



Community Wildfire
Protection Plan

Prepared For

Roxborough Park Foundation
April, 2007

By

The Roxborough Park Fire Mitigation Committee

And

Keith Worley, Forester
Forestree Development, LLC
7377 Osage Road
Larkspur, Colorado 80118



Table of Contents

	<u>Page</u>
Foreword, INTRODUCTION AND ACKNOWLEDGEMENTS	4
Chapter 1, EXECUTIVE SUMMARY	5
Chapter 2, GOALS, PLAN COMPONENTS AND ON-GOING MAINTENANCE OF PLAN	7
• Goals and Objectives	
• Plan Components	
• Maintenance of the CWPP	
Chapter 3, BACKGROUND AND HISTORY	10
• Geographic and Ecological Location	
• History of Roxborough Park	
• Wildland Interface Impact Areas	
• Wildfire History	
Chapter 4, WILDFIRE HAZARD ASSESSMENT	17
• Methodology and Strategies	
○ Identification and Prioritization of Potential Fire Breaks on RPF Land	
○ Quadrant 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	27
Chapter 6, SERVICES INFRASTRUCTURES, WILDLAND FIRE RESPONSES	31
• Professional Wildland Fire Response Services	
○ Douglas County Emergency Services	
❖ Hazard Response Plan	
West Metro Fire Protection District	
❖ Fire Response Plan	
❖ Water Resources and Safety/Staging Areas	
❖ Emergency Medical Services	
• Internal Volunteer Services and Communication	
• Roxborough Security Guards	
• RPF Maintenance Staff	
• Egress and Ingress Routes / Evacuation	
• Street Signage and Sight Distances at Intersections	
• Critical Utilities	
○ Electrical Power – <i>Intermountain Rural Electric Association</i>	
○ Natural Gas – <i>Aquila</i>	
○ Water – <i>Roxborough Metropolitan District</i>	
○ 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. CWPP Treatment Area
- B. Refuge Zones and Staging Areas
- C. Permission for Use of RPF Properties During Declared Emergencies
- D. Evaluation and Monitoring Sample Form
- E. West Metro Fire Response Procedures and SOP
- F. Fire Hazard Classes and Fuel Models
- G. Common Terms- National Fire Danger Rating System
- H. Annual Operating Plan for Douglas County (update when available)
- I. Roxborough State Park Fuel Management Plan
- J. Fuel Break Guidelines for Forested Subdivisions
- K. Firewise Household Tips, Property Mitigation and Protection
- L. CSFS Minimum Standards for Community Wildfire Protection Plans

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

INTRODUCTION AND ACKNOWLEDGEMENTS

The Roxborough Park Community Wildfire Protection Plan (CWPP) is a broad plan focused on the protection of residents, structures and scenic environment of Roxborough Park from catastrophic wildfires. The CWPP represents a collaboration of United States and Colorado State Forest Services, Douglas County and Roxborough Park Foundation and its Fire Mitigation Committee. The CWPP is intended as a *living document* and will be updated as wildfire mitigation and firefighting methodologies and support technologies change. The Roxborough Park CWPP is sponsored by the Roxborough Park Foundation. This CWPP follows the guidelines set forth in the *Health Forest Restoration Act of 2003* and the *Colorado State Forest Service Minimum Standards for Community Wildfire Protection Plans* (See Appendix L).

ACKNOWLEDGEMENTS

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

- West Metro Fire Protection District
- Douglas County Law Enforcement and Emergency Services
- Colorado State Forest Service
- United States Forest Service
- Colorado State Parks

Appreciation is also extended for information and support material to:

- Intermountain Rural Electric Association
- Roxborough Water and Sanitation District
- Arrowhead Golf Club
- Douglas County Board of County Commissioners
- Douglas County Departments: Public Works, Building, and GIS
- Douglas County Public Library
- Roxborough Park Foundation Staff

EXECUTIVE SUMMARY

The Roxborough Park Community Wildfire Protection Plan (CWPP) is sponsored by the Roxborough Park Foundation for the safety of life and protection of property in Roxborough Park and its immediate vicinity. Participating in the establishment of this CWPP was a broad stakeholder group including Federal, Colorado State and Douglas County agencies. Development of this CWPP focused primarily on wildfire hazard identification, fuel mitigation and emergency response. The fuel mitigation focused on specific wildfire risk areas with heavy fuel densities and terrains that could be used for protection and wildfire prevention advantage, coupled with close attention paid to upholding ecological values. Wherever possible, other values such as wildlife habitat enhancement, forest health restoration, improved aesthetics and increased property values were factored in.

Roxborough Park is no stranger to wildfires and the need for wildfire prevention and protection. The 1994 Carpenter Peak Fire burned 19 acres directly above the community. Smaller lightning caused fires are a regular occurrence. The proximity of Roxborough Park to the Buffalo Creek Fire (1996, 11,000 acres, 5 miles away), Hi Meadows Fire (2000, 12,000 acre, five miles away) and the Hayman Fire (2002, 138,000 acres, 9 miles away) emphasized the fact that wildfires “*can happen here!*” In 2004, the Roxborough Park Foundation (RPF) recognized the importance of developing a program to address the wildfire risk to the community. It began by budgeting funds for fuel treatments and development of a long range plan for wildfire protection. The RPF was guided by a committee of concerned residents that had formed a “Fire Mitigation Committee” to advise the RPF Board of Directors. The committee had worked in the past with the Colorado State Forest Service and had occasional contacts with US Forest Service Representatives.

Roxborough Park has three significant areas outside of its boundaries that could pose a potential wildfire fire threat to the community. These areas termed in total as the *Wildland Urban Interface* (WUI) area consist of: the South Platte watershed west and northwest of Roxborough Park; Roxborough State Park which surrounds the south half of the community on three sides; and, the Pike National Forest that abuts the northwestern part of the community. With this CWPP, care was taken to propose and provide mitigation within Roxborough Park to provide fuel breaks to lower the risk of spreading wildfire and to protect residents from potential wildfire intrusion from the various risk sections of the adjoining WUI. Fifty-six such areas of varying degrees of mitigation were identified within the community. Initial treatment for these areas will be reviewed annually for scheduling with full completion to take from seven to twelve years, depending on availability of funds from multiple sources. On-going maintenance will be required for treatment areas. Gambel oak treatments should be monitored annually for re-sprouting. It is anticipated brush control may be needed every three to five years.

Four primary strategies are employed to achieve mitigation: 1) RPF providing fuel mitigation treatment to RPF owned land and critical private parcels; 2) Encouragement and support of private land owners doing their own wildfire fuel mitigation; 3) Working with Douglas County and other stakeholder agencies to require developers of stand-alone, undeveloped areas within Roxborough Park to mitigate their land before building occurs; and 4) support of on-going fuel and future treatment projects in Roxborough State Park, Denver Water and Pike National Forest, and to explore the possibility of additional wildfire fuel mitigation in the wildland urban interface areas bordering Roxborough Park.

This CWPP identifies the response, both from professional agencies and volunteer groups that may be employed for wildfire protection or fire suppression, arresting wildfires threatening areas within or the whole of Roxborough Park. Douglas County Law Enforcement and Emergency Services in conjunction with West Metro Fire Protection District (WMFPD) have the primary responsibility for protecting life and property in Roxborough Park in the event of a wildfire incident. If a wildfire event is beyond their resource capability, the County (inclusive of WMFPD)

are parties to a mutual aid agreement for support being provided outside of normal jurisdiction, adjacent agencies; e.g., Douglas and Jefferson County based resources.

The Roxborough Park CWPP also discusses direct communication and informational efforts to notify residents and keep them apprised of emergency wildfire situations directly affecting them. The severity of the emergency will determine the level of communications and support.

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

This CWPP is a “*living*” document that will be evaluated and maintained annually as a responsibility of the RPF Board of Directors and Fire Mitigation Committee. Each individual project identified within this plan has a measured baseline; i.e., current condition description of its “*before*” profile that will be used to evaluate the effectiveness of any fuel reduction project performed on it during the plan year. Consequently, this plan may be amended and edited annually to assure that it stays viable and achieves its original intent. Annual meetings will be held with stakeholder agencies to review the progress and effectiveness of this CWPP. A general public meeting will 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 Roxborough Park CWPP was developed for the safety of life and protection of property from wildfire emergencies within the boundaries of the Roxborough Park Foundation 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 Roxborough Park Community Wildfire Protection Plan addresses the areas of wildfire hazard mitigation and emergency response to the impact of widespread wildfires. The plan has three major focus areas: fuel mitigation, emergency response and the influencing and obtaining of federal grants. In addition, the plan contains administrative detail for plan implementation and monitoring and also sets forth tactics for amending the plan on an on-going basis as circumstances and changing conditions may require.

Goals and Objectives of the Plan

Fuel Mitigation:

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

Emergency Response:

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

Federal Grants:

- To influence where and how federal agencies implement fuel reduction by proposing alternative locations and methods for treatment on federal lands in our watersheds.
- To assist in the acquisition of federal funds for Roxborough Park for wildfire hazard(s) mitigation and response related projects.

Administration and Plan Maintenance:

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

Plan Components

The Roxborough Park Community Wildfire Protection Plan provides four primary sections to the six following chapters plus reference information. Geographical and ecological background along with forest management and wildfire history is detailed in Chapter 3. Chapter 4 covers the Wildfire Hazard Assessment. Chapter 5 covers Emergency Egress. Chapter 6 addresses the resources for addressing wildfires. Chapter 7 identifies communication and information support for the residents in and around Roxborough Park in the event of a wildfire emergency. Finally, Chapter 8 is the implementation plan of the

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

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

Maintenance of the Plan

The overall goal of maintaining the Roxborough Park Community Wildfire Protection Plan 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 Roxborough Park CWPP is meant to be a “*living document*” which is updated periodically to assure currency in both wildfire prevention and planned response to wildfire situations both in Roxborough Park’s wildland/urban interface areas and inside Roxborough Park proper.

Each year, at the August meeting of the Roxborough Park Foundation board, the board will formally request its Wildfire Mitigation Committee to conduct an 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 RPF budget cycle. The overall evaluation and recommended changes to the CWPP will be presented and addressed at the October RPF board 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 RPF budget for the following year.

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

Formal CWPP overall evaluation will consist of 1) implementation monitoring, 2) baseline monitoring, 3) effectiveness monitoring 4) validation monitoring and 5) trend monitoring. Implementation monitoring and trend monitoring are board assessments of the overall CWPP. Baseline, effectiveness and validation monitoring deal at the specific project or project grouping level and assess the degree of success of the individual project. A sample “Project Monitoring Worksheet” is attached as **Appendix D** and addresses the following issues:

- 1) *Implementation Monitoring*: Will track the CWPP project(s) as laid-out for the year and assess the success level of execution;
- 2) *Baseline Monitoring*: Will be conducted in conjunction with *Effectiveness Monitoring*. Baseline data will be collected prior to each project’s implementation to characterize the existing conditions specifically for comparison to post project conditions and will provide a basis for effectiveness monitoring (See Appendix K, *Mitigation Area Descriptions and Baseline Data*).
- 3) *Effectiveness Monitoring*: Will determine if the project activities scheduled during the year were effective in achieving the stated goals and objectives based on comparison of “pre” (baseline) and “post” project conditions. Effectiveness monitoring asks, “*Was the result of the project as we had planned?*”
- 4) *Validation Monitoring*: Determines if certain assumptions and data used in the development of the project were valid. If the assumptions were invalid,

documentation as to why or how they were invalid should be undertaken to prevent future errors of assumption.

- 5) *Trend Monitoring*: Is designed to detect changes over time, and is useful for assessing how fuel mitigation and forest management activities occurring throughout the Roxborough Park targeted watershed areas are impacting wildfire reduction as well as the landscape.
- 6) *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 CWPP goals and objectives.

BACKGROUND AND HISTORY

Geographic and Ecological Location

Roxborough Park is a 2220 acre Rocky Mountain Foothills' community five air miles west of Sedalia, and four airline miles south of Chatfield Reservoir. Located approximately 20 miles from downtown Denver to the northeast, Roxborough Park's major residential development started in 1971. (see Figure 1) It has grown to a current configuration of 900 homes. Full build-out of Roxborough Park has the potential of 1,050+ homes. The east central portion of Roxborough Park accommodates a 220 acre golf course with several man-made bodies of water. The Aurora Rampart Reservoir, fed by Aurora Rampart Tunnel No. 2, and Foothills Treatment Plant are located northeast of the community.

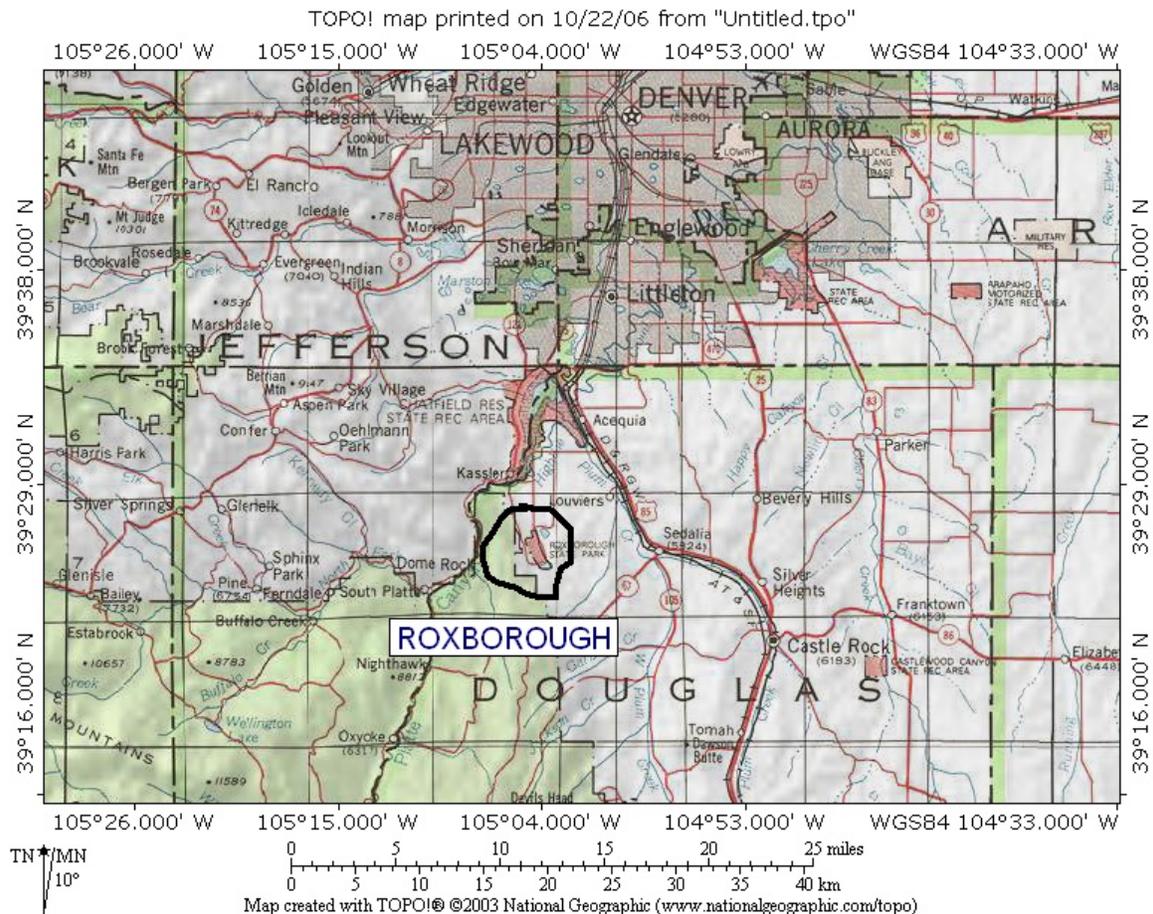


Figure 1. Vicinity Map

Roxborough Park is a classic wildland urban interface community abutting the South Platte Ranger District of the Pike National Forest on the northwest, and surrounded by Roxborough State Park on three sides of the southern half of the community. Privately-owned mining land abuts on its northeastern border. Ravenna, a new golf course community, wraps the northern section of the community. To its east and north Roxborough Park slopes downward to high elevation prairie terrain. Roxborough Park's average elevation is approximately 6,100 feet, varying greatly from gentle zero to fifteen percent slopes associated with its eastern, northeastern-most sections ramping to more extreme slopes of thirty to one hundred percent in its

western and southern areas. Vegetation consists of dense stands of Gambel oak, scattered ponderosa pine and Douglas-fir and prairie grasses.

History of Roxborough Park

The area within the boundaries of Roxborough Park is predominantly historic grazing lands as part of early ranching in the area. The area was first visited by the Stephen Long expedition in 1820. Very little logging is evident given the historic absence of heavy tree cover. Several old logging trails wound their way into the community from the foothills to the west. The fire regime for the area historically created a diverse mosaic of plant communities that may have burned on a ten to fifty year cycle. Evidence of this mosaic can be seen in historic 1800's photos of the area. Wildfires have been suppressed over the past 100 years. The Roxborough Park community, created in the early 1970's, has grown steadily with significant in-fill growth taking place over the last ten years.

