Prioritization

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

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

Type of Mitigation Used for Projects

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

Scheduling

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

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

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

Priorities for Treatment

Four main areas are targeted for treatment. These are:

1. Egress/Evacuation Routes - Road right-of-ways are typically 60 feet wide throughout the community. All heavy fuels along roadways should be treated to reduce fire intensity to a level that can be survived while in a vehicle. The long range goal for all roadways is to have flames on the ground in lighter fuels versus dangerous flame lengths that may extend into the roadway.
2. Home Ignition Zones- All homes and lots should be treated to a level sufficient to prevent home ignition from both flame impingement and aerial firebrands (embers). **All homeowners should follow CSU Extension Fact Sheet 6.302, Creating Wildfire-Defensible Spaces (See Appendix C).** Note: In communities with adequately treated egress/evacuation routes, completion of defensible spaces and/or home ignition zones should be a number 1 priority. This goal will be accomplished primarily through education. Home insurability will also factor into

decisions by homeowners to mitigate their homes and properties. Replacement of shake roofs should also be a priority.

3. Staging Areas- Areas with low fuel volumes, primarily native grasses, may serve as temporary staging areas for residents and fire fighters. These should meet NWCG (National Wildfire Coordinating Group) standards for safety zones and are included in **Appendix F**.
4. Surrounding areas that will affect fire behavior from one lot to the next, or from outside the community. This may include the more remote areas of residential lots well outside the lot owners home ignition zone. Bridle path maintenance will fall within these areas

Compartments- Methods for Treatment

The community has been divided into four different zones that will also serve as compartments. These range from open grasslands to heavy timber. These are shown in Figure 22.

- a. Grasslands, native prairie: Prescription for treatment is regular mowing and regular noxious weed control. Timing of mowing is typically at time of grass curing/drying (July/August). Areas not mowed in late summer or fall should be mowed in the spring if insufficient snow was present to lay down aerial fuels. Mowing should also be timed to allow for adequate reseeding of native grasses and wildflowers. Estimated fuel treatment cost is \$100/acre (mowing at \$25/acre, weed control at \$75/acre).
- b. Open Pine with grasses: Prescription for treatment is periodic mowing and removal of ladder fuels to a height of 10 feet above ground level. Ladder fuels under mature pines should be removed to reduce tree losses. Low intensity ground fire typically burned under and around native pines with minimal tree losses. Estimated fuel treatment cost is \$500/acre (mowing at \$25/acre, weed control at \$75/acre, pruning and slash disposal at \$400/acre). Slash disposal methods may include chipping, lop-and-scatter, slash pile burning or mastication.
- c. Mature Brush: Prescription for treatment is to break up fuel continuity both horizontally and vertically. Remove dead material and prune lower branches in clumps to a three foot height above the ground. Recommended clump size and spacing is: Clumps should not be wider than two times their height. Clump separation should be at least 2.5 times their height. More information on managing Gambel oak is available in *CSU Publication 6.311, Managing Gambel Oak* (Appendix H). Estimated fuel treatment cost is \$500/acre (est. cost based on use of mastication equipment. If hand treated, est. cost can be as high as \$1,200/acre).
- d. Heavy Timber: Prescription for treatment should focus on both improving tree health while increasing tree crown separation to reduce crown fire risk. Overtopped and suppressed trees should be removed from underneath mature pines. Brush should be cleared from under pines to a distance ten feet beyond their driplines (extent of outer branches) to reduce tree branch scorching. Trees should be pruned to a height of ten feet above ground level. No more than 1/3rd of live branches should be removed at any one time. Estimated fuel treatment cost is \$1,200/acre (est. cost based on hand cutting of overtopped/suppressed trees and mastication of slash. If chipping is used for slash disposal, est. cost is \$1,800/acre.).

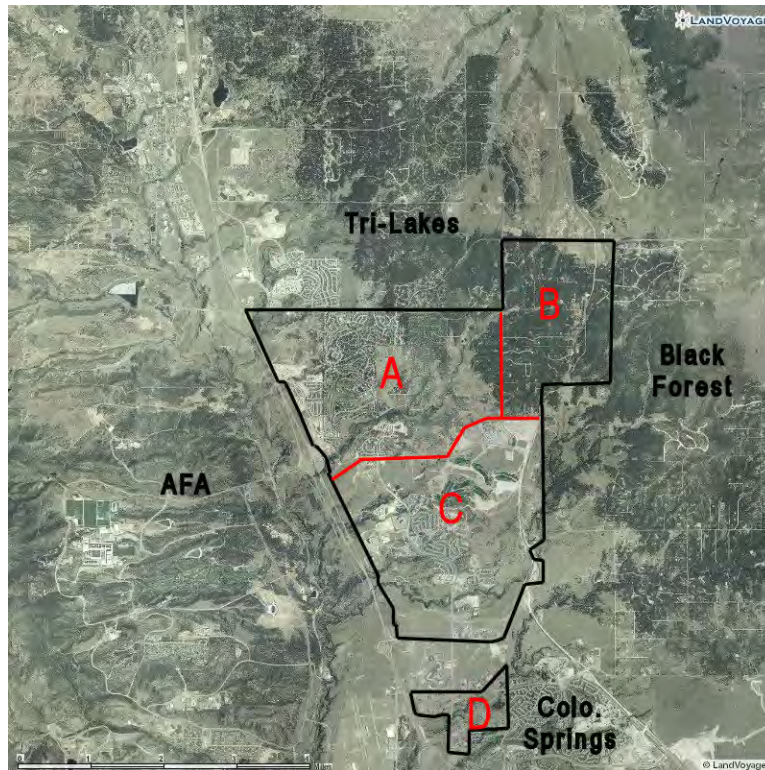


Figure 22, Fuel Compartments

Slash Disposal

A major impediment to homeowner mitigation is disposal of the biomass once a decision has been made to begin mitigation. El Paso County currently operates a “Slash-Mulch Site”, located in Black Forest. This works for homeowners that have pickups or trailers to haul to the slash site. Other programs may be necessary to allow for timely mitigation. Some of these might include:

1. Regularly scheduled slash chipping days where homeowners place the slash at curb-side for treatment by a contractor. Individual community committees can be used to administer this type of program which may be funded by the end users.
2. Regular slash pickups by disposal contractors that charge based on the volume removed.
3. Neighborhood or block projects where each homeowner chips in to rent a chipper or hire a contractor to process slash.
4. DWFPD purchase of a chipper to use on mitigation projects in and around the fire district.
5. Lop-and-scatter of slash in areas well beyond the home ignition zones of residences.
6. Slash pile burning as may be permitted by DWFPD.
7. Mastication of slash.

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

Architectural Control

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

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

Road Rights of Way and Staging Areas

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

Adequately designed Staging Areas 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.

Implementation Actions

- Mitigate existing road areas within the right of way associated with the road. Permission is required from El Paso County. Generally, in all established and planned roads within the district, this action creates a fuel gap of 60-120 feet; i.e., 30 feet either side of the centerline of the road. Although Colorado State guidelines for fuelbreaks are generally 300 feet or greater, depending on fuel density and slope, this Community Wildfire Protection Plan initially establishes a break of 60 feet since it can be addressed quickly within the road right of way, followed later by working with adjacent landowners to encourage widening the fuel gaps by encouraging "*feathering*" of the fuel treatments into their private land. The community Boards should:
 - Work with DWFPD, El Paso County Department of Transportions (EPDOT), Colorado Springs Fire Department, and CSFS to assess and cooperate on joint fuel mitigation projects;
 - Review prioritization of rights-of-way 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 (2011 and yearly beyond) to identify "*direct*" budgeted dollars for road right of way mitigation projects and mitigation projects associated with established and recognized trails and lands within high priority properties;
 - Apply for Federal grants awarded annually for fuel mitigation and wildland fire protection support. Funding may be channeled through CSU/CSFS;
 - Develop and update annually, a long-range (five to twelve year) schedule of wildfire fuel mitigation projects and post the schedule on the DWFPD website for public access.
 - Inspect all treated areas periodically to determine need for re-treatment and/or on-going maintenance.

El Paso County Properties

The DWFPD has the opportunity to partner with El Paso County property managers 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, El Paso County properties should be treated to a higher level than that on private property; especially where no defensible space can be created by individuals due to property size, ownerships or absentee landowners. On-going maintenance by outside contractors or homeowner volunteers will be important to provide risk reduction for adjacent home sites.

Implementation Actions

The El Paso County Parks and Open Space Department 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 second growth ponderosa pine and gambel oak plant communities. Visual sensitivity will be important. The El Paso County Parks and Open Space Department should:

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

DWFPD and Fox Run Regional Park managers should coordinate efforts to establish a civilian staging area at the main park entrance on Stella Road. This area can also serve as a park visitor staging area if a wildfire should be threatening the park.

Private Homeowner and Landowner Properties

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

Implementation Actions

- DWFPD will work with private property owners within the boundaries of CWPP area to support them in mitigation efforts by:
 - Provide resource and education help as indicated in the “*Public Education*” actions, above;
 - Complete at least one demonstration site in each fuel type throughout the community.
 - Continue to assist in tracking “*in kind*” private fuel mitigation work on private property;
 - Administer certain support projects; e.g., periodic *slash* removal;
 - Continue to support funding for the Black Forest slash and mulch site;
 - Formalize Design Review processes and Design Guideline modifications that allow for implementation of Defensible Spaces within covenant controlled communities. These shall utilize the services of DWFPD fire fighters, CSFS or approved professional foresters.
 - Continue to encourage replacement of wood shake-shingle roofs by allowing as many materials as possible. Alternatives that maintain the aesthetic values currently established, while providing a “Class A” level of protection are critical.
 - Provide information distribution of wildfire planning or Firewise events or activity affecting the homeowner;
 - Provide volunteer notification and limited assistance of homeowners during an emergency event.

- Lot addressing for all properties should be upgraded to improve visibility from any right-of-way abutting the property. This will allow timely response by the District and out-of-district resources during both medical and wildfire emergencies.

Undeveloped, Privately-owned Properties

With a high percentage of lots developed, areas of undeveloped land lie intermixed throughout the District. These areas are heavily covered with dense, untreated brush, heavy tree cover and, in many situations, also present rough, sloping terrain. Consequently, these areas present huge fuel beds for wildfires and present DWFPD with its most significant threats for wildfires. The undeveloped, and generally privately-owned, areas may require DWFPD to take more aggressive action on abutting properties in order to address fuel reduction.

Implementation Actions

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

Homeowner Association Owned or Controlled Properties

Home owner associations can aid their residents by developing policies, within their covenant structures, that allow potentially affected owners to reduce wildfire risks that may originate on common areas

Implementation Actions

- Develop procedures for all owners to treat abutting common areas to reduce both flame and firebrand (ember) exposures to private improvements such as fences and landscaping.
 - Involve any architectural control committees or board members in establishing policies in conformance with SB-100, Section E that allow homeowners to mitigate their properties.
 - Develop fuel and vegetation management plans for each common area parcel in cooperation with the District.
 - If the HOA is unable to maintain its properties that abut residences, then it should develop a standard template for homeowners for allowed maintenance and landscape installations on common areas for reducing wildfire exposures to fences and landscaping.
 - Develop a budget line item within the HOA annual budget for timely treatment of fuels.
 - Insure inclusion of wildfire mitigation language in any open space management plans or easements.
 - Encourage or require all properties to be labeled with addressing that meets District recommendations.

Local, State and Federally Controlled Properties

Local government owned properties should be treated to reduce wildfire exposures to abutting private ownerships. County parks and school district properties should be inspected annually to identify any exposures to roadways and private properties.

State properties (highway rights-of-ways) should be mowed annually to reduce grass heights to a minimum of six (6) inches in height. The District should obtain permission from CDOT to thin dense stands of young trees along Hwy. 83.

The Air Force Academy has started fuel treatments, along with risks assessments of areas east of its Stadium Boulevard. No actions are required or recommended at this time.

Implementation Actions

- Partner with El Paso County in the design and implementation of fuel treatments in Fox Run Regional Park.
 - Prioritize areas of the park that abut private properties. Installation of shaded fuel breaks are recommended on all sides of the park. Forest management thinning should be done on all other forested areas.
 - Designation of main park thoroughfares as “Fire Lane- No Parking” areas that allow either county or District personnel to authorize towing of improperly parked or impeding vehicles. Proper posting that allows timely towing should be put in place, and may include pre-contracting with a towing company.
 - Install signage or add to existing signage language that warns park visitors of procedures for evacuation during a wildfire event.
 - Treat fuels at the main entrance, off Stella Road, to allow use of the area as a potential staging area for park visitors and evacuees from surrounding properties. Treatment level of this park area should be to a level that allows use of prescribed fire during a wildfire event.
 - Treat areas around the County Maintenance yard and all other county owned structures in the park.
- Partner with School District 20 to:
 - Treat fuels around The Classical Academy to a distance of 200-300 feet from all structures and parking areas. Consider a joint project with the District to accomplish this.
 - Develop fuel treatment prescriptions acceptable to US Fish and Wildlife Service for annually and maintenance treatments of Preble’s Meadow Jumping Mouse habitat abutting The Classical Academy.
 - Partner with the District to utilize the small natural stand of Gambel oak by the Da Vinci Academy for wildfire education and potential school or Boy Scout project.

Maintenance of Fuel Treatment Areas

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

Implementation Actions- Private Owners

- To maintain mitigated areas, private property owners and the district should:

- Assess mitigated property periodically and determine the relationship of the property's vegetation growth against the maintenance guideline for the mitigated property;
- Grasses should be kept mowed to a maximum height of 6 inches during the wildfire season.
- Ladder fuels need to be removed from residual trees and kept pruned up 7-10 feet above ground level.
- Dead materials should be removed from brush and forest areas on an annual basis.
- All areas of the District should be monitored for forest insect and disease outbreaks that may increase fuel loading.

Implementation Actions- DWFPD and other government entities

- The DWFPD Board should consider implementing the following administrative actions:
 - Establish a separate DWFPD budget category, which denotes funds for CWPP planned actions
 - Apply for Federal grants applicable to mitigation and Firewise work as these may become available;
 - Budget specific DWFPD funds for "*direct*" funded wildfire fuel mitigation on road/trail rights of ways and high priority privately owned property. It is recommended the District fund at least five acres of fuel treatment annually, in priority one areas, as part of its wildland fire training and practice program already in place;
 - Begin discussion with private property owners adjacent to high risk neighborhoods for potential individual and joint wildfire mitigation efforts on common interest areas;
 - Sponsor regular wildfire prevention trainings/classes for residents in conjunction with CSFS, El Paso County and El Paso County Sheriff's Office;
 - Assess timing of and maintain a schedule of land development action in currently undeveloped areas; Continue present efforts to amend wildland fire codes for all new construction in the District.
 - Annually review the current District Evacuation Plan in cooperation with El Paso County Sheriff's Office and Colorado Springs Police Department.
 - Develop a homeowner education program for evacuation and multi-hazard awareness that may utilize existing or District developed materials. An example is the READY, SET, GO! Program adopted by the Colorado State Fire Chiefs Association.
 - Schedule periodic general public updates of CWPP planned work; This may include an annual inspection of each subdivision or neighborhood, with a report of conditions found to the appropriate HOA. In areas with no HOA, individual contacts may be required.
 - Establish and maintain baseline information for proposed areas of mitigation. Develop a series of baseline digital photographs for all areas;
 - Evaluate planned CWPP projects for effectiveness and amend CWPP annually to keep plan and actions current and appropriate for changing environmental and development conditions.
 - Meetings with partners should be held annually to determine additional needs and/or updates to the plan. The District should meet annually with NEPCO.
 - Develop at least one Protect-in-place community within the District. Struthers Ranch is recommended as the first test community. This may require a multi-year project to:
 - Initiate educational efforts (year 1),
 - Begin treatments of heavy fuels (years 2-3).
 - Annual inspection to insure conformance with guidelines.
 - Implement at least one demonstration plot within each fuel type or community within the district. These should be completed within three years of CWPP adoption.
 - Continue on-going efforts to provide an economical and convenient slash disposal site, method(s), or disposal service for District residents. Acquisition of a District chipper should be investigated.
 - Develop a standard template for address markers and property identification within the District. Any system developed should use letters, numbers and symbols a minimum in height of four (4) inches, with a ½ inch stroke (NFPA 1144, Section 5.6.1.2) and should be

visible from the road surface in both directions of travel. Address markers should also be of reflective materials.

Post-Fire Remediation

In the event a large wildland fire should burn significant acres in the community, the District will need to partner with other local governments to support efforts to 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 road networks. The de-nuding of slopes may release sediments and ash into existing drainage ways 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 district's primary function will be to secure any unsafe condition that may develop after a wildfire event. It can partner with local governments to facilitate:

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. This could be coordinated through El Paso DOT and Colorado DOT.
3. Hire a reclamation contractor to stabilize areas above homes and critical infrastructure with a combination of temporary and permanent erosion control measures. This can be coordinated through El Paso County, Natural Resource Conservation Service (NRCS) and local soil conservation district.