Mining is an important part of Roxborough's history. Several inactive mines are found in the area. Most material was extracted by open-pit mining. An active quarry operation is on-going by Robinson Brick Company along the northeast hogback and overlooks the Roxborough Village community.

The Roxborough Park Foundation ("RPF") was established at the beginning of the residential community and serves as the governing body for the community. The Fire Mitigation Committee was formed in 2003 to assist the board of directors in making the community more fire resistant. A number of large, landscape scale fires had occurred in the South Platte Watershed west of Roxborough since 1996. The area is very prone to lightning caused fires. Roxborough was evacuated under a voluntary evacuation order during the 138,000 acre Hayman Fire of 2002.

Roxborough Park Foundation maintains a yard-waste and slash disposal site for all residents. Material deposited at the site is processed at least two times per season. The community has received small grants within the past five years to address wildfire issues. The Foundation recently began budgeting funds annually for fire mitigation. In 2005, the Foundation budgeted funds to develop its Community Wildfire Protection Plan (CWPP). A professional forester was engaged to complete the plan in January 2006.

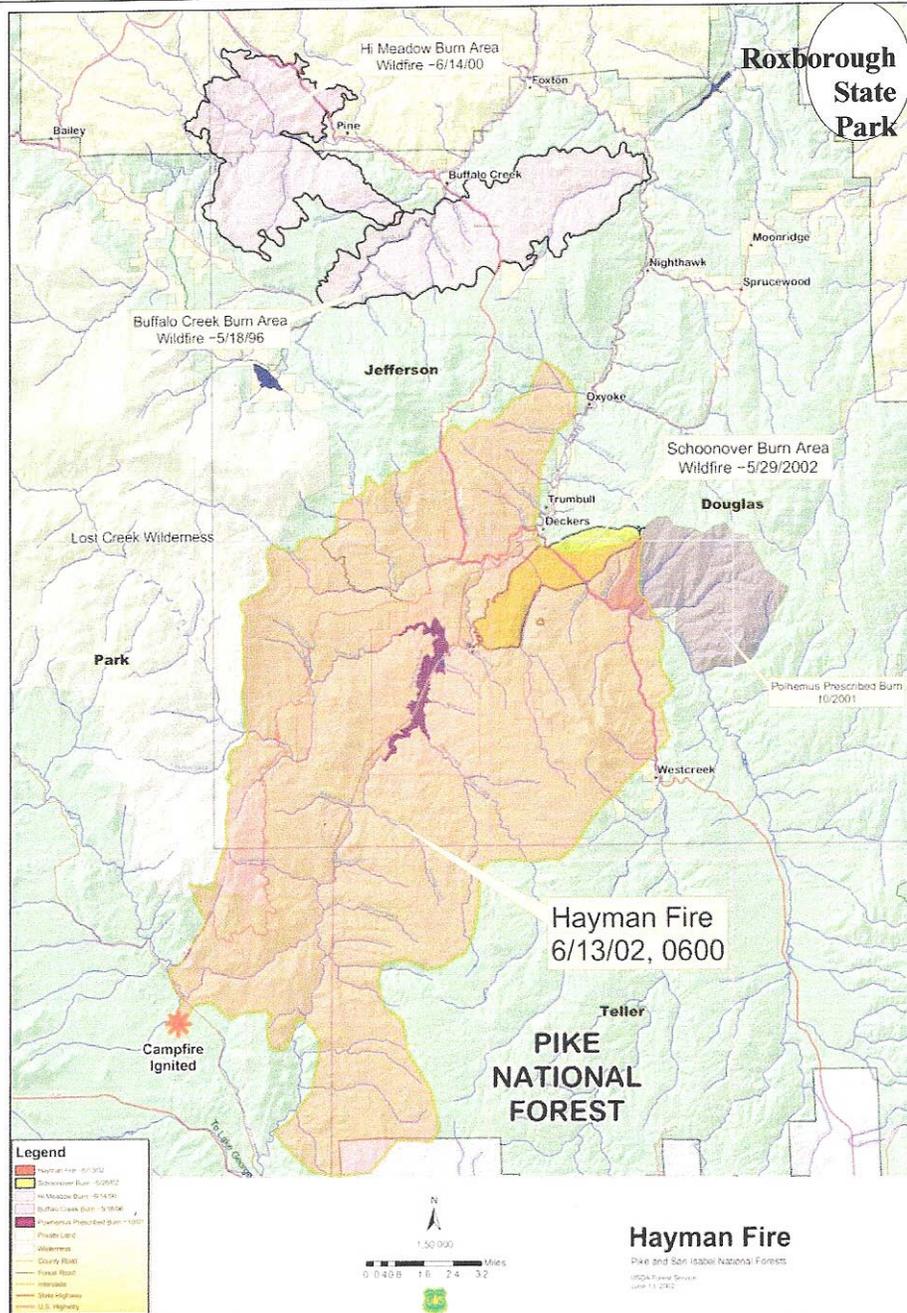
Transportation planning has been an on-going function of the Foundation. All paved roadways within the community are privately owned and maintained by RPF. Roxborough is currently served by one full-time access point at Roxborough Drive and Rampart Range Road. The complete transportation network for Roxborough was never completed due to a bankruptcy of the original developer. This resulted in the loss of lands necessary to complete alternate ingress/egress routes for the community. Discussions have been on-going with Douglas County to obtain alternate emergency egress routes. Two new emergency egresses are currently planned through the Ravenna Community.

The South Platte Watershed has been severely impacted by wildfire over the past ten years. The Front Range Fuel Treatment Partnership, a multi-agency group, was formed and funded to implement major fuel treatments in the watershed. Numerous fuel treatments are planned for areas west of Roxborough. These will aid in reducing catastrophic wildfire intensity west of Roxborough. All projects are subject to funding and staffing limitations, access, environmental issues (ie, Threatened and Endangered Species), and recreation issues.

Wildfire History

Over the past decade, Roxborough Park has escaped two wildfires in its proximity: the Buffalo Creek Fire of 1996 and the Hayman Fire of 2002. The Buffalo Creek Fire, a human caused fire, burned approximately 11,000 acres five miles west of Roxborough in the South Platte Watershed.

The burn area was in extreme terrain and driven by down canyon winds. The 138,000 acre, human started Hayman Fire of 2002 had a significant impact on Roxborough Park even though fire fighting held it within nine miles southwest of Roxborough. During the height of the Hayman Fire, the fire's *Incident Command* issued a voluntary evacuation order to evacuate the community for the safety of its residents; consequently, the Hayman Fire had and has left a lasting impression on the residents of the Roxborough Park. A fire history map is shown as Figure 2.



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

Figure 2. Wildfire History in the South Platte Watershed

Wildland Urban Interface (WUI) Impact Areas

With the high potential of ground lightning ignition, the Pike National Forest, Roxborough State Park and Denver Water lands west of Roxborough present the greatest catastrophic wildfire threat to the Roxborough's residential areas. Waterton Canyon, along the South Platte River, consists of very steep terrain. This canyon was the anticipated route of fire into Roxborough during the 2002 Hayman Fire.

It should be remembered that wildfires can also spread from Roxborough into the surrounding areas. Human caused ignitions have the potential to burn into the National Forest and State Park.

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

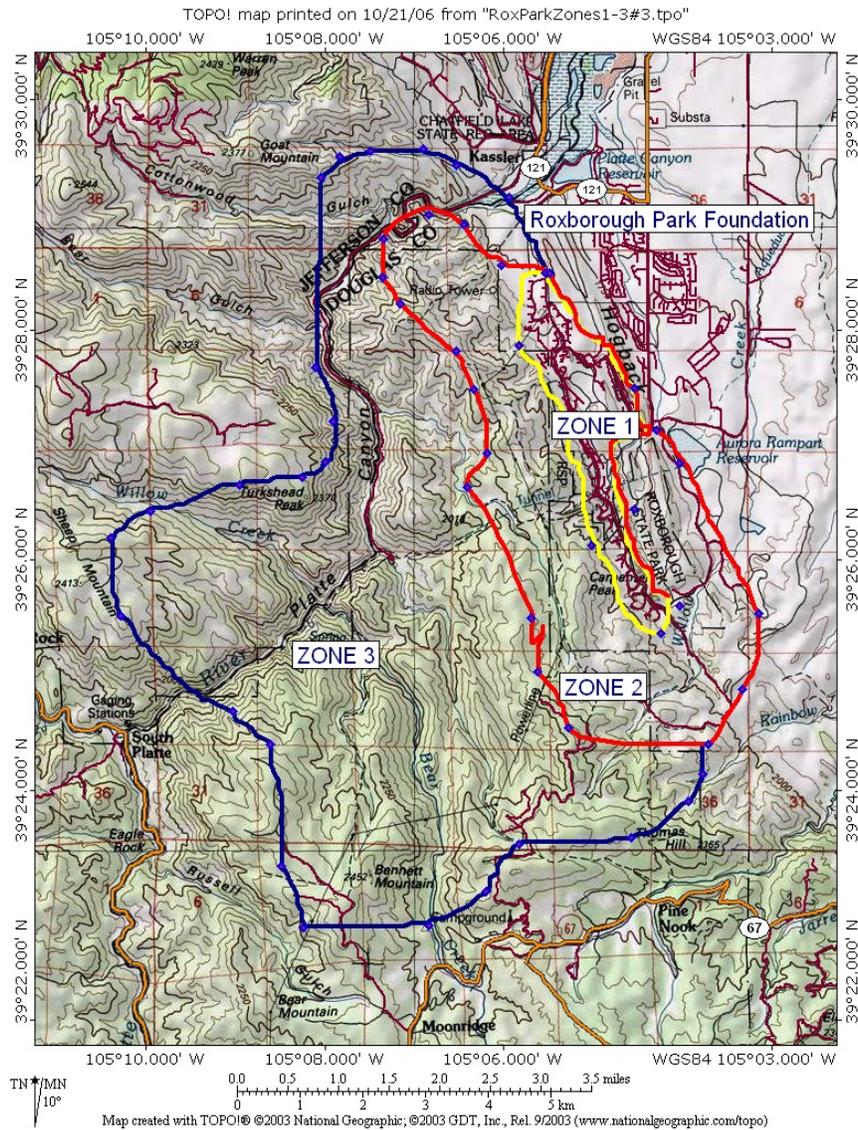


Figure 3. Roxborough WUI Zones

Zone 1

Zone 1 is the Roxborough Community shown in Figure 4. It consists of the community and Arrowhead Golf Course and is approximately 2220 acres in size. The Foundation owns approximately 300 acres as common area and rights-of-way. The golf course is approximately 220 acres and consists of primarily irrigated or manicured areas. Wildfire risk is low within most of the golf course.

Fuel treatment projects are earmarked to begin on Foundation properties in 2006. The remainder of the property is held privately. Homeowners and property owners have been encouraged to implement Firewise guidelines around all structures through educational efforts of the Foundation, West Metro Fire Protection District and Colorado State Forest Service.

Removal of trees and vegetation is strictly controlled by the RPF Design Review Committee under the RPF Covenants, Conditions and Restrictions (CC&R's) and Design Guidelines. A procedure was developed as part of the CWPP process to allow individual property owners to mitigate their fire risks. Owners are required to obtain an inspection from a fire professional and/or the fire department as part of their mitigation efforts. Douglas County provides some wildfire mitigation oversight for new construction using an amended version of NFPA-299 as a requirement. More specific wildfire mitigation planning for Zone 1 is covered in Chapter 4.

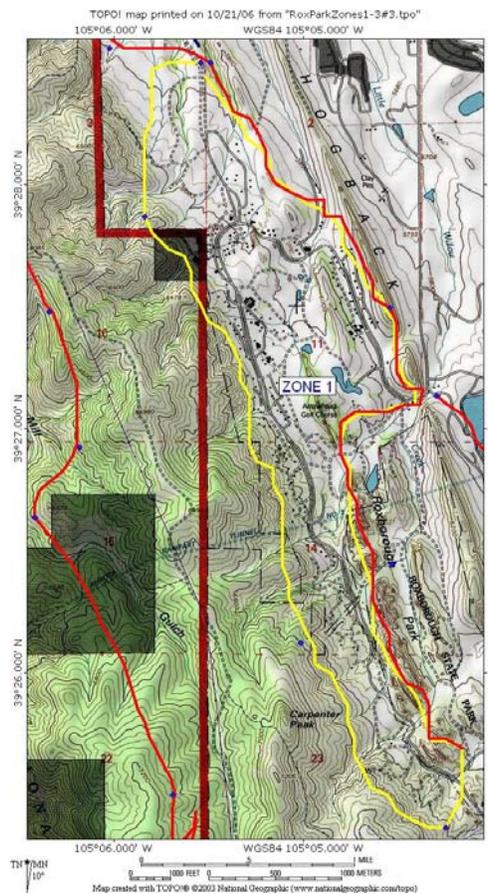


Figure 4 Roxborough Zone 1

Zone 2

Zone 2 is the adjoining Wildland Urban Interface. The major owners within this zone are Roxborough State Park, Denver Water and USDA Forest Service (Pike National Forest). This area covers all lands around Roxborough Park's western boundary and surrounds the southern half of the community. The western boundary of this zone was set utilizing planning areas outlined in the Roxborough State Park Fuel Treatment Plan. An overview of fuel treatments planned in this zone is covered in Figure 5.

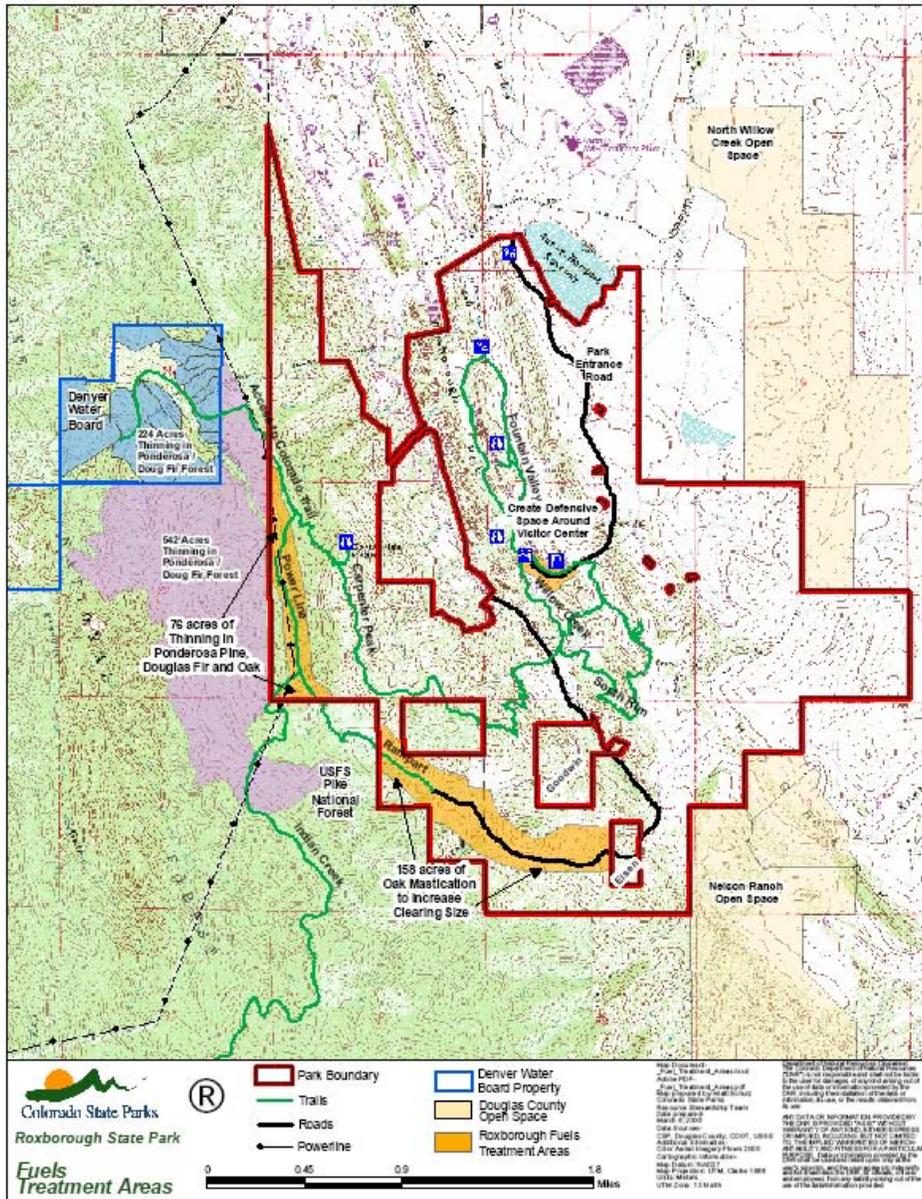


Figure 5. Fuel Treatments in Zone 2

Fuel treatments on State Park lands are scheduled to begin in 2007.. USFS projects are planned for 2008 if funding is available.

No fuel treatments are planned along the community boundary at this time. However, discussions are on-going with State Park and Colorado State Forest Service personnel to target these areas as a high priority in future years. In order for the Foundation to protect the community, negotiations should continue to allow RPF property owners to treat abutting State Park properties with the permission of State Parks. Any USFS treatments, implemented by RPF on USFS property, would operate under a "Good Neighbor" agreement, which must be created, approved, and supervised by CSFS personnel and coordinated with South Platte Ranger District Staff.