Post-fire issues can linger on for many years after fire occurrence. The district 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. Mountain Pine Beetle is active in the area, although the activity seems to be confined to individual trees or small pockets of trees at this writing. Palmer Lake and portions of the Black Forest are currently experiencing the highest outbreak of MPB (see Figure 23). The threat of increased activity is always present. Vigilance will be necessary on the part of district residents 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. 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. Mountain pine beetle information is available at www.csfs.colostate.edu.



Figure 23, Mountain Pine Beetle infestation, Palmer Lake, 2008

Severe infections of Dwarf Mistletoe (DMT) have been found throughout the community. Mistletoe is a parasitic plant that infects pines, and results in the slow death of the trees. Trees infected with the parasite can result in increased fire hazards. There are several strategies to control mistletoe infections, and advice from a professional forester should be sought if a landowner has mistletoe infected trees. DMT information is available at www.csfs.colostate.edu.

Builders who remove trees for lot clearing and subsequent home construction should remove all lot clearing slash within six weeks of cutting 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. Ips activity is currently heavy in the Palmer Divide area due to dry summer weather. Regular preventive spray applications to high value, stressed trees should be done until the stressing agent is eliminated. The most effective prevention for harmful insects is always a good program of forest management and thinning. Properly thinned trees will be less susceptible to insects, and thinned stands are more likely to survive a wildfire without serious damage.

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

Weed Control

Virtually all areas of the district are infested with noxious weeds that are displacing native plants and degrading wildlife habitat. Noxious weeds can also contribute to wildfire spread. District residents should begin an 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 may 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.

Specific forest management recommendations and other natural resource concerns are beyond the scope of this document. Residents are encouraged to contact a professional forester or resource professional specific to their situation.

Conclusion

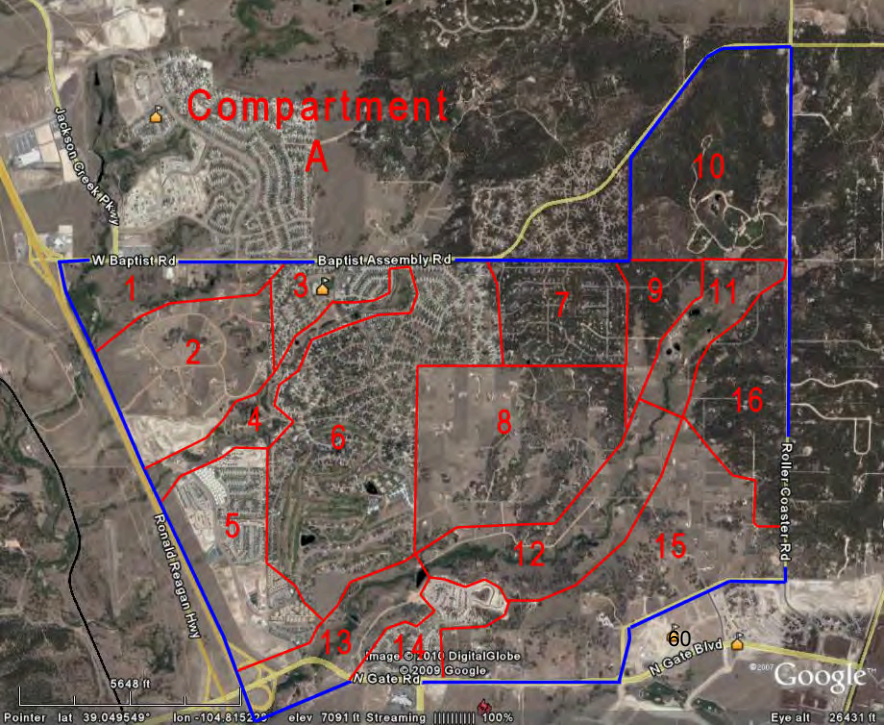
This plan is intended to be a guide for the District as it continues its mission to protect life, property and natural resources within the District. Education of current and future residents will be critical to success of this plan.

Appendix A
Hazard Reduction
And
Mitigation Chart

Compartment Notes:

1. Treatment Area Numbering- Each of the four compartments is divided into sub-compartments with the first character as a letter and second character as the sub-compartment. The third character is level of priority for treatment, ranging from 1 (highest) to 4 (lowest). Unit # A-1-1 is in Compartment A, sub-compartment 1, with priority level 1. Priorities are based on:
 - a. Priority 1- Transportation routes for homeowner evacuation (egress) and emergency services ingress. Home sites in heavy fuels.
 - b. Priority 2- Homes backing to or inter-mixed with heavy fuels.
 - c. Priority 3- Homes backing to lighter fuels or smaller pockets of fuels.
 - d. Priority 4- Residential lots- Considered Homeowner responsibility for Defensible Space and Home Ignition Zone.
2. Fuel Type is based on four simple types. These are: 1) Low for developed areas; 2) Moderate for light fuels such as grass or developed areas; 3) High for gambel oak and scattered pine mixed with grass areas; 4) Severe for heavy timber prone to crown fires. Combinations of the above are used to show fuel mix. Suburban residential areas are treated as moderate due to formal landscaping, irrigation, and normally higher level of maintenance. National Fire Danger Rating System (NFDRS) fuel model equivalents are listed in Chapter 4 under Vegetation Analysis. No areas are listed as low, meaning non-flammable areas.
3. Treatment Cost per acre is based on equivalent projects in similar fuel types within El Paso County.
4. Treatment types are either by hand or mechanical. Hand treatments are typically done by individuals cutting one stem at a time. Mechanical treatments are done by machine on a multi-stem basis. Estimated cost for homeowner treatments is for chipping of material by a hired contractor. Mowing is to a maximum height of six inches. A maximum height of four inches is recommended around structures.
5. The eastern boundary of the DWFPD abuts the Black Forest Fire Protection District and should be considered for joint projects.
6. Colorado Springs Fire Department is currently developing a CWPP for all areas within the City.
7. All neighborhoods within the DWFPD are encouraged to develop a more detailed CWPP for which this plan may serve as their base document.

Compartment A



Compartment A

SUB-COMP.	PRIORITY	ACRES	FUEL TYPES	DESCRIPTIONS
A-1	4	158	Moderate	Primarily wetland (willows, shrubs, grasslands) and potential Prebles Meadow Jumping Mouse habitat. Clumps of Gambel oak found in clumps in upland areas. Fuel continuity provided by grasses. Exposures are busy roadways (I-25, Baptist Rd, Struthers Road) and adjacent residential and commercial uses. Small isolated clumps of ponderosa mixed with oak understory on east side of sub-compartment backing up to residential area. Slopes range from 5-15% with aspect to the west. Prescription is to mow grasses seasonally in areas abutting developed areas. Residential lots should treat Gambel oak to CSFS specifications per Publication 6.311.
A-2	3	302	Moderate	Primarily prairie grasses with scattered clumps of Gambel oak, generally not continuous. Sub-compartment is mostly Struthers Ranch with low density housing. All treatments will be on private property through extension of defensible spaces and home ignition zones around all structures. Consider establishing the first "Protect in Place" community in this neighborhood. No Preble's habitat present. Slopes range from 5-15% with aspect to the southwest. Prescription is to mow grasses seasonally around structures and treat oak to CSU Publication 6.311 specifications.
A-3	3	96	Moderate	Residential areas with suburban densities. Small pockets, usually less than .1 acre in size, intermixed on lots. Heavy oak clumps and mountain mahogany to west of sub-compartment on private property in A-2. Mature and maturing landscaping will provide fuel continuity in the future (5+ years). High number of shake roofs present potentially leading to structure-to-structure ignitions and firebrand ignitions. Prescription is to treat Gambel oak clumps to CSU Publication 6.311 specifications, and create defensible spaces around structures. Home ignition zones, abutting A-2 should be extended to the property line. Encourage replacement of shake roofs to Class A materials.
A-4	2	138	Moderate to High	Storm drainage way, with drainage structures, through residential areas consisting of un-mown grasses, upland oak, cattails, willows and cottonwoods. Fuel continuity to structures is continuous to all homes abutting the open space. Fire behavior may be exacerbated by high winds flowing up (channeled) the drainage way. Prescriptions include: 1) seasonal mowing of grasses during times of high to extreme fire danger adjacent to all homes; 2) extend defensible spaces to property lines; 3) extend home ignition zones into the open space by treatment of oak clumps and thinning of willows; 4) isolate privacy and property line fencing that lead directly to structures. If homeowners association (HOA) is unable to complete treatments on the open space, then individual homeowners should be allowed to extend their home ignition zones into the open space by prescriptions prepared by a forester or the fire department, with approval by the HOA not unreasonably withheld (following

Compartment A

				procedures outlined in SB-100). Slopes range from 5-15% with aspect generally to the WSW. Emergency egress from the area is potentially confusing due to winding, curving streets with no clear direction to exit points (Gleneagle Drive).
A-5	4	279	Low to Moderate	Commercial and high density residential areas generally constructed in “over-lotted” conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds leading to structures and fences. All roofs are Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Slopes are 5-10% with aspect to the southwest.
A-6	3	664	Moderate to High	This area is generally described as “Gleneagle” with primarily suburban densities. A golf course is located along the southern half of the community. Homes are intermixed with pockets of Gambel oak on lots and greenbelts. A high number of homes have shake roofs. Landscaping is maturing and potentially creating fuel continuity. Prescriptions include: 1) seasonal mowing of grasses during times of high to extreme fire danger adjacent to all homes; 2) extend defensible spaces to property lines; 3) extend home ignition zones into the open space by treatment of oak clumps and thinning of willows; and 4) isolate privacy and property line fencing that lead directly to structures. If homeowners association (HOA) is unable to complete treatments on the open space, then individual homeowners should be allowed to extend their home ignition zones into the open space by prescriptions prepared by a forester or the fire department, with approval by the HOA not unreasonably withheld (following procedures outlined in SB-100). Slopes range from 5-25% with rolling topography to the WSW.
A-7	1	199	High to Severe	This areas is generally described as “Pleasant View” with lots usually less than 1 acre in size. Mature/aging housing (>20 years) present. Homes are situated in heavy, dense second growth ponderosa pine forest with Gambel oak present in the understory. Overhead power lines are located in easements located at the back of lots. Unthinned, unmanaged forest conditions can lead to uncontrollable crown fires. Risk of structure fires starting a forest fire are high, along with other human caused ignition sources (barbeques, catalytic converters, unsupervised youth, etc.). Narrow, winding roads may lead to confusion during a wildfire event. Subdivision exits are unclearly marked and generally lined with heavy pockets of fuels. High slash disposal costs will be a hindrance to homeowner action. Prescriptions include: 1) Create defensible space around all homes following CSU Publication 6.302; 2) Remove all vegetation from public rights-of ways, and mow grasses annually with prioritization of exit routes; 3) Work with Mountain View Electric to improve line clearances from adjacent trees, along with updating old facilities/infrastructure that may be prone to failure during high winds; 4) Assist Academy Water District with upgrading of water

Compartment A

				supplies and infrastructure; and 5) Install signage directing residents to exits. Slopes range from 10-35% with aspect generally to the southwest.
A-8	3	468	Moderate to High	Primarily Sun Hills with low density housing on 2.5-10 acre lots. West side is primarily prairie leading to heavy Gambel oak and ponderosa pines to the east. Roads are generally wide, though unpaved. Homes will be best protected by completion of defensible spaces and improved home ignition zones around all structures. Prescriptions include: 1) Mow meadow areas and barrow ditches seasonally as wildfire danger increases; 2) Treat Gambel oak areas following CSU Publication 6.311; 3) Install defensible spaces per CSU Publication 6.302; 4) Thin ponderosa pine stands to improve health and reduce crown fire potential; and 5) install directional signage to exits from the area. Slopes range from 5-25% with aspect to the southwest.
A-9	1	96	High to Severe	Low density housing similar to A-8. Area abuts Fox Run Regional Park. Crown fire potential is high due to dense stands of second growth ponderosa pines. Treat areas abutting Fox Run Regional Park as an extension of the proposed Fox Run Safety Zone. Prescriptions same as A-8. Slopes range from 10-20% with aspect to the south.
A-10	1	428	High to Severe	Fox Run Regional Park. Area to be considered for upgrade to a safety zone for homeowners escaping heavy fuels from the west. Signage recommended. Project would be a cooperative effort with El Paso County Parks. This area abuts residential housing on three sides. Portions of the Park have been thinned to improve forest health. Public support and funding necessary to continue El Paso County's efforts to reduce wildfire risks to adjacent homes. Installation of "shaded fuel breaks" should be done along all boundaries. The main developed park entrance off Stella Drive should be considered as a potential safety zone for residents to the west. Slopes range from 5-35% with aspect generally to the south and southwest.
A-11	2	127	Moderate to High	This is a wide drainage way with large lots (>2.5 acres). Treat areas abutting Fox Run Park as an extension of proposed Fox Run Safety Zone. Fuels are primarily grasses with pockets of willows, cottonwoods, Gambel oak and ponderosa pine. Wildfire behavior will be affected by wind driven events from the west, with winds funneled up the drainage way. Prescriptions include: 1) Mow meadow areas and barrow ditches seasonally as wildfire danger increases; 2) Treat Gambel oak areas following CSU Publication 6.311; 3) Install defensible spaces per CSU Publication 6.302; 4) Thin ponderosa pine stands to improve health and reduce crown fire potential; and 5) install directional signage to exits from the area. Slopes range from 5-15% with aspect to the southwest.
A-12	3	273	Moderate to High	Same as A-11.
A-13	4	179	Moderate to	Same as A-11

Compartment A

			High	
A-14	4	109	Low to Moderate	High density suburban residential housing surrounded by natural areas with Gambel oak and un-mown prairies. Homes abutting natural areas should follow recommendations outlined in CSU Publication 6.302. Gambel oak areas within common areas and open spaces should be treated following CSU Publication 6.311.
A-15	3	514	Moderate to High	Low density residential area with Gambel oak and scattered ponderosa pines. Roads are generally wide, though unpaved. Homes will be best protected by completion of defensible spaces and improved home ignition zones around all structures. Prescriptions include: 1) Mow meadow areas and barrow ditches seasonally as wildfire danger increases; 2) Treat Gambel oak areas following CSU Publication 6.311; 3) Install defensible spaces per CSU Publication 6.302; 4) Thin ponderosa pine stands to improve health and reduce crown fire potential; and 5) install directional signage to exits from the area. Slopes range from 5-25% with aspect generally to the west.
A-16	2	238	High to Severe	Low density housing similar to A-8. Crown fire potential is high due to dense stands of second growth ponderosa pines. Prescriptions same as A-8. Slopes range from 10-35% with aspect to the southwest.

Compartment B



Image © 2010 DigitalGlobe
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65
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Robinson Reservoir

5009 ft
Gate Rd

Pointer lat 39.053394° lon -104.774068° elev 7455 ft Streaming 100%

Eye all 24228 ft

Compartment B

SUB-COMP.	PRIORITY	ACRES	FUEL TYPES	DESCRIPTIONS
B-1	2	747	High to Severe	Primarily low density housing on 2.5-10 acre lots. Heavy Gambel oak and ponderosa pines with small meadow openings. Roads and long driveways are narrow and unpaved. Homes will be best protected by completion of defensible spaces and improved home ignition zones around all structures. Prescriptions include: 1) Mow meadow areas and barrow ditches seasonally as wildfire danger increases; 2) Treat Gambel oak areas following CSU Publication 6.311; 3) Install defensible spaces per CSU Publication 6.302; 4) Thin ponderosa pine stands to improve health and reduce crown fire potential; 5) Install "shaded fuel breaks" where possible, with emphasis along roadways and long driveways; and 6) install directional signage to exits from the area. Slopes range from 5-35% with aspect to the southwest. Priority is area abutting Fox Run Park and all roadways.
B-2	2	101	Moderate	Low density housing in prairie fuels. Prescriptions include: 1) Mow meadow areas and barrow ditches seasonally as wildfire danger increases; 2) Treat Gambel oak areas following CSU Publication 6.311; 3) Install defensible spaces per CSU Publication 6.302; 4) Thin ponderosa pine stands to improve health and reduce crown fire potential; and 5) install directional signage to exits from the area. Slopes range from 5-25% with aspect to the southwest. Priority is area abutting Fox Run Park and all roadways.
B-3	2	168	High to Severe	Low density residential area with open meadows and ponderosa pine stands. Portions of forests have been thinned to remove understory trees. However, pine stands not thinned to reduce crown fire potential. Roadways generally wide and well maintained as a gated, high-end residential community. Prescriptions include: 1) Mow meadow areas and barrow ditches seasonally as wildfire danger increases; 2) Treat Gambel oak areas following CSU Publication 6.311; 3) Install defensible spaces per CSU Publication 6.302; 4) Thin ponderosa pine stands to improve health and reduce crown fire potential; 5) Install "shaded fuel breaks" where possible, with emphasis along roadways and long driveways; and 6) install directional signage to exits from the area. Slopes range from 5-25% with aspect to the southwest. Priority is area abutting Fox Run Park and all Roadways.
B-4	2	939	High to Severe	Primarily low density housing on 2.5-10 acre lots. Heavy Gambel oak and ponderosa pines with small meadow openings. Roads and long driveways are narrow and unpaved. Homes will be best protected by completion of defensible spaces and improved home ignition zones around all structures. Prescriptions include: 1) Mow meadow areas and barrow ditches seasonally as wildfire danger increases; 2) Treat Gambel oak areas following CSU Publication 6.311; 3) Install defensible spaces per CSU Publication 6.302; 4) Thin ponderosa pine stands to improve health and reduce crown fire potential; 5) Install "shaded fuel breaks" where possible, with emphasis along roadways and long driveways; and 6)

Compartment B

				install directional signage to exits from the area. Slopes range from 5-25% with aspect to the southwest. Slopes range from 5-25% with aspect to the southwest. Priorities are areas along roadways.
B-5	4	359	High to Severe	This area is primarily Shamrock Ranch. A significant portion of the ranch has been thinned to improve forest health and reduce wildfire risks. Work is on-going. Slopes range from 5-25% with aspect to the south.