Zone 3

Zone 3 is the extended area in which watershed and landscape scale wildfires will pose a risk to the community. The western boundary is generally west of Strontia Springs Reservoir and extends south to the Russell Ridge/Bear Mountain area. A high percentage of the watershed is now covered by Community Wildfire Protection Plans. The Front Range Fuel Treatment Project has targeted the area for high priority treatment due to impacts to water quality in the South Platte Watershed. Unfortunately, a high percentage of lands within Zone 3 are inaccessible or inoperable for treatment. Discussions should continue with Roxborough Park Foundation on its roadway usage agreements for access to areas west of Roxborough Park. Typically, a "user fee" is required by RPF for use of its private roads. Negotiations should occur on a usage agreement that is acceptable to USFS and/or Denver Water that could consider use of a "bond" or other form of surety.

Zone Totals

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

Zone 1- 2,220 acres
Zone 2- 4,952 acres
Zone 3- 10,690 acres

Total Acres = 17,862 acres

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

WILDFIRE HAZARD ASSESSMENT

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

Methodology and Strategies

The developed portion of Roxborough Park contains four major “*Refuge zone*” areas: the Roxborough Drive roadway medians from Silverthorne Run to Pine Bark and from the entrance station to Choke Cherry Way; the Arrowhead Golf Course; and Haney Park. A fifth refuge zone will be in place upon completion of the Ravenna Golf Course. The Arrowhead Course is centrally located within the community. It is accessible from Pine Park and the Emergency Egress Easement via Rain Dance Trail. The Ravenna Course will be accessible from the new emergency egress at the end of Roxborough Drive North. The Roxborough Drive Median is central to the community. The south end of the community (South Compartment) has poor access to any refuge zones. Extending away from the major “*refuge zones*” are various mixtures of heavily developed areas and scattered undeveloped areas, both of these area types vary in the concentration of vegetation stands from significantly mitigated lots to dense stands of ground, ladder and crown fuels. The southern area of Roxborough Park, specifically land in the Ponderosa Trail/Coyote Run area is essentially undeveloped and is characterized as typical, untreated scrub and forest land with wildland grasses, heavy areas of Gambel Oak and dense pockets of Douglas-fir...all of which is intermingled with dry fuel from freeze and drought damage.

Two primary decision considerations were used in the methodology for identifying potential fuel treatments within the developed areas of Roxborough Park: established road (both paved and rough) rights of way, and “*connections*”. For proposed fuel treatments tying to roads, mitigation widths of sixty (60) feet were considered for ease of use since that footage corresponded with road rights of way; i.e., thirty (30) feet either side of the centerline of the designated road. It should be noted that the 60 feet is for ease in assisting quicker access since it corresponds with most road rights of way. It should also be noted that negotiations should be undertaken with private land owners adjacent to road rights of way areas as well as private lands in general to build fuel treatments with widths as specified by the Colorado State Forest in its *Fuelbreak Guidelines for Forested Subdivisions* (See Appendix L). For ease of planning in this Community Wildfire Protection Plan, wildfire fuel treatments in unimproved areas such as ground trails or across solid stands of vegetation, were also preliminarily considered to be sixty feet wide for ease in estimating acreage and costs in these areas prior to baseline data studies of each of the areas. The length of the proposed fuel treatment, coupled with the width of the break and the density/types of vegetation in the break area were used to calculate the estimated costs of mitigation associated with each proposed fuel treatment / mitigation project area. An additional factor of ten percent was added to the acreage to account for measurement discrepancies.

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

For undeveloped areas within Roxborough Park, such as specific areas within dense, untreated forests, potential mitigation would cover a much broader expanse of land than the wildfire fuel breaks considered for protecting developed properties.

Compartment Locating and Project Labeling

This Community Wildfire Protection Plan divides Roxborough Park into four quadrants or compartments, utilizing Transportation Committee mapping and sectioning. Within each compartment, sub-compartment treatment areas and “*connection*” fuel treatments are prioritized by wildfire impact risk and assigned a label, identifying the compartment area, the sub-compartment or connection break, and the mitigation priority. The fire hazard class will use the five-classifications used by the Colorado State Forest Service (See Appendix F, *Fire Hazard Classes and Fuel Models*).

Compartments will be identified as N, E, W, S (north, east, west, or south). Sub-compartment or mitigation projects will carry a number designation. Mitigation priority levels will range from the highest to lowest on a 1 (highest) through 4 (lowest) priority rating. Hence, a mitigation area will carry a designation such as: “S-2-1” ...meaning the mitigation area is within the south compartment; it is specifically project area 2 within the compartment is a project of the highest priority. The compartment boundaries are shown on the detail map below.

Project treatment areas planned for 2006 and 2007 are shown as Projects 1-1 to 1-4 (2006) and 2-1 to 2-15 (2007). This numbering was retained in order to correspond with the 2006 and 2007 budgets that are already in place. Both present and future projects are shown in Appendix A.

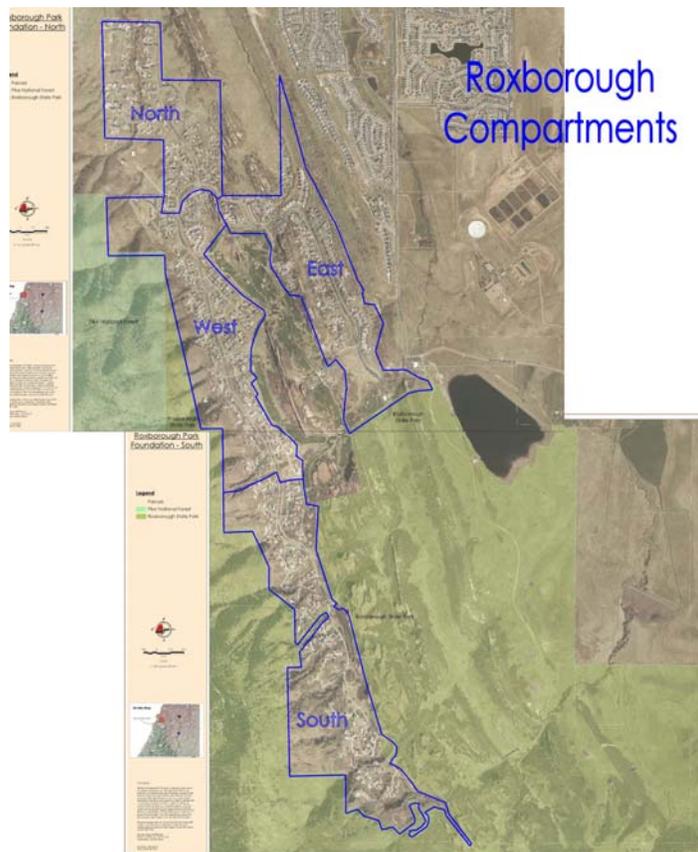


Figure 1. Compartments

Three Proposed Mitigation Strategies

The Roxborough Park 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 Way and Roxborough Park Foundation Land

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

Private Homeowner and Landowner Properties

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

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

Undeveloped, Publicly-owned Properties

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

Proposed Wildfire Fuel Treatment Areas

As indicated at the beginning of this chapter, Roxborough Park is divided into compartments for the process of locating and defining potential wildfire fuel treatment needs. This information is shown below using compartment maps for the reader to reference and detailed on a compartment by compartment basis using the three character alphanumeric label (as specified in the second paragraph of this chapter) to designate project location, specific fuel treatment, and mitigation priority. Also shown is the location description, estimated mitigation acreage of the proposed fuel treatment and broad, estimated cost of the project. By using the maps, the reader

should also be able to gain a sense of how fuel treatments were laid-out to develop fire limiting sub-compartments within the compartment.

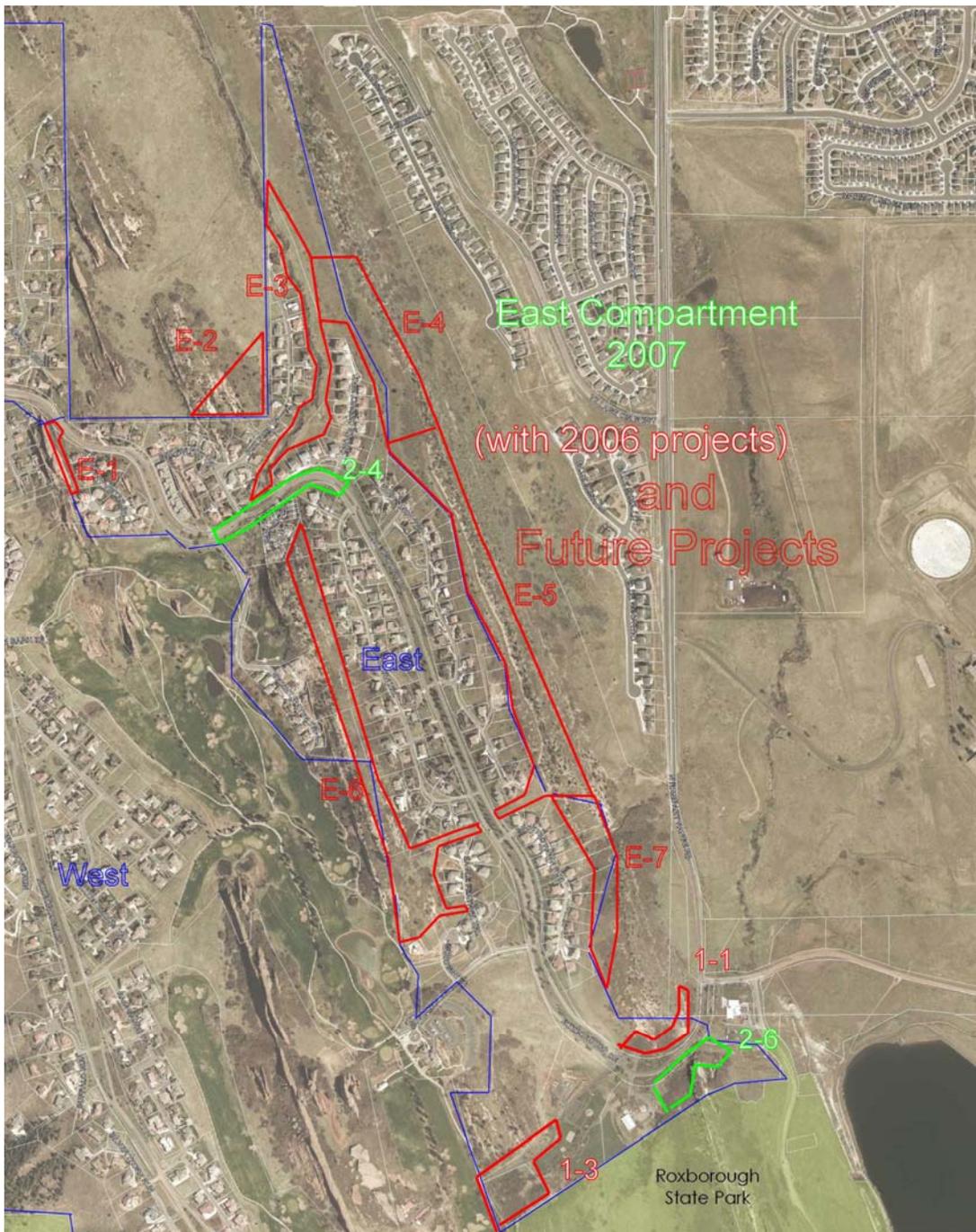


Figure 2. East Compartment (E)

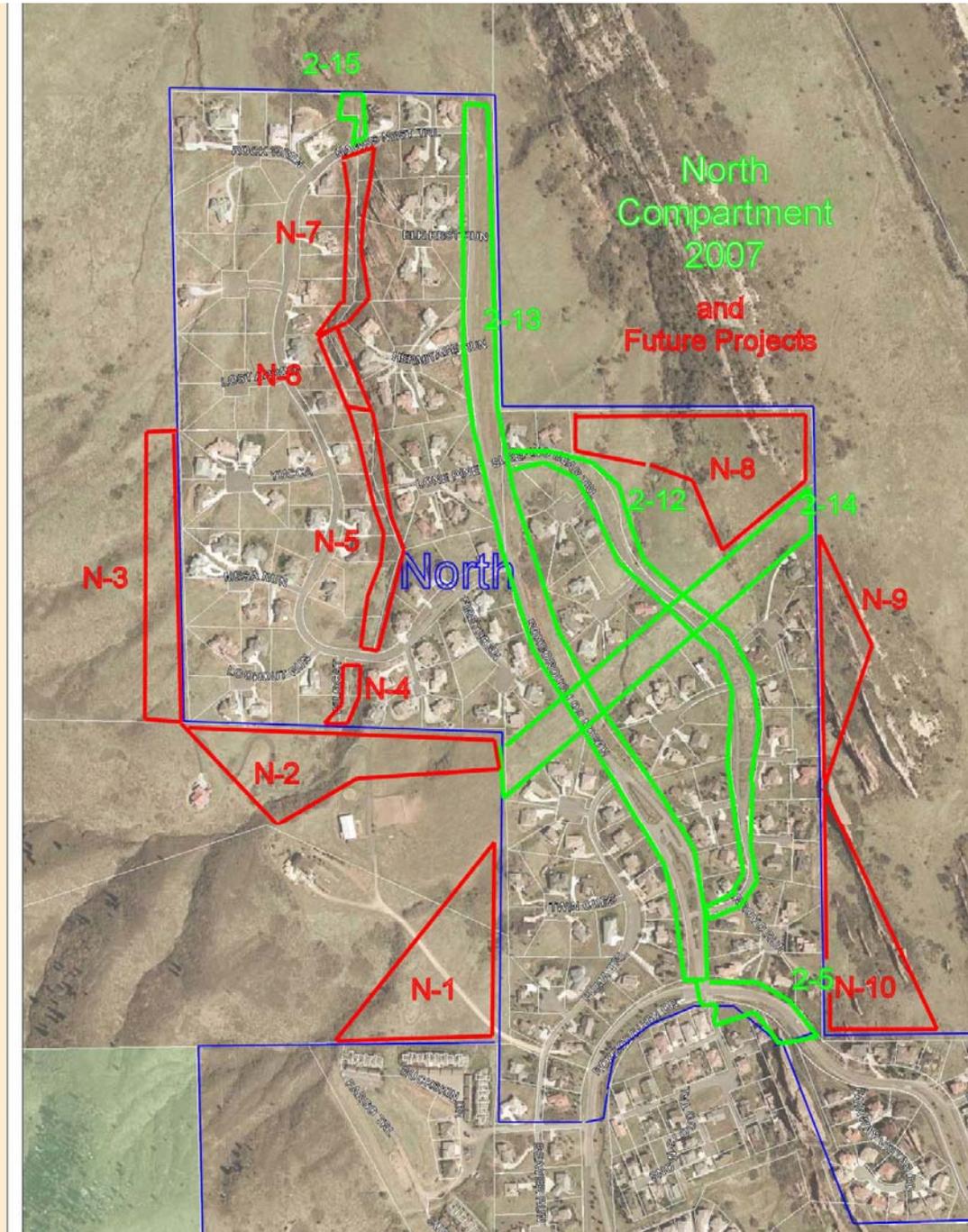


Figure 3. North Compartment (N)