Compartment C

SUB-COMP.	PRIORITY	ACRES	FUEL TYPES	DESCRIPTIONS
C-1	4	313	Moderate	Existing and future commercial and high density residential areas generally constructed in "over-lotted" conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds leading to structures and fences. All roofs are Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Slopes are 5-10% with aspect to the southwest.
C-2	4	150	Moderate	Existing and future commercial and high density residential areas generally constructed in "over-lotted" conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds leading to structures and fences. All roofs are Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Slopes are 5-10% with aspect to the southwest.
C-3	1	171	Moderate to High	Primarily wetland (willows, shrubs, grasslands) and potential Prebles Meadow Jumping Mouse habitat. Clumps of Gambel oak found in clumps in upland areas. Fuel continuity provided by grasses. Exposures are busy roadways (I-25, Voyager Parkway) and adjacent residential and commercial uses. Small isolated clumps of ponderosa mixed with oak understory on east side of sub-compartment backing up to The Classical Academy School Campus area. Slopes range from 5-20% with aspect to the west. Prescription is to mow grasses seasonally in areas abutting developed areas. School and business areas should treat abutting Gambel oak to CSFS specifications per Publication 6.311. Prioritize for fuel treatment project in conjunction with The Classical Academy.
C-4	2	126	Moderate to High	Primarily wetland (willows, shrubs, grasslands) and potential Prebles Meadow Jumping Mouse habitat. Clumps of Gambel oak found in clumps in upland areas. Fuel continuity provided by grasses. Exposures are busy roadways (Voyager Parkway) and adjacent residential and commercial uses. Small isolated clumps of ponderosa mixed with oak understory on southeast side of sub-compartment backing up to residential area. Slopes range from 5-20% with aspect to the west. Prescription is to mow grasses seasonally in areas abutting developed areas. Residential lots adjacent to this area should treat Gambel oak to CSFS specifications per Publication 6.311.
C-5	2	62	High	Residential areas with suburban densities. Small pockets, usually less than .1 acre in size, intermixed on lots and common areas. Heavy oak clumps and mountain mahogany to north of sub-compartment on private property in C-4. Mature and maturing landscaping will provide fuel continuity in the future (5+ years). Prescription is to treat Gambel oak clumps to CSU Publication 6.311 specifications, and create defensible spaces around structures.

Compartment C

				Home ignition zones, abutting C-4 should be extended to the property line.
C-6	2	1105	Moderate	Commercial and high density residential areas (Flying Horse development) generally constructed in “over-lotted” conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds leading to structures and fences. All roofs are Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Isolated clumps of oak retained in the large lot/high end home areas should be treated following CSU Publication 6.311. Slopes are 5-10% with aspect to the southwest. Discovery Campus to be considered for Staging Area and possible evacuation center.
C-7	4	181	Moderate to High	Primarily prairie grasses with scattered clumps of Gambel oak, generally not continuous. Sub-compartment is mostly low density housing. All treatments will be on private property through extension of defensible spaces and home ignition zones around all structures. No Preble’s habitat present. Slopes range from 5-15% with aspect to the southwest. Prescription is to mow grasses seasonally around structures and treat oak to CSU Publication 6.311 specifications.
C-8	4	382	Moderate to High	Future residential areas with suburban densities. Small pockets of Gambel oak, usually less than .1 acre in size, intermixed with mountain mahogany and native grasses. Mature and maturing landscaping will provide fuel continuity in the future (15+ years). Prescription is to treat Gambel oak clumps to CSU Publication 6.311 specifications, and create defensible spaces around future structures. Home ignition zones of future homes should be extended to the property line.
C-9	4	308	Moderate	Commercial and high density residential areas generally constructed in “over-lotted” conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds leading to structures and fences. All roofs are Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Slopes are 5-20% with aspect to the southwest.
C-10	4	273	Moderate	Commercial and high density residential areas generally constructed in “over-lotted” conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds, and native prairie areas leading to structures and fences. Small pockets of Gambel oak are present, but well away from existing commercial structures. Residential areas adjacent to C-11 should follow CSU Publication 6.302 for implementation of defensible spaces. All roofs are Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Slopes are 5-15% with aspect to the southwest.
C-11	4	403	Moderate to	Primarily wetland (willows, shrubs, grasslands) and potential Prebles Meadow Jumping

Compartment C

			High	Mouse habitat. Clumps of Gambel oak found in upland areas. Fuel continuity provided by grasses. Exposures are busy roadways (I-25, Voyager Parkway) and adjacent residential and commercial uses. Small isolated clumps of oak on north side of sub-compartment backing up to residential area. Slopes range from 5-15% with aspect to the west. Prescription is to mow grasses seasonally in areas abutting developed areas. Residential lots should treat Gambel oak to CSFS specifications per Publication 6.311, and also follow defensible space recommendations per CSU Publication 6.302.
C-12	3	80	Moderate	Commercial and high density residential areas generally constructed in “over-lotted” conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds leading to structures and fences. All roofs are Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Slopes are 5-10% with aspect to the southwest.
C-13	3	159	Moderate	Commercial and high density residential areas generally constructed in “over-lotted” conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds leading to structures and fences. All roofs are Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Slopes are 5-10% with aspect to the west. Homes abutting areas with heavy native vegetation should follow defensible space guidelines per CSU Publication 6.302.
C-14	4	238	Moderate to High	Primarily wetland (willows, shrubs, grasslands) and potential Prebles Meadow Jumping Mouse habitat. Clumps of Gambel oak found in clumps in upland areas. Fuel continuity provided by grasses. Exposures are busy roadways (Voyager Parkway, Hwy 83) and adjacent residential and commercial uses. Slopes range from 5-15% with aspect to the west. Prescription is to mow grasses seasonally in areas abutting developed areas. Residential lots should treat Gambel oak to CSFS specifications per Publication 6.311 and defensible space recommendations per CSU Publication 6.302.
C-15	4	326	Moderate	Commercial and high density residential areas generally constructed in “over-lotted” conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds leading to structures and fences. All roofs are Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Slopes are 5-10% with aspect to the south.
C-16	4	292	Moderate	Commercial and high density residential areas generally constructed in “over-lotted” conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds leading to structures and fences. All roofs are

Compartment C

				Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Slopes are 5-10% with aspect to the southwest.

Compartiment D



Compartment D

SUB-COMP.	PRIORITY	ACRES	FUEL TYPES	DESCRIPTIONS
D-1	3	108	Moderate to High	Primarily prairie grasses with scattered clumps of Gambel oak, generally not continuous. Sub-compartment is south of Old Ranch Road with low density housing. All treatments will be on private property through extension of defensible spaces and home ignition zones around all structures. No Preble's habitat present. Slopes range from 5-15% with aspect to the southwest. Prescription is to mow grasses seasonally around structures and treat oak to CSU Publication 6.311 specifications. All homes should follow defensible space guidelines per CSU Publication 6.302.
D-2	4	22	Moderate	Commercial and high density residential areas generally constructed in "over-lotted" conditions with very little native vegetation present. Wildfire potential is generally low, with primary exposure from un-mown weeds leading to structures and fences. All roofs are Class B or higher. Landscaping should be monitored as it matures over the next 10-20 years with future exposures from firebrands possible. Slopes are 5-8% with aspect to the southwest.
D-3	3	167	Moderate to High	Primarily wetland (willows, shrubs, grasslands) and potential Prebles Meadow Jumping Mouse habitat. Clumps of Gambel oak found in upland areas adjacent to structures. Fuel continuity provided by grasses. Exposures are busy roadways (I-25, Voyager Parkway) and adjacent residential and commercial uses. Small isolated clumps of ponderosa mixed with oak understory on east side of sub-compartment in residential area. Slopes range from 5-12% with aspect to the southwest. Prescription is to mow grasses seasonally in areas abutting developed areas. Residential lots should treat Gambel oak to CSFS specifications per Publication 6.311, and defensible space guidelines per CSU Publication 6.302.
D-4	3	167	Moderate to High	Primarily prairie grasses with scattered clumps of Gambel oak and ponderosa pines, generally not continuous. Sub-compartment is low density, mature housing. All treatments will be on private property through extension of defensible spaces and home ignition zones around all structures. No Preble's habitat present. Slopes range from 5-15% with aspect to the southwest. Prescription is to mow grasses seasonally around structures and treat oak to CSU Publication 6.311 specifications. Defensible space guidelines per CSU Publication 6.302 should be followed by all residents.

Appendix B

Senate Bill 100

Permission for Wildfire Mitigation

In Homeowner Associations

SB-100 language

C.R.S 38-33.3-106.5 (a.k.a. SB-100) states: “ *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

CSU Extension Fact Sheet 6.302

Creating Wildfire Defensible Zones



FORESTRY

Creating Wildfire-Defensible Zones no. 6.302

by F.C. Dennis ¹

Quick Facts...

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

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

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

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

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Reviewed 1/06.
www.ext.colostate.edu

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

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

Defensible Space

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

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

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

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

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

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

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

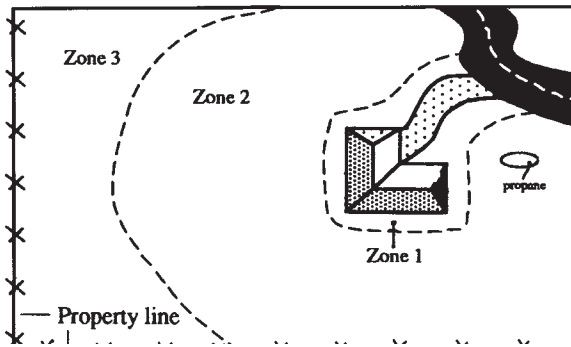


Figure 1: Forested property showing the three fire-defensible zones around a home or other structure.

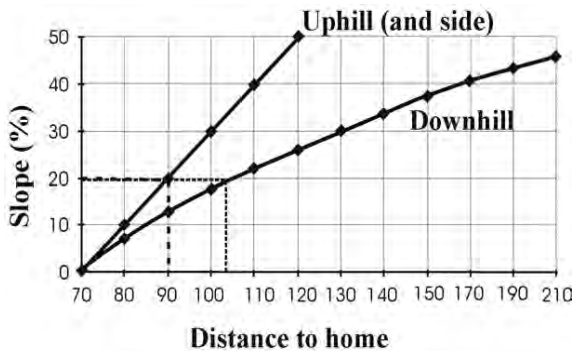


Figure 2: This chart indicates the *minimum recommended* dimensions for defensible space from the home to the outer edge of Zone 2. For example, if your home is situated on a 20 percent slope, the minimum defensible space dimensions would be 90 feet uphill and to the sides of the home and 104 feet downhill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

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

Defensible Space Management Zones

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

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

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

Prescriptions

Zone 1

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

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

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

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

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

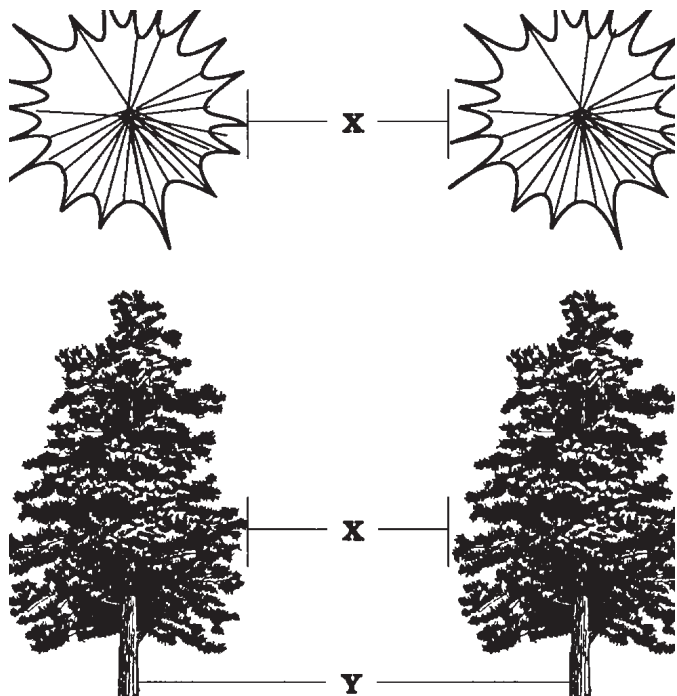
Ideally, remove all trees from Zone 1 to reduce fire hazards. If you do keep a tree, consider it part of the structure and extend the distance of the entire defensible space accordingly. Isolate the tree from any other surrounding trees. Prune it to at least 10 feet above the ground. Remove any branches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

Zone 2

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

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

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



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

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

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

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

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

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

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

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

Figure 4: Minimum tree crown and shrub clump spacing.

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

Figure 5: Minimum tree spacing for Zone 3.

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

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

Zone 3

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

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

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

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

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

Mowing is not necessary in Zone 3.

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

Special Recommendations

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

Brush and shrubs

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

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

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

Grasses

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

Windthrow

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

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

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

Maintaining Your Defensible Space

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

Defensible Space and FireWise Annual Checklist

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

Figure 6: Minimum defensible space size for grass fuels.

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

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



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

References

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

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

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

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

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

¹Wildfire Hazard Mitigation Coordinator,
Colorado State Forest Service.

Colorado State University, U.S. Department of Agriculture, and Colorado counties cooperating. CSU Extension programs are available to all without discrimination. No endorsement of products mentioned is intended nor is criticism implied of products not mentioned.

Appendix D
Project Evaluation
And
Monitoring Sheet (Sample)

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

Evaluator: _____

Date: _____

Treatment Area: _____

Description/Location: _____

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:

Appendix E
Fuelbreak Guidelines
For
Subdivisions and Communities
(CSFS, undated)



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.

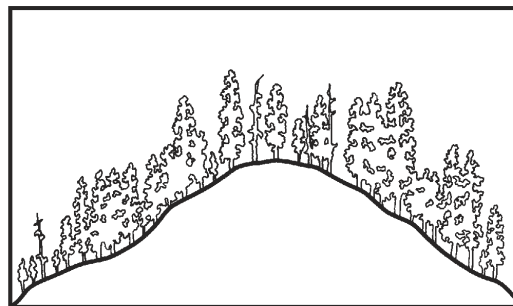
But with development inevitably comes a higher risk of wildfire as well as an ever-increasing potential for loss of life and property. Methods of fire suppression, pre-suppression needs, and homeowner and fire crew safety must all be considered in the planning and review of new developments as well as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

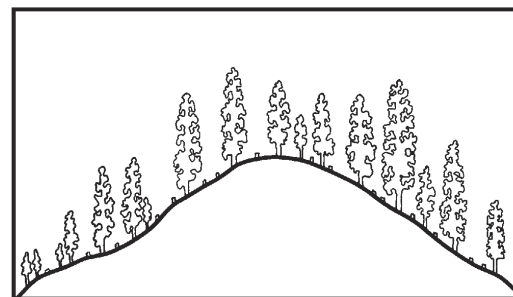
Fuelbreak vs Firebreak

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

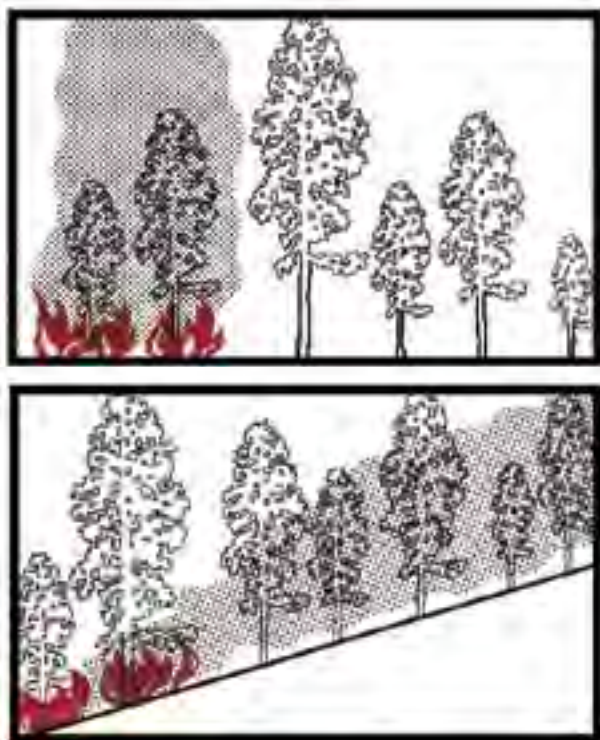
Legend: 5 – Problem may be crucial; 4 – Problem very likely; 3 – Exercise caution; 2 – Problem usually limited; 1 – No rating possible

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.