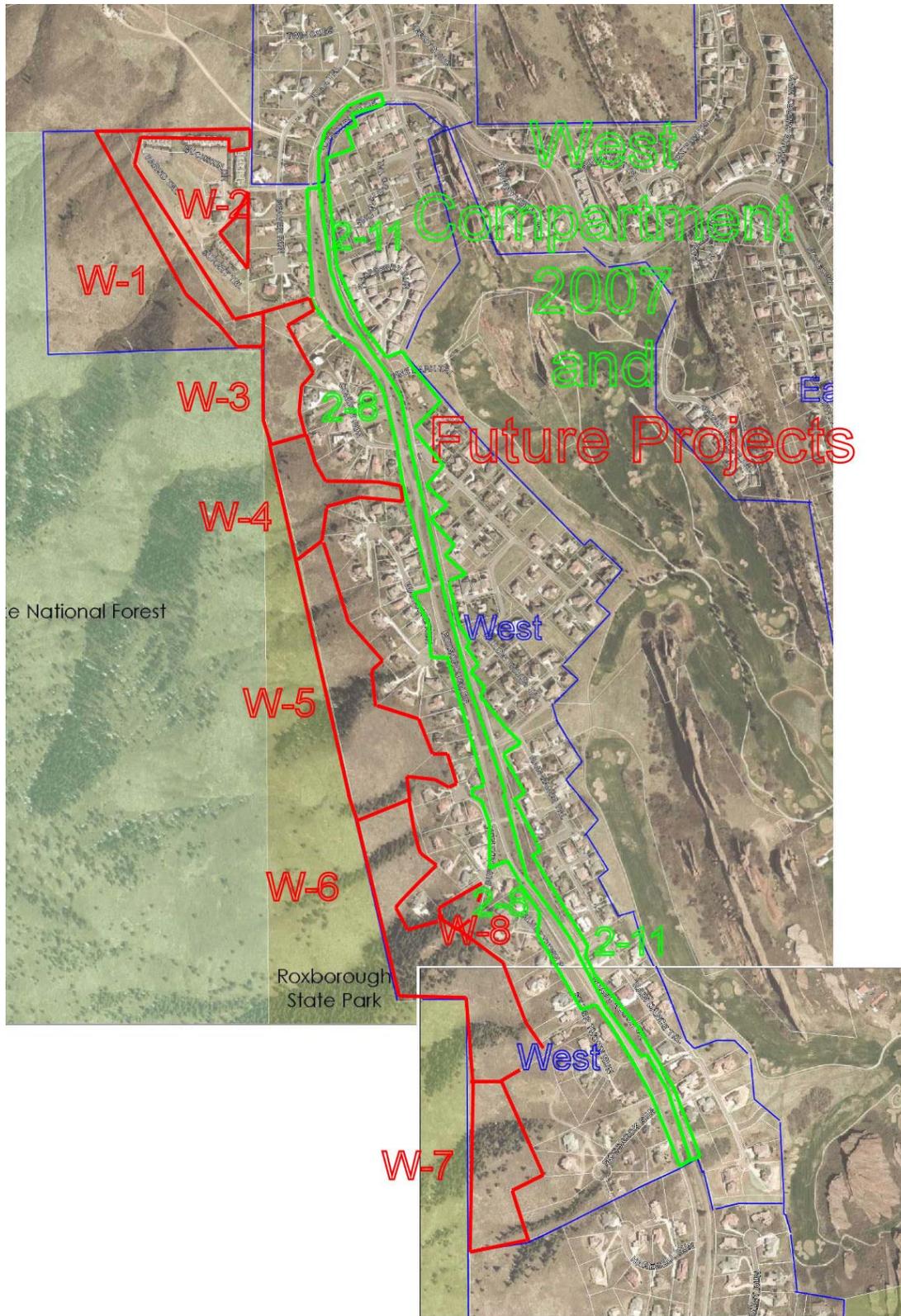


Figure 4. West Compartment (W)

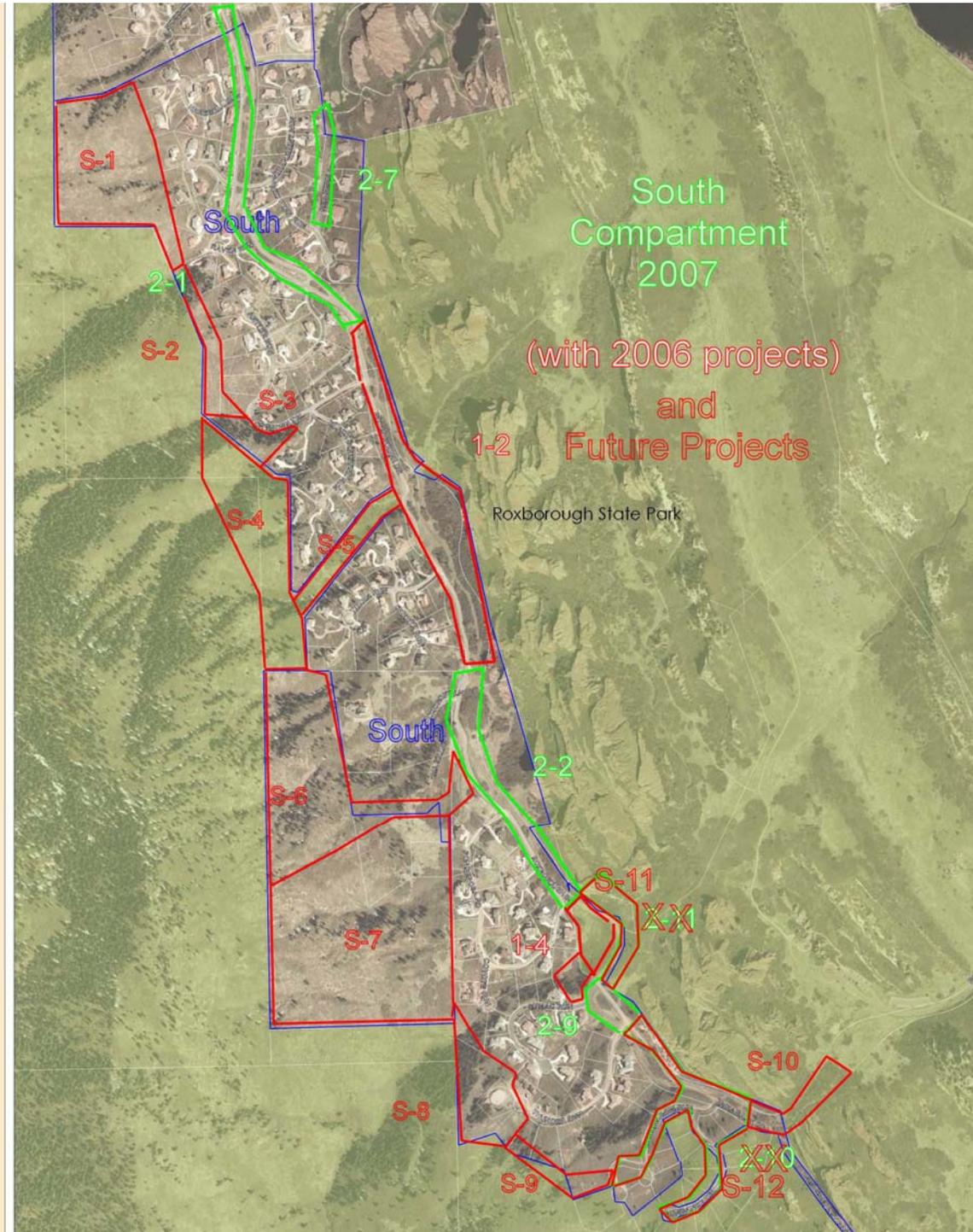


Figure 5. South Compartment (S)

Fuel Reduction Project Prioritization

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

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

Type of Mitigation Used for Projects

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

Vegetation Analysis

Current analysis of the density and varieties of vegetation is an integral part of deciding when to schedule projects. The aerial digital map below depicts the vegetation in Roxborough Park and its surrounding wildland urban interface from a 2004 photo flyover. Due to its age, it needs to be updated with the latest flyover information prior to final scheduling of a mitigation project. Vegetation mapping has been kept simple and follows established Colorado State Forest Service Fuel Mapping categories. These will be augmented by USDA Forest Service **National Fire Danger Rating System (NFDRS) designations** (General Technical Report INT-39).

The classifications used here are as follows:

- O- Low hazard or non-flammable areas. This includes bodies of water, road surfaces, well mowed greenbelts and golf course areas.
- X- Heavy Gambel oak (a.k.a. scrub oak, oak brush), mountain mahogany and other shrub species mixes. This fuel type is dominant in the West and South Compartments. (NFDRS Fuel Model B if untreated. Fuel Model F if treated.)
- A- Light fuels like natural prairie grasses with a mix of rabbit brush. This type predominates in the North Compartment. (NFDRS Fuel Model L. Areas with more than 1/3rd rabbit brushed cover should be Fuel Model T.)
- B- Medium fuels like those found along the golf course emergency access such as willows and other shrub mixes. 2006 Treatment Project 1-3, west of Haney Park, is considered Class B. (NFDRS Fuel Model E after leaf drop and Fuel Model R after trees have leafed out.)
- C- Heavy conifer tree areas found in pockets in the West and South Compartment. These tend to be predominantly Douglas-fir growing on north facing slopes. (NFDRS Fuel Model G if untreated. Treated stands, thinned and ladder fuels removed, could be considered as Fuel Model H.)

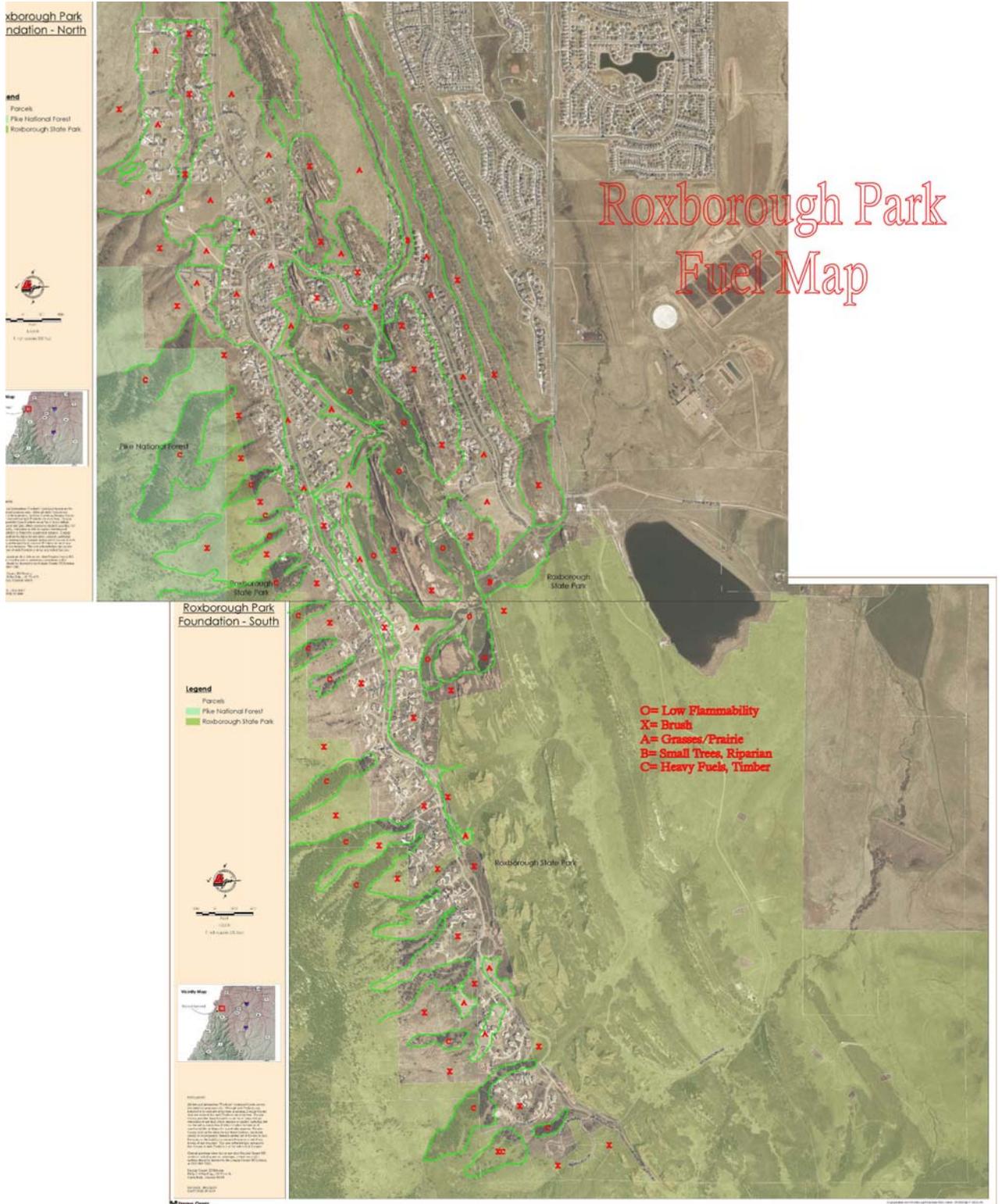


Figure 6. Fuel Mapping

Scheduling

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

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

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

Emergency Egress

Roxborough Park was originally designed in the 1970's to have multiple egress points. The bankruptcy of the original developer and disposal of properties to other entities eliminated these routes as options that would have occurred during the phased development of Roxborough. The Primary looped extension of Roxborough Drive through South Downs to Rampart Range Road is now within lands central to Roxborough State Park.

Multiple ingress and egress points are critical to public safety. Egress is needed for residents to evacuate and ingress required for emergency services. This is stressed in the Douglas County Land Development Codes (DCLDC) and Douglas County Comprehensive Master Plan 2020 (DCCMP). Specific references to "emergency service access" can be found in **Policy 4-10B.5** and **Policy 4-10B-17** of the DCCMP.

The need for multiple egress points in insuring adequate and timely evacuations has been shown in research studies by Professor Thomas Cova at the University of Utah. His team's research has shown that a minimum of four egress points are needed for a community the size of Roxborough (*Public Safety in the Urban-Wildland Interface: Should Fire-prone Communities Have a Maximum Occupancy?* Thomas J. Cova, Natural Hazards Review, August, 2005). At present, only two actual egress points exist from Roxborough – Roxborough Drive and Roxborough Drive North via the EEE (Emergency Egress Easement) to Ravenna (see **Figure 1**). A third egress point at the north end of Fox Paw Trail to Ravenna is planned for 2007. An emergency road across Arrowhead Golf Course exists to facilitate egress from the West Compartment via Haney Park to the main entrance. It is also important to note that "bottlenecks" will occur within the community if all traffic is directed to only one entrance.

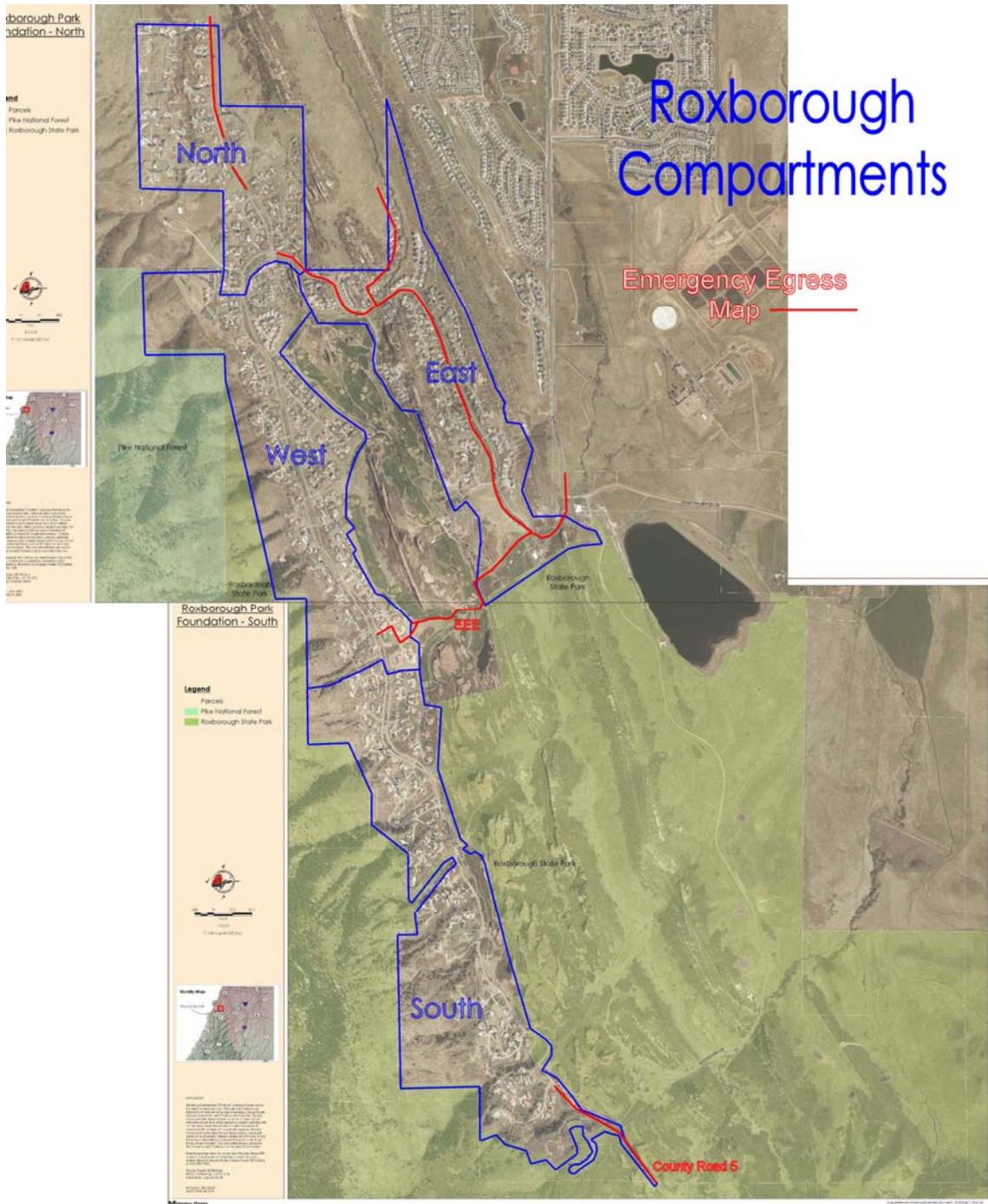


Figure 1. Roxborough Compartments with Emergency Egress Routes

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 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 South Compartment of the community is at greatest risk of entrapment. It can be expected that residents in the West Compartment will utilize either Roxborough Drive or the existing emergency road across the golf course. Residents in the South Compartment have only one connection point on Roxborough Drive and that will be at risk of blockage by others. The South Compartment is also within the heaviest fuel component of the community.

Douglas County Public Works has been actively investigating alternate egress routes from the South Compartment of Roxborough. At present, efforts have concentrated on the extension of DC Road 5 through Roxborough State Park and private property to Indian Creek Subdivision with a connection to State Highway 67 (see **Figure 2**). During the CWPP process, this route (established in 2001) was analyzed by the committee and its consultant, and determined not to be the best route due to its length and proximity to heavy fuel loading along its route. In addition, while a portion of the route across Roxborough State Park was improved, the egress was not completed due to an inability of the county and the owners of the private property to completely come to terms.

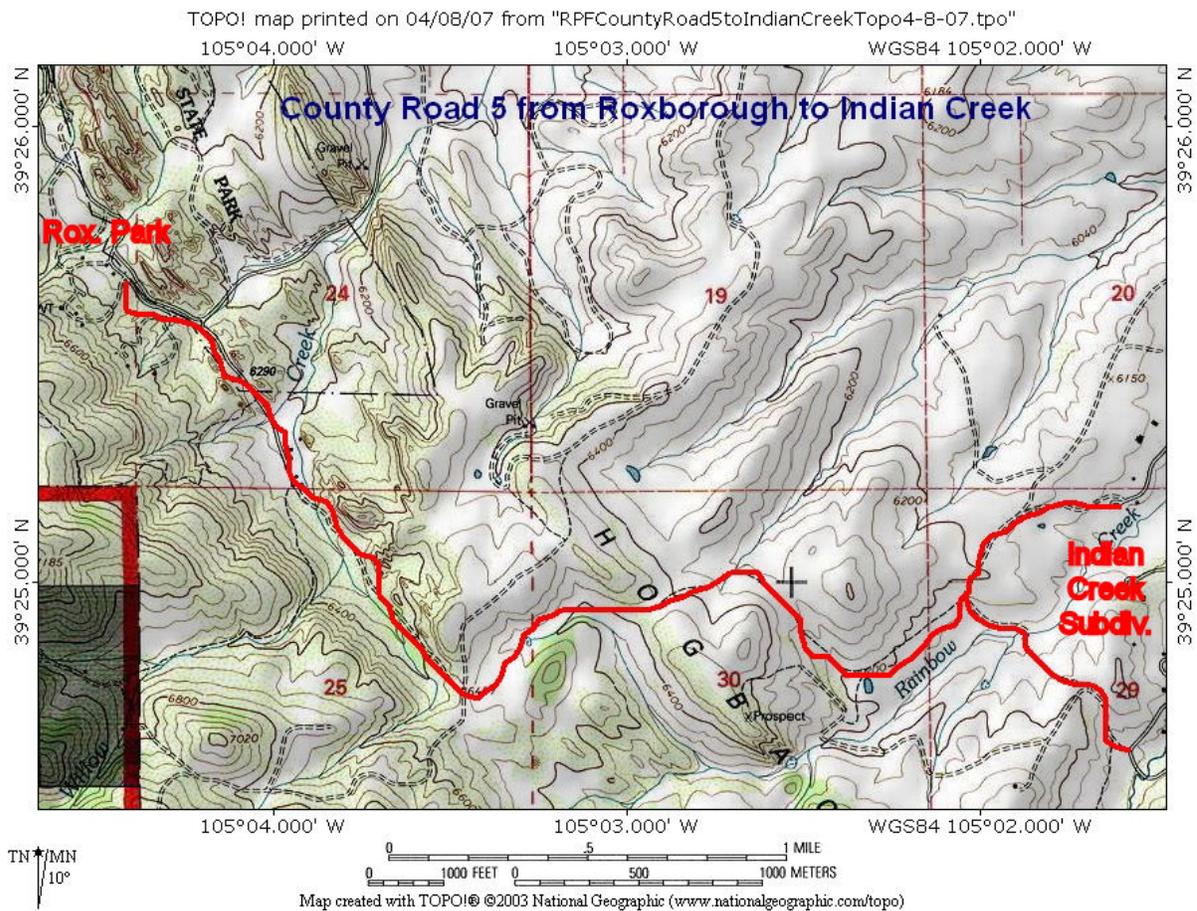


Figure 2. EEE (2001) to Indian Creek

However, at a recent meeting (April, 2007) with Douglas County Commissioners, DC Public Works, DC Emergency Management, Colorado State Parks, West Metro Fire Rescue, and

Roxborough Park Foundation, the above route and alternatives were discussed at length. As a result, the county is renewing discussion of the completion of the route with the private property owners. At the same time, Colorado State Parks is investigating alternatives for use of outlying areas of Roxborough State Park, in the event discussions with the private property owners should stall. State Parks also agreed to pursue fuel treatment along the route.

The Fire Mitigation Committee recognizes the varied political sensitivities of this route, as well as the alternatives. Therefore, the Committee recommends the following course of action:

1. Continue discussions with Douglas County regarding the previous (2001) EEE and its blockage due to the segment across private property.
2. Continue discussions with Colorado State Parks concerning other routes through Roxborough State Park
3. Advocate with all parties for acceptance of an emergency egress easement (EEE) width and surface that may differ from current County Regulations, while meeting the intent of the DCCMP.
4. Keep the “communication lines” open with public interest groups, e.g., The Friends of Roxborough State Park, regarding alternatives for placement of the route and physical specifications in order to minimize impacts to the Park.

Costs will be an important factor in any decision. Douglas County needs to address the issues of 1) the completion of the proposed route, and, 2) the maintenance of it. Roxborough Park Foundation, supported by the Fire Mitigation and the CWPP process, will continue to bring all parties to the table to facilitate securing the route and insuring its completion and long-term maintenance.

SERVICES, INFRASTRUCTURES, WILDLAND FIRE REPONSES

This section of Roxborough Park's Community Wildfire Protection Plan details professional and voluntary resources available to respond to emergencies associated with wildland fires impacting Roxborough Park's residents and structures. Professional responders are always Roxborough Park's front line in addressing wildfire, rescue and medical emergencies. No trained Roxborough Park-based voluntary neighbor emergency notification and first aid groups are available

Professional Wildland Fire Response Services

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

Douglas County Emergency Management

Douglas County Sheriff's Office, under the *Douglas County Office of Emergency Management*, provides the umbrella incident management and agencies coordination structure to the response and recovery from a wildland fire event(s) endangering Roxborough Park. Every wildland fire emergency incident that occurs in Douglas County utilizes the *Incident Command System (ICS)* during response and recovery activities, employing multi-agency operational structures as set forth in the *Douglas County Incident Management Guidelines and Standards*. The *Incident Management Guidelines and Standards* can be found in total at:

<http://www.dcsheriff.net/MAIN/DOCS/PDF/imgs.pdf>

In the emergency event of a wildland fire, Douglas County operates under a mutual aid agreement for providing equipment and personnel assistance, if able and available, among its fire fighting agencies. The agreement encompasses, in addition to West Metro Fire Rescue, Larkspur Fire Protection District (FPD), South Metro Fire Rescue, County of Douglas, Franktown FPD, Jackson 105 FPD, City of Littleton, Mountain Communities FPD, Parker Fire Rescue, Castle Rock Fire Rescue, North Fork FPD and West Douglas FPD.

As resources begin to deplete and the situation is recognized to be one that could be disastrous, municipal and county officials will become involved. At that time, the Multi-Agency Coordination Group (MAC Group, reference: *Douglas County Incident Management Guidelines and Standards*) shall confer and determine what special provisions need to be made or what special action needs to be taken. At this point, the need for the Emergency Operations Center (EOC) will be considered. EOCs locations for Douglas County are pre-established by the *Incident Management Guidelines and Standards*. The locations, in order of the listed priority, may change if the facility is not adequate for the situation. The EOC locations are shown in the following table.

Emergency Operation Center Locations, Douglas County

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Douglas County Sheriff's Office
Robert A. Christensen Justice Center
4000 Justice Way
Castle Rock 2. Park Meadows Center
9350 Heritage Hills Circle
Littleton 3. Highland's Ranch Community Assoc.
48 West Springer Drive
Highlands Ranch | <ol style="list-style-type: none"> 4. Parker Police Department
19600 East Parkersquare Drive
Parker 5. Roxborough Park Metro District
6222 North Roxborough Park Road
Roxborough 6. Larkspur Fire Station 161
9375 South Spruce Mountain Road
Larkspur |
|--|---|

For wildland fire only, mutual aid from local government fire suppression resources can be requested through the Designated Dispatch Center from the on-scene Incident Commander. Requested fire suppression resources would be from entities within Douglas County or from Arapahoe, Elbert, Jefferson, Teller or El Paso counties. Out of county local government resources will be coordinated and placed by either the Colorado State Forest Service Fire Duty Officer and/or Douglas County Emergency Services. The Colorado State Forest Service must be contacted in order to implement the Emergency Fire Fund (EFF) along with assumption of incident management by CSFS personnel.

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

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

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

West Metro Fire Protection District (WMFPD)

Response

WMFPD maintains a fleet of five Type-6 brush engines and has eleven Type-1 engines (plus six Type-1 reserve engines). The majority of the Type-1 engines are equipped for minimal wildland fire operations. Five stations on the western and southern edge of the district are interface stations; each is equipped with a Type-6 engine and an interface equipped Type-1 engine. The majority of the Type-1 engines have foam capability. Engine No. 9 is equipped with a Compressed Air Foam System (CAFS). WMFPD Station 9 is the wildland fire station (Map 3). The captain assigned to this station is the wildland fire coordinator. All spare equipment is housed here.

Type-6 engines are not staffed. When the unit is dispatched, the engine crew will detach a driver and respond with the engine (called a brush company). During heavy use or large incidents, the Type-6 engine may be staffed on an overtime basis.

The standard response is a single engine during low fire danger, and is increased during red flag conditions to include a brush company and an additional Type-1 engine (at the district chief's discretion). Additional wildland fire alarms include an additional Type-1 engine, a Type-6 engine, and a medic unit. When structures are involved, a full structure response will be sent which includes:

- Two Type-1 engines
- One medic unit
- One district chief
- One tower
- One heavy rescue
- One Rapid Intervention Team (RIT)
- Safety and Medical Officer

WMFPD maintains a wildland team of 48 members with a variety of certifications and it is used to staff deployment engines. WMFPD has a Type-1 engine and a Type-6 engine available for national deployment.

Mutual Aid

The district participates in the Jefferson County Resource Groups. These groups are pre-organized task forces used for structure protection or a squad for a hand crew. All Incident Commanders (IC) and District Chiefs are authorized to request Mutual Aid from any agency. WMFPD may respond to mutual aid requests from other agencies if no or limited incidents are occurring within the district. WMFPD participates in the C-470 Wildland Task Force along with South Metro, Parker, and Littleton. When needed, these departments jointly stage resources at WMFPD Station 9/15 and deploy as a unified force.

Wildfire Suppression Capability

Currently, all wildfires within WMFPD are aggressively suppressed regardless of cause. The closest station is usually the responding force. A mutual aid agreement exists among all Jefferson County fire departments to provide appropriate response as needed. The responding fire station determines the need for mutual aid upon initial attack and may request additional aid from other WMFPD stations or from other Jefferson County FPDs. The County is a partner with CSFS relative to wildfire suppression and management and would request their aid if conditions warrant. The USFS would also partner if wildfire threatened federal land.

WMFPD responds to three types of wildfire emergencies: fires within the urban/interface, fires mixed within the urban areas, and fires on public or private lands out of reach of structures. Fires such as structure, vehicle, or grass/weed/trash within the urban area are outside the scope of this CWPP. These areas are generally surrounded by roads or homes and can be suppressed using the district's non-wildland fire resources. The FPD's resources are adequate for the vast majority of these incidents and will not be discussed within this plan.

Access by emergency vehicles is generally good within the majority of the assessment area with the exception of the western boundary. The fuels in the assessment area include oak brush in Waterton Canyon and a mixture of grasses and oak/mountain mahogany brush elsewhere. WMFPD is in need of hand crews to suppress fires within these areas.

Table 1 shows "Line Production Rates for Initial Action by Engine Crews" and the "Acreage Determination Factors" charts in the National Wildfire Coordinating Group (NWCG) Fireline Handbook. Other mitigating factors that could affect these estimates are if the crews need to construct sustained lines, burnout or holding operations. These are the rates for estimating initial action productivity only. But this does provide a good estimate of the wildland fire capability of the district.

Table 1. Wildland Fire Production Rates

Wildland Fire Production Rates Per Hour Using Type-6 Engine (3 firefighters)			
Anderson Fire Behavior Fuel Model	Chains	Acreage	Firefighter Capability (acres)¹
Grass	24	2	10
Short grass with scattered shrubs or open timber	15	1	5
Tall grass over 3 ft tall	10	0.5	2.5
Shrubs under 6 ft. tall – Brush	12	0.75	4.25
Closed timber litter	15	1	5
Closed timber with heavy dead and down woody debris	12	0.5	2.5
Wildland Fire Production Rates Per Hour Using Type-6 Engine (4 firefighters)			
Grass	35	4	20
Short grass with scattered shrubs or open timber	21	2	10
Tall grass over 3 ft tall	14	1	5
Shrubs over 6 ft. tall – Oak Brush/Mtn. Mahogany	15	1	5
Shrubs under 6 ft. tall – Brush	16	1	5
Closed timber litter	20	2	10
Closed timber with heavy dead and down woody debris	16	1	5
Brush	16	1	5
Oak Brush/Mtn. Mahogany	6	0.5	2.5

¹ Based on five Type-6 engines; capacity of companies 4, 9, and 13 of 3 firefighters; capacity of companies 11 and 15 of 4 firefighters.

The structure protection table (Table 2) is based on the time a crew can prepare a structure for a wildland fire using a Type-1 engine. The accepted standard is 20 minutes for a four-firefighter crew and 30 minutes for a three-firefighter crew. The district's ability to prepare a structure is based on only using the interface stations. Other engines can be called upon, but do not have the training or the equipment.

Table 2. Structural Protection Rates

Structural Protection Rates Per Hour Using Type-1 Engines			
Stations	Firefighters	Rates	Total per hour
4, 9, & 13	3	30 minutes/structure	6
11 & 15	4	20 minutes/structure	6
Total			12

WMFPD can increase Structural Production Rates by 50% by the addition of a single firefighter to an engine.

All firefighters have received NWCG S-130/190 training. Only wildland fire team members have the yearly safety class and have maintained the arduous conditioning required for re-certification. Seventeen team members have advanced wildland fire training as NWCG qualified Squad Boss or higher certification.

WMFPD has many areas where engines will not be able to respond. These areas are in Waterton Canyon and areas along the foothills on the western edge of the assessment area. The district will then need to dismount the crews from the engines or call in off duty wildland team members to establish a handcrew.

Recommendations

Wildland Fire Attack - Correlating BehavePlus Predictions of Fire Behavior and Wildland Fire Production Rates the district should be able to suppress fires with the rate of spread in average conditions. Mobile attack production rates using all of WMFPD type 6 engines should match or exceed Rate of Spread during average conditions. But WMFPD will not be able to suppress the majority of the incidents during Severe Conditions Rate of Spread if the fires move past initial attack. Initial Attack becomes critical to stopping these fires prior to developing into fires the district will not be able to manage. Factors that influence initial attack capability are 1) adequate staffing, 2) equipment and 3) training.

Adequate Staffing - The district responds with 5 type 6 engines that are staffed with crews from the type 1 engine assigned to the interface station. This response is adequate for the majority of incidents.

During high fire danger or during multiple incidents this staffing may not be adequate. The crews assigned to the interface stations may not be members of the wildland team and these non-wildland team crews are not adequately trained to NWCG standards. Assembling trained crews from on duty forces or bring in off duty personnel is a slow process that may close the initial attack window. The district should develop a staffing procedure for high fire danger to include a process for determining fire danger (National Fire Danger Rating System [NFDRS]).

Equipment: Water Tender - WMFPD currently relies on a mutual aid agreement with neighboring FPDs to provide water tenders when needed. WMFPD should evaluate the need and consider obtaining at least one tender such as a 2,000 gallon type 3 tactical water tender. The tender could be garaged at WMFPD Station 11.

Training – Training should be based on response standards. These standards provide a focal point to move the program forward. The following response standards should be considered:

Initial Attack

The following events should occur when WMFPD receives a smoke report for non WUI fires:

- WMFPD will complete a size-up and have the wildfire scouted by basic wildland qualified personnel 30 minutes from the initial smoke report.
- WMFPD will have a full-red card certified, 20-person hand crew, with a crew boss, two squad bosses at staging within 30 minutes of the smoke report. A “red card” is a certification program sponsored by NWCG.
- WMFPD will have a hand crew on the fire line within one hour of the original smoke report. WMFPD has the capability to form its own red-carded hand crew but under low turnout periods the crew can be filled out using the other outside hand crew teams.

- WMFPD will be able to supply 30 gallons per minute from at least two 1 ½" lines within 90% of the district boundaries and within 2500 feet of access of apparatus within the wild areas on the western portion of the District.
- WMFPD will be able to perform a mobile attack using four type 6 engines with one engine in reserve (tandem attack) on each flank of the fire. These four engines should be able to suppress fires in average Rate of Spread (see table 6 BehavePlus Predictions of Fire Behavior) in fuel models 1 (short grass); 2 (short grass with scattered shrubs or open timber); and 3 (tall grass over 3 ft. tall) at the minimum production rate Fuel Model 1 – 96 chains per hour; Fuel Model 2 – 41 chains per hour; and Fuel Model 3 – 119 chains per hour.
- WMFPD will have qualified personnel predict fire behavior using weather information, fuel loading, and fire danger ratings and communicate the prediction to operations/planning within 30 minutes of the smoke report.
- WMFPD will be able to activate air support within 30 minutes of the smoke report.
- WMFPD shall have the capability for sustained operations when the fire moves into extended attack operations. The District will be able to maintain Incident Management until relieved by the Jefferson County IMT Type III. The District will be able to maintain a single 20-person hand crew for the duration of the incident.