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



Saddle.

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



Flashover in V-shaped valley.

Crowning Potential

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

Crowning Potential Key

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

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

Ignition Sources

Possible ignition sources, which may threaten planned or existing developments, must be investigated thoroughly. Included are other developments and homes, major roads, recreation sites, railroads, and other possible sources. These might be distant from the proposed development,

yet still able to channel fire into the area due to slope, continuous fuels, or other topographic features.

Fuelbreak Locations

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

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

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

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

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

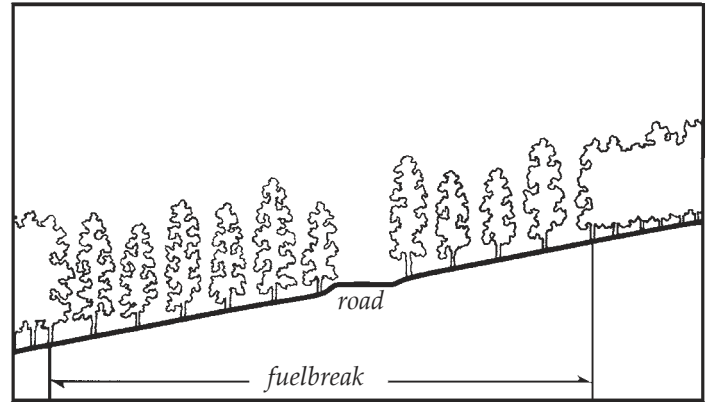
Improperly planned fuelbreaks can adversely impact an area's aesthetic qualities. Careful construction is necessary when combining mid-slope fuelbreaks with roads involving excessive cut-and-fill.



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.

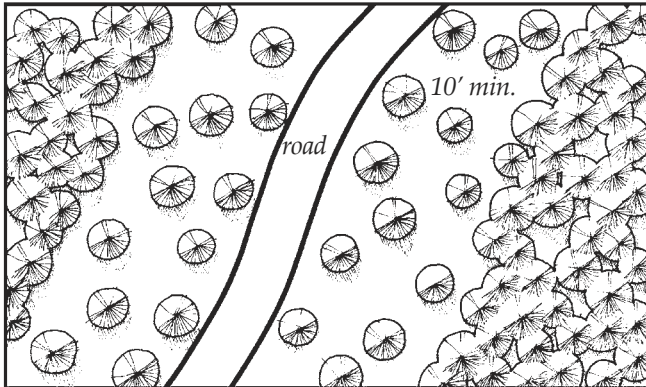
Widths are also increased when severe topographic conditions are encountered. Guidelines for fuelbreak widths on slopes are given below:

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

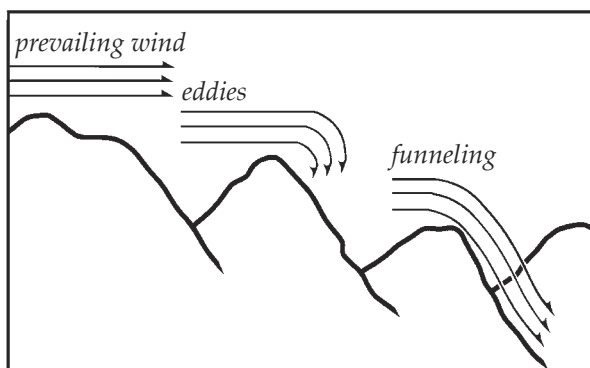
Crown separation is a more critical factor for fuelbreaks than a fixed tree density level. A *minimum* 10-foot spacing between the edges of tree crowns is recommended on level ground. As slope increases, crown spacing should also increase. However, small, isolated groups of trees may be retained for 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 F
National Wildfire Coordinating Group
(NWCG)
Safety Zone Guidelines
And
LCES Checklist

Safety Zone Guidelines

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

CALCULATIONS ASSUME NO SLOPE AND NO WIND

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

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

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

LCES Checklist

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

Lookout(s)

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

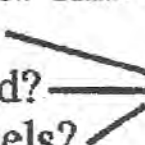
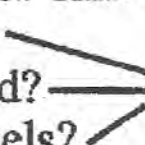
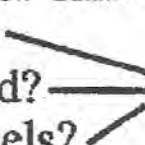
Communication(s)

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

Escape Route(s)

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

Safety Zone(s)

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

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

Appendix G

Permission for Property Use During a Declared Emergency (Sample)

Permission for Property Use During A Declared Emergency

During a Wescott Fire Protection District or El Paso County wildfire incident impacting _____ Homeowners Association, use of _____ Homeowners Association 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 _____ HOA and requiring _____ HOA land use for fighting or resolving the emergency, the _____ HOA 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 HOA board members and should be included in this Community Wildfire Protection Plan as an annual update to the CWPP. The pre-approval/property emergency-use authorization will be updated annually at the time of the annual Community Wildfire Protection Plan review and update. The aforementioned, signed emergency property-use authorization document will be provided for filing with the El Paso County Emergency Services Director, Colorado State Forest Service (Franktown District), and the DWFPD District Chief.

DECLARED-EMERGENCY USAGE PERMISSION

For

_____ **Home Owners Association**

This document authorizes emergency resolution use of _____ Home Owners Association (_____) property in the event of an El Paso County emergency event impacting the community of _____ or its surrounding area. This authorization is granted to the incident commander of the emergency for usage by professional emergency agencies and their personnel.

_____ Homeowner Association Description or Designation Usage Authorized:

Section 1: (This area will list the legal descriptions of all _____ HOA-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 El Paso County Emergency Services Director

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

Signed this ____ day of _____, ____ by _____ Home Owners Association Board of Directors:
(number) (month) (year)

President

Vice President

Secretary

Treasurer

Assistant Secretary

Appendix H

CSU Publication 6.311 Managing Gambel Oak



FORESTRY

Gambel Oak Management

no. 6.311

by N. Jester, K. Rogers, and F.C. Dennis¹

Quick Facts...

Gambel oak is commonly found throughout western Colorado between 6,000 and 9,000 feet in elevation.

Recurring fires often cause oak stands to develop into large thickets; younger thickets created in this way can become exceptionally dense and almost impenetrable for livestock and wildlife.

Control, or eradication, of Gambel oak requires physically removing the stem and as much of the root system as possible.

Gambel Oak Ecology

Gambel oak (*Quercus gambelii*), commonly found throughout western Colorado between 6,000 and 9,000 feet in elevation, generally dominates the region between the lower piñon-juniper zone and the aspen or ponderosa pine zone above. This shrub can be found throughout southern Colorado and along the Front Range almost to Denver. Gambel oak is usually found in conjunction with serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos oreophilus*), mountain mahogany (*Cercocarpus montanus*), chokecherry (*Prunus virginiana*) and a variety of forbs and grasses. In south-central Colorado, oak brush is often associated with sumac and New Mexico locust.



Figure 1. Typical oak brush growth in Colorado.

Gambel oak rarely reproduces from acorns; most reproduction is vegetative with sprouts occurring from a deep, extensive root system. Clones of oak brush spread slowly but stubbornly persist in previously colonized areas.



Figure 2. Oak brush sprouting after fire.

Recurring fires often cause oak stands to develop into large thickets; younger thickets created in this way can become exceptionally dense and almost impenetrable for livestock and wildlife. Older stands tend to form clumps with a lush understory of grass and forbs, often attaining tree-like form with heights up to 20 feet.

Oak brush provides cover and nesting habitat for many forms of wildlife (birds, mammals, amphibians, etc.). The foliage and acorns offer valuable food for many of these wildlife species, such as wild turkey, mule deer, and black bear. Acorns produced by the larger stands of oak brush are critical for turkey.