The following events should occur when a smoke report is received for WUI incidents:

- WMFPD will complete a size-up and have the wildfire scouted by basic wildland qualified personnel ten minutes from the initial smoke report.
- WMFPD will have a full-red card¹ certified, wildland task force, with a task force leader, at staging within 20 minutes of the smoke report. This task force shall include two type one engines, two wildland water tenders, two type six engines and 20 personnel.
- WMFPD will be able to prepare a single structure for structural protection every 20 minutes.
- WMFPD will be able to protect four structures with each task force and suppress two spot fires within 20 minutes. This includes having two 1 ½" lines surrounding the structure, placement of a wet line, firing out for a distance to safely protect the structure without direct intervention by the engine crews, and preparing the structure for the fire front.
- WMFPD will use direct fire attack whenever possible to stop the fire prior to the need to perform indirect structural protection.
- WMFPD will have qualified personnel predict fire behavior using weather information, fuel loading, and fire danger ratings and communicate the prediction to operations/planning within 20 minutes of the smoke report.
- WMFPD will be able to activate air support within 10 minutes of the smoke report.

Extended Attack

WMFPD has the capability for sustained operations when the fire moves into extended attack operations. WMFPD will be able to maintain an Incident Management Team Type (IMT) IV organization until relieved by the Jefferson County IMT Type III. WMFPD will be able to maintain a single 20-person wildland task force for the duration of the incident.

Emergency Medical Services

WMFR provides first response emergency medical services to Roxborough Park. Medical response is included in the District Standard Operating Procedures in Appendix E.

Water Resources

Water and sewer service is provided by the Roxborough Water and Sanitation District. For direct suppression and wildfire defensive use within the "built" areas of Roxborough Park, 132 hydrants are located throughout the community. These are supplied by a 1.0 mgal. Tank located at 10188 Thunder Run. Under widespread wildfire conditions, hydrant pressures will obviously vary. Under non-emergency conditions, water pressure averages are:

South- 88 psi
 West- 86 psi
 North- 98 psi
 East- 101 psi

Portions of the water system are looped. However, a number of dead-end lines exist. The Zone 4 tank serves all of Roxborough Park and the West Metro Fire Station 15. The one million gallon tank (86' X 24') is typically maintained at a 13' minimum water level during the wildfire season. The average re-charge time is one foot (1') per hour depending on system demands. The system is backed up by power generators at each of its water treatment plants. Pump station back-up generators are planned for installation in 2008.

Secondary water supplies exist in lakes at the Foothills Water Treatment Plant, Aurora Rampart Reservoir on N. Roxborough Road, and in Chatfield Reservoir. Several smaller bodies of water are located within the Arrowhead Golf Course property. The golf course water features are typically kept full. It is strongly recommended that a "pre-use agreement" be negotiated during the first year of the CWPP, and be in place by the end of 2007.

Temporary Refuge Zones/Staging Areas

During emergency situations, it may be necessary for residents and emergency services providers to reach a safe place that is not outside of the community. West Metro Fire Rescue, in conjunction with other wildfire authorities, recommended establishment of Temporary Refuge Zones within the community. These can be used as reasonably safe areas where little or no wildfire risk exists in close proximity to either natural (vegetation) or man-made (homes) fuels. These may serve two purposes. The first is as a refuge from any wildfire threat. The second is as staging areas to allow timely and orderly evacuation of residents. It should be noted that many of the civilian fatalities from wildfires are caused during evacuations in which residents become trapped and overrun by fire. Once residents are evacuated, these refuge zones may be used by firefighters as staging areas for marshalling resources within the community. These are shown on maps found in **Appendix B**.

For these to be effective, signage/posting will be needed. An annual educational campaign should be established. Posting on the RPF web site will be essential. Entry gate houses and mail kiosks can also be used as posting places.

Two golf courses are in and around the community (Arrowhead and Ravenna). These can be excellent refuge zones if made accessible. A number of internal roads currently connect to

the Arrowhead course. Any RPF greenbelts that connect to Arrowhead should be well maintained and fire risks lowered. The Ravena golf course is currently under construction. Once on-line, it will provide a good refuge for residents in the North Compartment (see **Compartment Plan**) of the community. Residents in the East and West Compartments can utilize current access points to the Arrowhead course. Several smaller refuge zones have been identified and are shown on the **Refuge Zone Map (Appendix B)**.

The south quadrant does not have adequate refuge or staging zones. The presence of heavy fuels along all egress routes and absence of large natural openings places this portion of the community at greater risk of being entrapped. Aggressive fuel treatments will be required to reduce risks of entrapment. Smaller refuge/staging zones in this compartment will be addressed in the schedule of fuel treatments.

A number of staging areas for emergency services personnel have been established. The first is WMFR Station 15. It is located off the main thoroughfare and connects to the Roxborough State Park access road. Other staging areas are: 1) RPF Maintenance Yard; 2) Haney Park; 3) Arrowhead Golf Course Club House and parking areas; 4) Rain Dance Trail (at golf course connection); and 5) Pine Park (neighborhood park east side of Roxborough Drive).

Internal Volunteer (Roxborough Park Residents) Services and Communications

Roxborough Park Foundation currently supports a number of volunteer and paid groups that can be used in communication support or augmentation of professional first-responders within Roxborough Park in the event of a wildfire emergency. The most important is the RPF board of directors and the RPF Community Manager. It is strongly recommended the RPF Board implement operating agreements with West Metro Fire Rescue that allow for use of RPF properties and facilities during emergency situations. A sample agreement is included in **Appendix C**.

The most frustrating issue for residents during wildfire events is a lack of information. Local media cannot always be relied on for timely and accurate information. Residents may be away from the community at the outbreak of an emergency and require information necessary to protect family members and pets still at home. Possible information sources are the RPF (www.roxborough-park.com) and the West Metro Fire (www.westmetrofire.org) web sites. The Douglas County Sheriff's Office (DCSO) may also have an emergency phone line set up to provide information.

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

Roxborough Park Security Guards (Gate Attendants)

The entry gate to Roxborough Park should be utilized as an information distribution point for residents entering and leaving the community. Staff can be used to inform residents and visitors of wildfire or prescribed fire events in the surrounding area. Existing controlled entry locations can also be used by Douglas County Sheriff's Office personnel (deputies) as Staging areas for coordinating evacuations or controlling access to the community.

RPF Maintenance Staff

During periods of extreme fire danger (red flag days), the maintenance department could be used for information distribution or as back up to gate attendants. The RPF board may want to consider Traffic Control Training and purchase of appropriate personal protective equipment (PPE) for all full-time maintenance staff.

Egress and Ingress Routes / Evacuation

At present, Roxborough Park has only one route for full-time vehicular egress and ingress to the community. Under this present road environment, an emergency event requiring both evacuation of Roxborough Park and potential simultaneous entrance into Roxborough Park for emergency response vehicles will pose significant safety and operational issues. All officially ordered emergency event evacuation of Roxborough Park residents will be directed and managed by *Douglas County Law Enforcement*.

Currently, under the auspices of the *Douglas County Board of County Commissioners*, alternatives for a secondary access route (as required by NFPA regulation 1144 and Douglas County *Comprehensive Master Plan 10B-18*) are being studied by Douglas County Public Works, and the RPF Fire Mitigation Committee.

One emergency egress route is currently planned at the north end of Roxborough Drive North into the adjacent Ravenna development. A second emergency access connection is planned for Fox Paw in the East Compartment. Douglas County is currently studying upgrades to the old County Road 5 at the south end of the community. An alternate emergency route was recently proposed to connect to the Roxborough State Park access road by utilizing the old road bed from County Road 5 to the State Park visitor parking area. This alternative is still in review. At this point, it may be the only safe route for evacuation of the South Compartment and access point for emergency services.

One internal emergency access exists across the golf course. It begins at Rain Dance Trail (off Moss Rock) and connects to the Haney Park access road.

Appropriate signage needs to be installed directing residents to these routes. An annual educational campaign will also be required to insure timely knowledge of any egress routes. Ideally, drills should be conducted each year as well.

Street Signage and Sight Distances

Currently, street signage within the community is inadequate and should be updated to current standards. All signs should be metal, with metal posts, and conform with the Manual of Uniform Traffic Control Devices (MUTCD) with regard to letter sizing and reflective materials.

Adequate signage will be important for out-of-jurisdiction firefighting resources that may respond to the community's aid. Good signage will also be important for residents who may be required to access parts of the community they do not normally access.

Sight distances at all intersections and median crossings should provide an unobstructed 25 feet sight distance triangle. Blind intersections and median crossings will pose a threat of accidents at critical bottle-necks along major egress routes during an emergency. During wildfire conditions, this can be compounded by heavy smoke and panicked residents. This will be addressed as part of fuel treatments along major thoroughfares.

Critical Utilities

In the event of a wildland fire that would impact Roxborough Park, WMFR or DCEM Incident Command dispatcher would notify critical utilities for their support. Specifically, emergency involvement of utility support would focus on two areas: 1) Safety of the public and emergency response personnel and 2) Direct support of mitigating the emergency event.

Public and Emergency Response Personnel Safety

Beyond the direct emergency event, 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 done by:

Natural Gas Services: *Excel*
Emergency Service Telephone Number: (303) 623-1234

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

Direct Support

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

Water: *Roxborough Water and Sanitation District*
Office: 303-979-7286
Emergency Service Telephone Number: (303) 752-7267

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

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

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

Post-Fire Remediation

In the event a large wildland fire should burn significant acres above the community, RPF will need to immediately reclaim or stabilize areas above homes. Burned areas will be prone to mud slides, debris flows or rock fall hazards. These can have an impact on surviving residences and the RPF road network. The denuding 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 Foundation should be prepared to:

1. Immediately retain the services of an engineer or geologist to assess potential storm and debris flows after a wildfire of significant size.
2. Establish a stand-by contractor list of licensed and insured heavy equipment operators for clearing of roads, cleaning of culverts and construction of potential diversions or road repairs.
3. Hire a reclamation contractor to stabilize areas above homes and RPF infrastructure with a combination of temporary and permanent erosion control measures.
4. Contact Natural Resources Conservation Service (NRCS) for possible Emergency Watershed Protection (EWP) funds for assistance with emergency stabilization.

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

PUBLIC NOTIFICATION, COMMUNICATION AND SUPPORT

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

Warnings and Hazard Notification to the General Public

Warning notifications concerning a specific wildfire or wildfires directly threatening the Roxborough Park area can be authorized only by the West Metro Fire Protection District Chief, Douglas County On-call Emergency Management Coordinator or the Douglas County Sheriff. Such a warning can be issued in a variety or combination of methods and will generally contain *action* information for residents. An *action* information or direction may contain preparatory information for residents concerning potential, upcoming evacuation of the Roxborough Park area or may be an immediate, “*act now*” request for evacuation due to a wildfire condition that is deemed to have imminent impact to the Roxborough Park area. Authorization, *official* warnings may come from:

- 1) Emergency Preparedness Network (AKA: Reverse 911)*
- 2) 850 AM radio, KOA*

Services Communications and Support Systems

Non-threatening Conditions

Informational notification of Roxborough Park residents are done for public meetings, events and general services conduct or schedule information. Several mediums are used for general public informational notifications including Roxborough Park Foundation Public Board notice meeting at Mail Kiosks, general letter mailing, flyer posting and mailings, Roxborough Park website posting on <http://www.roxborough-park.com> and the Echoes monthly newspaper.

Wildfire Condition

In the event of an actual wildfire impacting Roxborough Park, updated residential wildfire event information should be posted periodically on the RPF website (<http://www.roxborough-park.com>.) Updated information is generally available on messages recorded and made available on event-established, dial-up telephone line(s) by the Douglas County Sheriff’s Office. The telephone number(s) of phone line(s) for such use are specific event established, with the numbers announced to the public via printed or announced on public broadcast mediums. Periodic updates regarding emergency events are also generally broadcasted via 850 AM KOA radio, the official emergency public broadcasted radio station for Douglas County.

IMPLEMENTATION PLAN

Chapter 8 provides a summary of actions of Roxborough Park's Community Wildfire Protection Plan. These actions are designed to address four broad subject areas to enhance residents' safety and diminish wildfire potential in Roxborough Park and its adjacent environs as identified in Chapter 4, *Wildfire Hazard Assessment*. First, 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. Secondly, 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 Roxborough Park Foundation and adjacent State Park and United States Forest Service owned lands. The general periods identified for developing fuel breaks in these high wildfire risk areas is to be based upon both risk potential and funding availability. The priorities associated with these wildfire risk mitigation areas can be found in Chapter 4, *Wildfire Hazard Assessment*, and Appendix A, *CWPP Treatment Areas*. The third area addressed by this implementation plan is the communication, support and information services used to provide added knowledge and information to be used in planning for wildfires as well fighting them in the event one or more should occur in the Roxborough Park. The final broad focus area, Mitigated Areas Perpetuation, addresses maintaining fuel mitigated areas once the areas have had wildfire fuels initially reduced as well as on-going RPF administrative actions associated with the Community Wildfire Protection Plan.

Public Education

The Roxborough Park 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*," Roxborough Park may experience up to 10% change to its profile of residents during the year. Many of these "*new*" residents of Roxborough Park 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 Roxborough Park 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 Roxborough Park's residential general public and the availability of qualified instructors or presenters. The public education topical areas include but are not limited to:
 - Structural construction materials or design considerations
 - Home safety and home fire warning and fire suppression equipment
 - Home risk self-assessment and structural wildfire risk reduction
 - Residential fuel reduction strategies
 - Landscaping for wildfire protection; xeriscaping
 - Living adjacent to wildlands
 - Home property fuel mitigation strategies and methods
- Public Education programs will use professionally developed instruction collateral material developed from resources recognized for their experience and expertise including,
 - National Firewise Communities USA
 - American Planning Association
 - United States Forest Service
 - Colorado State Forest Service

- Colorado State University Cooperative Extension
 - West Metro Fire Protection District
 - Douglas County
 - Private Consultants
- Upon publication of the 2006 Community Wildfire Protection Plan for Roxborough Park, the Fire Mitigation Committee will develop an annual schedule that is published and periodically recapped in the Echoes Newsletter. Also, see Appendix K, *Firewise Household Tips, Property Mitigation and Protection*.

Although several public meetings have been held to inform and/or assess the opinions of the general public on *Firewise* and wildfire issues, the 2006 baseline for this implementation plan area is being considered zero. Annual performance assessment of public training will be based upon the public education training and informative session attendance as well as comments and reactions from the general public. For overall impact against the wildfire protection plan program, training session attendance should be totaled annually and expressed as a percentage of Roxborough Park total residents. This percentage should be trended year after year for evaluation and public education course management purposes.

Fuels Treatment

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

Road Rights of Way and Safety Zones

Fuel treatments provide quick, safe access for wildfire defensive positions and wildfire suppression if minimum width standards have been applied; as such, they are necessarily linked with roads systems. Where possible, potential fuel treatments proposed in this Plan have been connected with RPF-specified roads and time-established trails within Roxborough Park's less developed areas. The potential fuel treatments will provide good access and defensive positions for firefighting equipment and support vehicles. However, efforts must continue to expand treatments to CSFS standards for adequate fuelbreaks (See Appendix J, Fuelbreak Guidelines for Forest Subdivisions). In addition to creating defensive gaps of potential wildfire fuel and affording good access, potential fuel treatments are proposed in this plan to create "*compartments*" within Roxborough Park that break up large tracts of dense fuel, thus limiting uncontrolled spread of wildfire. The planned fuel treatments and the "*compartments*" they enclose can be seen on the individual quadrant maps, Chapter 4, *Hazard Assessment*.

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

Implementation Actions

- Mitigate existing and proposed road areas within the right of way associated with the road. Generally, in all established and planned roads within Roxborough Park, this action creates a fuelbreak 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 200 feet

or greater, depending on fuel density and terrain slope, this Community Wildfire Protection Plan initially establishes a break of 60 feet since such can be addressed quickly within the road right of way, followed later by working with adjacent landowners to encourage widening the fuelbreak by encouraging “feathering” of the fuelbreak into their private land. The RPF Board will:

- Work with West Metro Fire Protection District, Arrowhead Golf Course, Douglas County Public Works, CSFS, Douglas County Building Department and Douglas County Office of Emergency Management to assess and cooperate on joint fuel mitigation projects;
- Review prioritization of fuel mitigation projects and schedule projects annually based upon funding and the identified risk priority of the projects;
- Take action to establish a separate budgeting category (2006 and yearly beyond) to identify “direct” budgeted dollars to be directed at road right of way mitigation projects and mitigation projects associated with established and recognized trails and lands within RPF Board properties;
- Detail and file for particular Federal grants awarded annually for fuel mitigation and wildland fire protection support. Funding may be channeled through CSU/CSFS as “sub-awards”;
- Develop and update annually, a long-range (five to twelve year) schedule of wildfire fuel mitigation projects and post the schedule on the RPF’s website for public access.

Roxborough Park Foundation Properties

The Foundation has the opportunity to use its properties to demonstrate good property management and ecosystem restoration. Greenbelt areas away from main roadways and safety zones can either help or hinder individual homeowner actions. Where possible, RPF 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 small lot sizes, terrain, or absentee ownerships. On-going maintenance by outside contractors or in-house staff will be important to provide risk reduction for adjacent home sites.

Implementation Actions

The Wildfire Committee and Design Review Committee will need to work closely to insure that treatment projects allow for some level of privacy protection currently provided by the over-grown and declining gambel oak plant community. Visual sensitivity will be important. The RFP Board will:

- Work with wildfire professionals to lay out treatment areas on RPF properties by advising the DRC of all activities. Coordination with adjacent property owners will be necessary.
- The same items noted under Fuel breaks and Safety Zones will apply.

Private Homeowner and Landowner Properties

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

Implementation Actions

- Roxborough Park Foundation and/or West Metro Fire Protection District will work with private property owners within the boundaries of Roxborough Park to support them in their mitigation efforts by:
 - Provide resource and education help as indicated in the “*Public Education*” actions, above;
 - Continue to track “*in kind*” private fuel mitigation work on private property;
 - Fund certain support projects; e.g., periodic *slash* removal;
 - Continue to fund the slash and yard waste disposal site;
 - Formalize Design Review processes and Design Guideline modifications that allow for implementation of Defensible Spaces. These shall utilize the services of West Metro fire fighters and professional foresters. Note: The recent passage of Colorado State Statutes (SB05-100) that must allow for homeowner defensible spaces shall be incorporated into any new guidelines. The Colorado Revised Statute is now C.R.S. 38-33.3-106.5.
 - Continue to encourage replacement of wood shake-shingle roofs by allowing as many materials as possible. Note: There is a prohibition on use of fiberglass composition roofing. Alternatives that maintain the aesthetic values currently established, while providing a “Class A” level of protection are critical.
 - Provide information distribution of wildfire planning or Firewise events or activity affecting the homeowner;
 - Provide volunteer notification and limited assistance of homeowners during an emergency event.

Undeveloped, Privately-owned Properties

With over eighty-five percent of Roxborough Park lots developed, areas of undeveloped land lie to the southern, eastern and western portion of the Park area (See Chapter 4, *Hazard Assessment* and Appendix A, *CWPP Treatment Areas*). These areas are heavily covered with dense, untreated brush and, in many situations, also present rough, dramatically sloping terrain. Consequently, these areas present huge fuel beds for wildfires and present Roxborough Park with its most significant ingress routes for wildfires. The undeveloped, and generally privately-owned, areas may require Roxborough Park to take more aggressive action on its properties in order to address fuel reduction.

Implementation Actions

- Roxborough Park Foundation and/or West Metro Fire Protection District will work with private property owners of undeveloped lands bordering Roxborough Park to discuss, assess, and plan potentially joint mitigation efforts. Concurrently, RPF will pursue collaboration with Douglas County agencies and Douglas County officials to assist and support efforts to reduce Roxborough Park wildfire exposure by addressing undeveloped areas. Such actions will include efforts to:
 - Assess timing of in-fill development in currently undeveloped areas and work with them, in conjunction with Douglas County, to effect guideline driven fuel mitigation on their targeted properties prior to structure construction;
 - Encourage and stimulate Douglas County authorities to effect changes in ordinances and statutes to require developers to mitigate the areas being developed prior to any construction;
 - Initiate further discussion with owners of small horse parcels (to the west), Roxborough State Park properties (to the southeast, south and southwest) and the United States Forest Service (with the Pike National forest to Roxborough Park’s west and northwest) to assess potential individual and joint wildfire mitigation efforts on common interest areas.

Communication, Support and Information Services

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

Implementation Actions

- Implementation actions are recommended to:
 - Notify public of wildfire preventive actions being taken by using the Echoes newsletter and RPF Website, distributed flyers, direct mailing, or combinations of the aforementioned media.
 - Recognize implemented projects in the Echoes and on the RPF website;
 - Identify, schedule and fund wildfire protection ancillary projects; e.g., Remote Automated Weather System (RAWS), improved communications, signage, etc.

Mitigated Areas Perpetuation

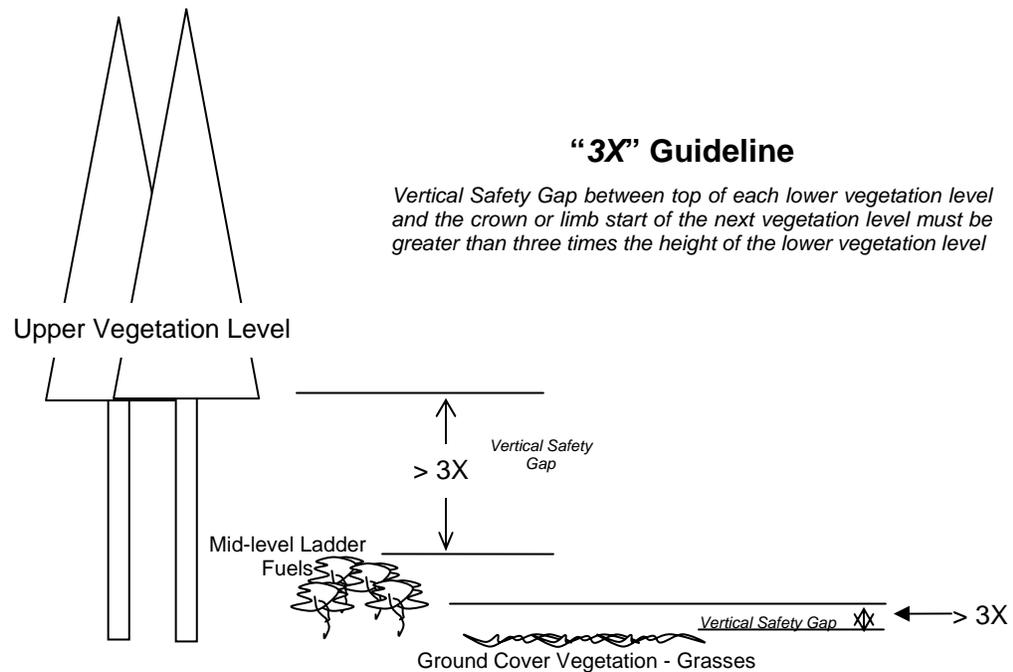
The focus of this broad section of the Implementation Plan is twofold: 1) to address the guidelines for assessing when to maintain fuel areas that have already had fuel reduction efforts applied and 2) to set forth a checklist of administrative actions that need to be followed by the RPF.

Implementation Actions

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

Previously Mitigated Property/Fuelbreak Maintenance “3X” Guideline

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



- The Roxborough Park Foundation Board will implement the following administrative actions:
 - Establish a separate RPF budget category, which denotes funds for CWPP planned actions (For ledgering and future financial analysis, sub-categories should underpin the category to track expenditures for RPF property, privately owned property RPF support functions and RPF work with undeveloped parcels of privately owned land);
 - Detail a chronological schedule for filing for Federal grants applicable to mitigation and Firewise work as these may become available;
 - Budget specific RPF funds for “*direct*” funded wildfire fuel mitigation on road/trail rights of way and RPF owned property;
 - Manage contact and begin discussion with private property owners adjacent to Roxborough Park for potential individual and joint wildfire mitigation efforts on common interest areas;
 - Fund quarterly wildfire prevention training for Roxborough Park based general public;
 - Assess timing of and maintain a schedule of land development action in currently undeveloped areas;
 - Support the Roxborough Park Fire Mitigation Committee recommendation to effect a second road for egress/ingress to Roxborough Park in accordance with Douglas County *Comprehensive Master Plan 10B-18*;
 - Schedule appropriate, periodic general public updates of CWPP planned work;
 - Continue to identify and schedule wildfire protection ancillary projects; e.g., Remote Automated Weather System (RAWS), improved emergency communications, emergency and wildfire protection signage, etc.
 - Establish and maintain baseline information for proposed areas of mitigation;
 - Evaluate planned CWPP projects for effectiveness and amend CWPP annually to keep plan and actions current and appropriate for changing environmental and development conditions.



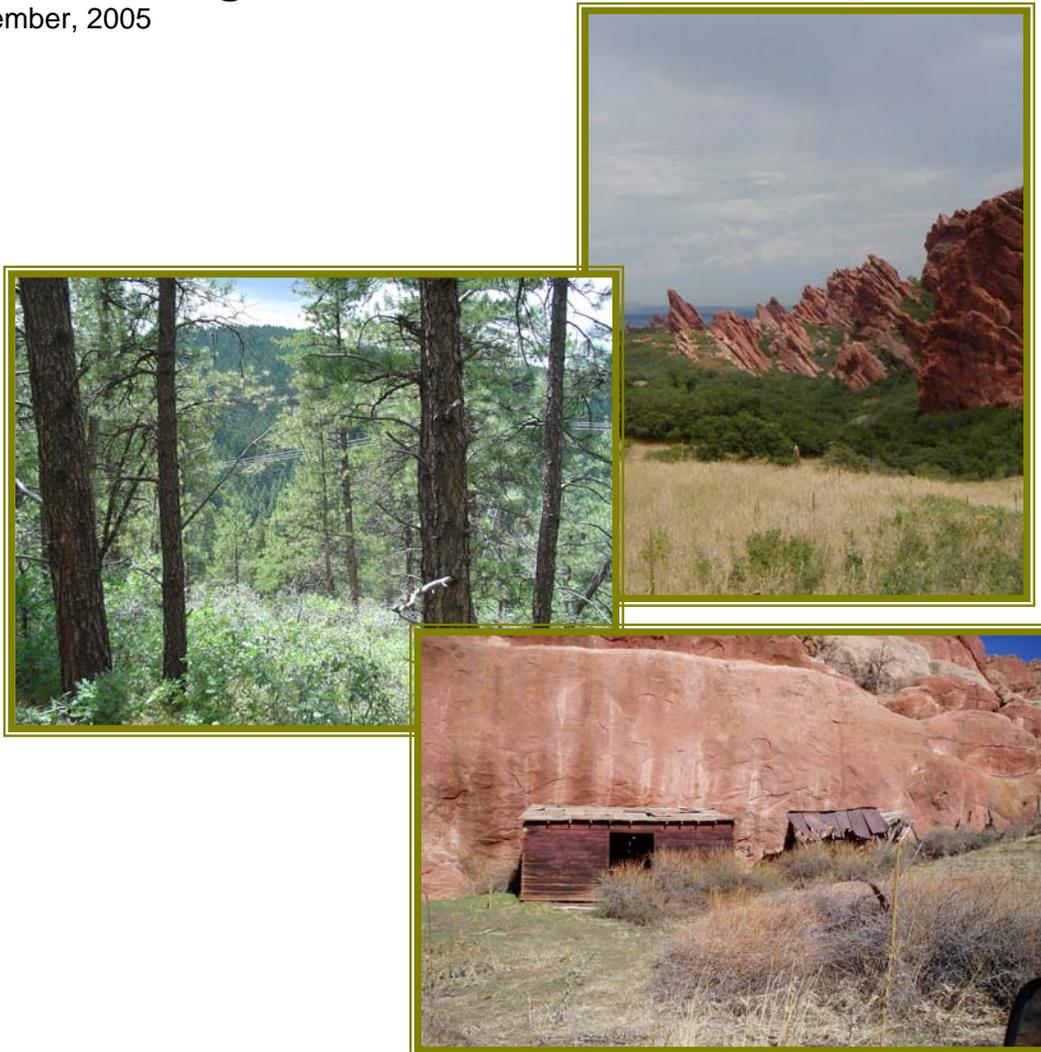
Colorado State Parks



Roxborough State Park

Fuels Management Plan

November, 2005



1. INTRODUCTION

As part of the National Fire Plan, the Federal Government has made funds available through the State Forester for state agencies to implement Hazardous Fuels Reduction Projects in order to reduce the risk of catastrophic wildfire events on State and Private lands. Colorado State Parks, working through the Colorado State Forest Service, has received National Fire Plan funds to reduce hazardous fuels in State Parks along the Front Range of Colorado, where the risk of catastrophic wildfire is highest. In partial fulfillment of reducing hazardous fuels in selected State Parks, a formal Fuels Management Plan is needed for these parks.

This plan provides a set of general recommendations, which will likely be modified due to site-specific needs, funding, implementation timing, available resources, and regulatory guidance. However, this plan is designed to outline areas within the park where fuels reduction activities will be suitable and desirable based on reducing risk of wildfire to park infrastructure, reduction of risk to park staff, visitors and fire suppression personnel, and ecological suitability of fuels reduction activities with current and desired vegetation conditions in targeted areas of the park.

Actual implementation of fuels reduction activities will likely be managed by Colorado State Forest Service personnel, with strong input and cooperation from State Parks Staff.

Proposed fuels reduction activities addressed in this report include:

- ◆ Thinning of dense oak brush stands for:
 - Creating fuel breaks in strategic areas
 - Creating defensible space around structures
 - Reduction of fuel loading along roadsides to facilitate evacuations
 - Improving forest health by renewing the decadent stand conditions

- ◆ Use of prescribed fire for:
 - Reduction in thatch and dead woody material
 - Ecological renewal of fire dependant ecosystems

This report is a cooperative effort between Colorado State Parks, Colorado State Forest Service, and Rocky Mountain Ecological Services, Inc.



Table of Contents

1.	Introduction	2
2.	Stewardship Plan Guidance	5
3.	AREA DESCRIPTION	5
4.	METHODOLOGY.....	6
5.	Proposed Mitigation Projects.....	8
5.1.	Grasslands Prescribed Fire Project.....	8
5.1.1.	Issues	8
5.1.2.	Treatment Goals.....	9
5.1.3.	Treatment Options.....	9
5.1.4.	Future Maintenance and Considerations.....	9
5.2.	Gambel Oak Thinning.....	11
5.2.1.	Issues	11
5.2.2.	Treatment Goals.....	12
5.2.3.	Treatment Options.....	12
5.2.4.	Fuel Break along DC-5 (Upper Rampart) Road:	12
5.2.5.	Future Maintenance and Considerations.....	13
5.3.	Creation of Defensible Space.....	14
5.3.1.	Issues	14
5.3.2.	Treatment Goals.....	14
5.3.3.	Treatment Options.....	14
5.3.4.	Future Maintenance and Considerations.....	15
5.4.	Mills Gulch Fuels Break.....	16
5.4.1.	Issues	16
5.4.2.	Treatment Goals.....	17
5.4.3.	Treatment Options.....	17
5.4.4.	Future Maintenance and Considerations.....	18
6.	Additional Fire Protection Concerns.....	18
6.1.	Water Supply	18
6.1.1.	Issues	18
6.1.2.	Options	19
6.2.	Fire Department Response and Access.....	19



6.2.1. Issues 19

6.2.2. Options 19

6.3. Fire Record Keeping 20

7. Needs prior to project implementation 23

8. Conclusion 23

9. References 24

10. Project Maps- Roxborough State Park 26

Map 4: Vegetation Types 29

Map 5: Fuel Types 30

MAP 6: Canopy cover 31

MAP 7: Amount of Ladder Fuels 32

MAP 8: Mountain Pine Beetle and Ips (spp.) beetle infestations 33

MAP 9: Other forest pathogens 34

MAP 10: Standing dead trees 35

MAP 11: Mechanical operability 36

MAP 12: Prescribed fire operability 37

Map 13: Fuels mitigation areas 38



2. STEWARDSHIP PLAN GUIDANCE

The Roxborough State Park Stewardship Plan sites the effects of fire exclusion as a natural resource challenge second only to weed infestation (Gershman Associates, Inc. 2002). The Stewardship Plan recommendations for shrublands and forests include:

- Maintain or simulate natural fire for plant and animal habitat benefits
- Reduce the risk of wildfire to neighboring communities

The impacts of fire exclusion specific to Roxborough include a buildup of wildland fuels and reductions in biodiversity and ecosystem health to varying degrees. These negative effects exacerbate the issue of invasive exotics, sited as the primary resource challenge for the park.

In examining recent large fires, it would appear fire is determined to reintroduce itself to the area, regardless of management decisions. Since 1996, four very large fires have reached within ten miles of the parks boundaries (see map at end of document). As internal fire exclusion and external fire occurrence come face to face, the surrounding area is experiencing pronounced residential development bringing both values at risk and potential sources for ignition to the borders of Roxborough State Park.

The Goal of this plan is to provide recommendations for fire and fuels management in terms of wildfire mitigation and ecosystem health.

The Objectives of this plan are to provide guidelines to:

- 1) Create defensible space around park infrastructure, cultural resources, and roads
- 2) Mitigate the high wildfire hazards by strategically placed fuels reduction projects
- 3) Aesthetically develop the fuels mitigation projects in a high visibility and heavily used State Park
- 4) Reintroduce or simulate natural disturbances for the maintenance of native ecosystems

3. AREA DESCRIPTION

Roxborough State Park's 3,299 acres host scenery, native ecosystems, wildlife habitat, recreation areas, and historic sites. These values, and those adjacent to the park, are increasingly threatened either by the negative impacts of fire exclusion or catastrophic wildfire.