Although not highly palatable, the availability and abundance of Gambel oak, particularly on winter ranges, make this an important wildlife plant. Oak brush is especially important to mule deer; on some summer ranges it reportedly provides more deer forage than all other species combined. Elk generally rely on

**Colorado
State**
University

Extension

Gambel oak during the spring and winter. Acorns of Gambel oak are an important mast crop in many areas, particularly for black bears in the fall.

Oak brush makes excellent firewood and is used extensively for this purpose. Occasionally, this species is used for fence posts but, as a rule, does not grow to the size necessary to produce sawn wood products.

Standard Treatment Methods for Oak Brush

Various treatment methods have been used to control oak brush in western Colorado, including herbicide, mechanical treatment, and prescribed burning. In many cases, the objective of these treatments is to increase available forage for wildlife or livestock. Managed grazing of goats is also an effective treatment to reduce or eradicate oak.

Appropriate treatment is tied directly to land management objectives. As a general rule, a diversity (mosaic) of brush species, size, and densities can often accomplish multiple objectives (i.e., reducing wildfire hazards, enhancing aesthetics, screening, stabilizing soil and watershed outputs, increasing forage production, and enhancing various elements of wildlife habitat, food, cover, etc.).

Control, or eradication, of Gambel oak requires either physically removing the stem and as much of the root system as possible (typically not practical or desired) or continued top-killing of the plant so that stored energy in the root system is depleted to a greater degree than energy is restored through photosynthesis. The second option requires commitment and persistence.

Chemical Treatment

Most studies using herbicides report significant above-ground stem kill, but subsequent sprouting. In recent years, applications with Garlon have shown to be effective at completely killing oak brush when applied as either a foliar spray or as a stump treatment. For greatest effectiveness, stump treatments must be applied before the wood dries, usually within one hour of cutting.

Mechanical Treatment

Thinning oak brush by hand can be time consuming and labor-intensive due to the density of the vegetation. Prolific sprouting follows cutting unless herbicides are applied to the cut stumps. Mechanical treatments such as chaining, root plowing, dozing, and roller-chopping are somewhat expensive and cannot be used on steep slopes. Various forms of mastication equipment can also be used on oak brush such as a Hydroaxes®, Bull Hog® mowers, timberaxes, or Fecon® rotary cutting heads. Sprouting also follows these mechanical treatments even when the overstory is completely removed and additional action is needed if oak control is desired. Mechanical treatment can also make the site susceptible to weed invasion.



Figure 3. Mechanical treatment using a Hydroaxe®.



Figure 4. Mechanical treatment using a timberaxe.



Figure 5. Oak brush resprouting after fire.

Prescribed Burning

Fire readily kills the above-ground portions of oak brush. However, intense sprouting follows almost immediately and usually causes the stands to become even denser. With prescribed burning, a commitment to repeated burning on the same site is necessary to effectively reduce the oak brush over the long term.

However, prescribed fire also can be an effective tool to produce younger plants that are more palatable to wildlife.

Treating Gambel Oak for Wildfire Safety

Gambel oak does not burn readily except under favorable conditions such as during continued drought or in the fall or early spring when vegetation dries out. Late spring frosts that kill the leaves can cause extreme fire behavior later in the summer; the dead leaves have a tendency to cling to the stem and act as dry aerial fuels. Under certain conditions, fires in oak brush can spread quickly and fire behavior can be similar to fuel models in southern California (e.g., the Battlement Creek and South Canyon fires in western Colorado where a number of firefighter fatalities occurred in the oak brush fuel type).

Fuel Hazards

Fuel hazard measures refer to the **continuity**, both horizontal (across the ground) and vertical (from the ground up into the vegetation crown). Fuels with a high degree of vertical and horizontal continuity are the most hazardous, particularly when they occur on slopes. Heavier fuels (brush and trees) are more hazardous, producing more intense fires than light fuels (grass). Mitigation of wildfire fuel hazards focuses on breaking up the continuity of fuels. Increasing distances between fuels is necessary on slopes.

Standards for Fuel Mitigation

Trees: woody perennials, usually having one dominant vertical trunk and a height greater than 15 feet at maturity. Spacing requirements between trees are a *minimum* of 10 feet from the edges of the crowns. (This does not apply to mature stands of aspen trees where ladder fuels have been removed as described below. Follow the spacing requirements in areas with young aspen.)

Brush and Shrubs: woody plants, smaller than trees, often formed by a number of vertical or semi-upright branches arising close to the ground. Brush is smaller than shrubs and can be either woody or herbaceous vegetation. Thinning of brush and shrubs can often be accomplished by separating clumps rather than individual stems. *Spacing requirements* between clumps of brush and/or shrubs are 2½ times (2½X) the height of the vegetation. The maximum diameter of clumps is 2 times (2X) the height of the vegetation. (Make all measurements from the edges of vegetation crowns.)

Example: Spacing between shrub clumps 6 feet in height is 15 feet or more. The diameter of shrub clumps is less than 12 feet (measured from the edges of the crowns). Branches are pruned to a height of 3 feet. Certain brush species, such as Gambel oak, serviceberry, and snowberry re-sprout vigorously following cutting. Applying herbicide to stumps immediately following cutting may be necessary to effectively reduce long-term fire hazards. An alternative to herbicide treatment is to mow sprouts annually.

Ladder Fuels: vegetative materials with a vertical continuity that allows fire to burn from ground level up into the branches and crowns of trees. While potentially very hazardous, ladder fuels are relatively easy to mitigate. The first step in fuel mitigation is to remove all ladder fuels *beneath* tree canopies. In the remaining areas, prune all branches of shrubs or trees up to a height of 10 feet above ground (or one-half the height of the plant, whichever is least). Lastly, chip and/or remove pruned material from the site.

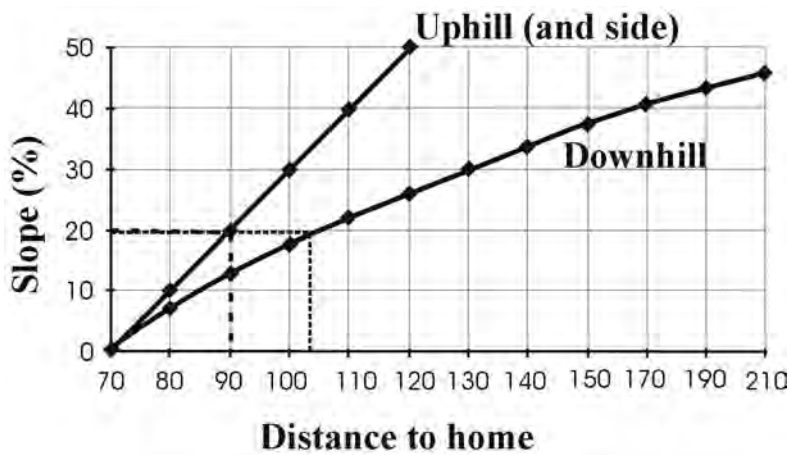
For More Information

From Colorado State Forest Service,
Colorado State University, Fort Collins,
CO 80523-5060; (970) 491-6303; csfs.
colostate.edu:

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

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

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



Grasses: mow dead, dry grass to a height of less than 6 inches.

Slope Adjustment Factors

The minimum distance from a structure for brush, shrub, and tree fuel treatment is **75 feet on level ground**. (Where only grasses exist and no additional vegetative landscaping is planned, the minimum distance is 30 feet.)

On slopes *downhill* from structures, complete defensible space thinning according to the distances in Table 1. Uphill and side distances remain 75 feet, unless the property slopes in multiple directions.

Table 1. Defensible space thinning guidelines.

1 percent to 20 percent slopes =

Brush/shrubs	75' from structure; 3X height separation distance between vegetation.
Trees	75' from structure; 10-foot crown separation distance between trees.
Grass	30' from structure; mow dead, dry grass to 6 inches or less in height.

21 percent to 40 percent slopes =

Brush/shrubs	150' from structure; 4X height separation distance between vegetation.
Trees	150' from structure; 20-foot crown separation distance between trees.
Grass	50' from structure; mow dead, dry grass to 6 inches or less in height.

Greater than 40 percent slopes =

Brush/shrubs	200' from structure; 6X height separation distance between vegetation.
Trees	200' from structure; 30-foot crown separation distance between trees.
Grass	75' from structure; mow dead, dry grass to 6 inches or less in height.

For more information or professional assistance in managing your forest, contact your local Colorado State Forest Service district office.



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

¹Colorado State Forest Service foresters.

Colorado State University, U.S. Department of Agriculture, and Colorado counties cooperating. CSU Extension programs are available to all without discrimination. No endorsement of products mentioned is intended nor is criticism implied of products not mentioned.