In fire management terms, the lands around Roxborough State Park are potential sources of undesired fire as well as areas to be protected from fire crossing from or originating on park land. The Pike National Forest borders the park on the west and southwest. Douglas County Open Space is found along the south and east sides of the park. Privately owned land is dispersed along eastern and northern boundaries.



From 5,900 to 7,280 feet, the diverse ecosystems include the lower montane forest, mixed foothill shrub thicket, mixed grassland, riparian and wetland communities.

The forested upper elevations are dominated by Douglas-fir (*Pseudotsuga menziesii*) with some ponderosa pine (*Pinus ponderosa*) and Rocky Mountain juniper (*Juniperus scopulorum*). Aspen (*Populus tremuloides*) stands are located in the park, including under the Mill Gulch powerline. The following table is of commonly associated plants in these communities.

Common Name	Scientific Name
Common juniper	<i>Juniperus communis</i>
Serviceberry	<i>Amelanchier alnifolia</i>
Shreddy ninebark	<i>Physocarpus monogynus</i>
kinnikinnick	<i>Arctostaphylos uva-ursi</i>
Snowberry	<i>Symphoricarpos albus</i>
blue gramma	<i>Chondrosom gracile</i>
prairie Junegrass	<i>Koeleria macrantha</i>
golden aster	<i>Heterotheca villosa</i>
beard-tongue	<i>Penstemon spp</i>

Shrub thickets cover the dry slopes of almost half of the park. Shrub communities also exist as a forest understory at higher elevations. Prevalent shrub species include Gambel's oak (*Quercus gambelli*), mountain mahogany (*Cercocarpus montanus*), buckbrush (*Ceanothus fendleri*), skunkbrush (*Rhus aromatica* ssp. *trilobata*), and snowberry. In some areas the Gambel's oak has grown beyond its familiar brush form into small trees up to eighteen feet tall. The mixed grasslands of the park's eastern third are home to a variety of native perennials. Though recovering from once intensive grazing, exotic species are becoming an increasing concern.

4. METHODOLOGY

This plan examines site characteristics, values at risk, and the components of potential fire behavior. Specific treatments to mitigate the negative effects of wildland fire are then outlined and prioritized.

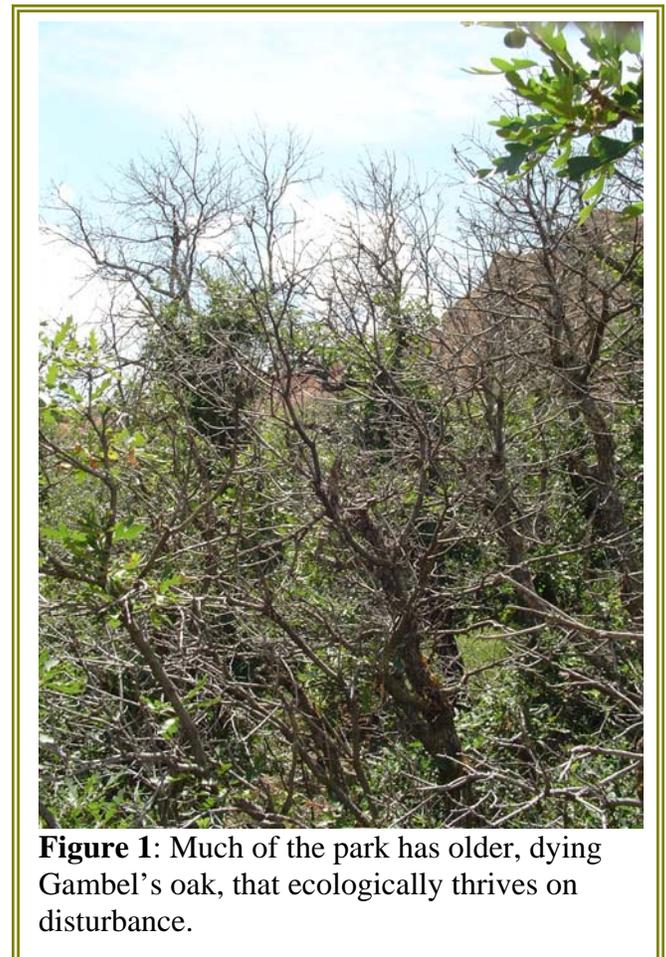


Figure 1: Much of the park has older, dying Gambel's oak, that ecologically thrives on disturbance.

A literature review was focused on existing studies of Roxborough State Park, characteristics of fuels and flora found within the park and fuel treatments that have been applied to similar fuel types. The majority of the stands were systematically visited within the park boundaries to observe fuel loading, operability and stand ecology. Some of the more remote stands where access was extremely limiting to future operations were not visited. Wetlands, cliffs and riparian forests were not visited, however many of these features were traversed. Fuel models and loading were determined using photo series guides and subjective criteria (Anderson 1982, Fisher 1981, Ottomar et al 2000). Treatment guidelines were then developed for these specific conditions.

While a variety of treatment options exist for most situations, this project developed treatment guidelines based on site specifics. The potential fire behavior for pre- and post-treatment was then modeled to assess treatment value and assist in refinement of recommendations.

Based on these field visits, we digitized similar forest types into ArcMap 8.3. These stands have associated photos (for the most part) and fuels loading estimates in the ArcMap attribute tables. Fuels loading estimates were done using NFES 2293 (Fisher 1981), Anderson 1982, and PMS 832 (Ottmar et al 2000). In many cases, different fuels profiles from different photos were used to describe fuels, and then use a subjective approach to determining the amount of fuels loading.

Each stand was also assigned a Fuel Model. Fuel models are a means of describing a wide variety of combustible conditions found in a wildland environment. Thirteen standardized fuel models are used in wildfire behavior prediction. Fuel size class, fuels loading in tons/acre, fuel bed depth, and fuel continuity across a landscape are all factors that are considered when assigning a fuel model to a specific stand. Since it is unrealistic to expect thirteen descriptions to represent the wide continuum of fuel beds found in the wild, fuel models are often combined by the percentage of an area they cover.

Proposed project areas were then prioritized based on what we thought would best:

- Protect park facilities from wildfires
- Provide fuels breaks in the park to allow suppression of fires before they did unacceptable damage to park resources.
- Protect the park from fires originating on adjacent private and Federal lands
- Provide needed stand management for ecological sustainability in the park while still providing fuels reduction and resource protection.

As part of this contract we were able to ground truth at least 90% of the stands, and Mindy Wheeler of WP Natural Resource Consulting, LLC was able to improve upon the existing GIS vegetation/fuels maps based on these site visits, however due to poor state of the GIS shapefiles when we received them, re-doing the entire GIS database for vegetation was beyond the scope and funding level for this project.



5. PROPOSED MITIGATION PROJECTS

5.1. GRASSLANDS PRESCRIBED FIRE PROJECT

5.1.1. Issues

While not always identified as a fire hazard, grass fuels are highly susceptible to ignition and can burn with surprising speed and intensity. This situation can be exacerbated by the invasion of the early curing and volatile Japanese brome (*Bromus japonicus*) and cheatgrass (*Bromus tectorum*).

The grasslands that dominate the eastern third of the park are comprised of disturbance adapted short and mid grass species. The fire return interval of short and mixed grass prairies is variable, but historically ranged from less than 10 years to 35 years (USDA Forest Service 2005). Fire has been suppressed in this area for the past several decades, and grazing use was discontinued in 1979.

Disturbances such as fire and grazing are often a healthful and integral component to a grassland ecosystem, but response of the individual species is dependant upon phenology, fire severity, and site condition. Invasive species that have been identified as a potential problem include Japanese brome, cheatgrass, yellow sweetclover (*Melilotus officinale*), and white sweetclover (*Melilotus albus*). Fuels moneys will be paired with GOCO funds to ensure that weeds are addressed and treated post-prescribed fire.

The prevalent western wheatgrass (*Pascopyrum smithii*), big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), prairie Junegrass (*Koeleria macrantha*), and blue gramma (*Bouteloua gracilis*) regularly benefit from fire. Other codominants, Indian ricegrass (*Achnatherum hymenoides*), green needle grass (*Nassella viridula*), needle and thread (*Stipa comata*), and purple three-awn (*Aristida purpurea*), are more sensitive to fire. Depending on soil moisture and fire severity, there may be beneficial or moderately negative effects from fire. These species typically recover from negative impacts within one to three years (USDA Forest Service 2005).

Healthy native grasslands are desired communities within the park. Periodic fire helps maintain the vigor of the native grassland by reducing the thatch layer and stimulating growth. Healthy grasslands can more successfully resist invasive species, but fire can also allow an opportunity for exotics to take hold. These tradeoffs must be carefully weighed for each site prior to the application of fire.



Figure 2: Grasslands dominate the eastern side of the park



5.1.2. Treatment Goals

- 1) Reduce the layer of thatch and litter in native grasslands.
- 2) Rejuvenate native grass communities.
- 3) Avoid impact to riparian areas and Preble's jumping mouse habitat
- 4) Avoid accelerating invasion of non-native grass and forb species

5.1.3. Treatment Options

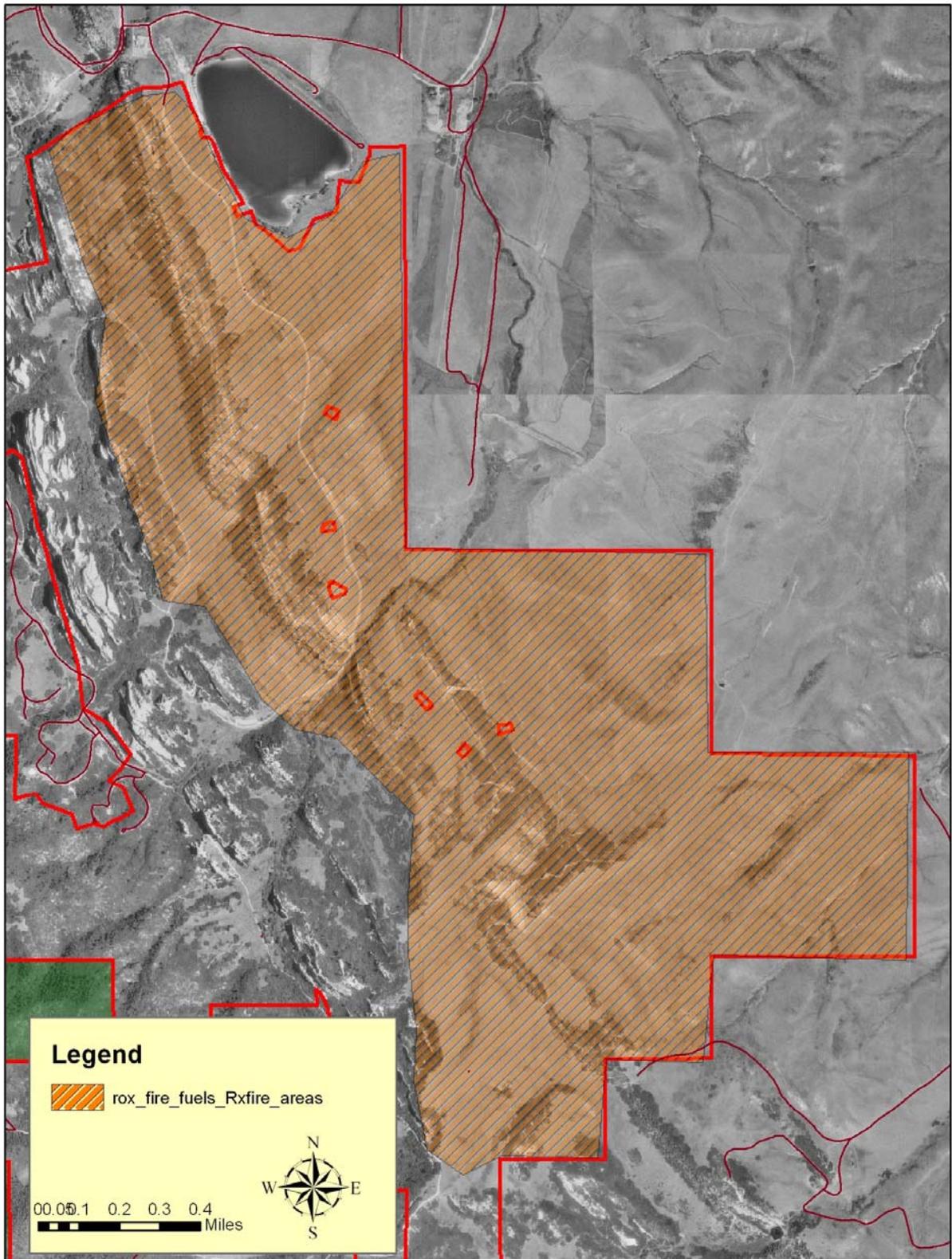
Prescribed fire is expected to meet the treatment goals in areas without substantial exotic plant populations. It can be one of the more affordable options, with costs often in the \$200 to \$250 per acre range (S. Woods, pers. com. 2005). Concerns include preparation of holding lines, coordination of resources, timing with weather and smoke dispersal conditions, and potential for escape. Grass is perhaps the easiest fuel type in which to mitigate these concerns. All prescribed fires must be accomplished while adhering to the requirements set forth in the Biological Evaluation approved by US Fish and Wildlife Service in 2005.

- 1) For areas with little or no presence of Japanese brome, cheatgrass, or sweetclovers:
 - Break the grasslands into prescribed fire units based on prevalence of invasive species and presence of logical control lines such as roads, trails, and topographic features.
 - Burn the units from early winter (November) through early spring (March) in a rotation of five to fifteen years. Monitor each unit to help identify season, fire behavior, and fire return intervals that produce the most desirable results.
- 2) For areas with high prevalence of Japanese brome, cheatgrass, or sweetclovers:
 - Application of fire should be avoided until other treatment options have been considered.
 - While fire has been used to suppress these invaders, they more typically benefit from disturbance. A combination of treatments is often applied, including herbicides.

5.1.4. Future Maintenance and Considerations

Noxious weed management in these areas will require yearly treatment for the first two to three years, after this time, every other year treatments for maintenance will likely be sufficient. If native grasses do not establish themselves within a couple of years, reseeding the area with a locally native seed mix should be strongly considered. If funds are available in the beginning, staff should consider using a native seed mix (again, appropriate for the ecosystem) post-fire to help crowd-out exotics.





5.2. GAMBEL OAK THINNING

5.2.1. Issues

Almost 50% of the park is covered by shrublands comprised primarily of Gambel's oak with mountain mahogany, buckbrush, skunkbrush, snowberry, and yucca (*Yucca glauca*). The fire return intervals in Gambel's oak ranges from less than 30 years up to 100 years, and the condition of shrub stands reflect this variability (USDA Forest Service 2005). Through the absence of fire, Gambel's oak stands have grown decadent and reached heights of twelve to eighteen feet tall. Through age, frost kill, and drought stress these stands have built up a large dead component and constitute a serious hazardous fuel concern.

While tall, dense stands of Gambel's oak provide valuable cover for wildlife, they may provide poor forage and suppress the growth of forbs and grasses. Top killing of Gambel's oak and other shrub species typically promote vegetative sprouting (USDA Forest Service 2005). As such, mechanical or prescribed fire treatments alone, while insufficient to eradicate shrub stands, can serve to convert the stands to a more productive forage type and less hazardous fuel.

Application of prescribed fire in the park's brush fuels is problematic. Under conditions that will support the desired treatment goals, fire behavior may prove difficult to contain. There are areas of shrub thickets that are bordered by rock outcroppings and grasslands that may be candidates for fire reintroduction. Given the overall continuity of the shrub fuels and the proximity of dense residential development, any such project must be approached with extreme caution and is not recommended until after mechanical treatments reduce the fuels loading and continuity.



Figure 3: Photo of more large patches of decadent oakbrush with high dead components that could be rejuvenated by mechanical means

Depending on the size of the treatment area, access issues, and other issues the cost of hydro-axe treatment can range from \$200 to \$1,000 per acre. Hand thinning with saws can cost in excess of \$1,500 to \$2,000 per acre, not including chemical treatment. Hand thinning also requires subsequent disposal of the cut biomass.



5.2.2. Treatment Goals

As the oakbrush is so thick and decadent with high amounts of dead material, fuels hazards are very high to extreme in many areas of the park. Given the high cost of treating these stands, areas have been selected to address the following:

- 1) Create defensible space around park infrastructure and visitor egress roads while providing for esthetics
- 2) Create defensible space around historic sites and cultural resources
- 3) Initiate pilot projects for larger scale oak brush treatment
- 4) Treat oak brush, linking grasslands to create defensible fuel profiles

5.2.3. Treatment Options

Mechanical treatments are the preferred methods in the brush fuels at this time. Thinning and limbing with chainsaws is recommended where esthetics or access limitations are an issue. Saws can be used to limb and thin the brush understory, while leaving the mature oak canopy. This can be done with irregular edges to mimic more natural borders. Herbicides can be applied to cut stumps in non-sensitive areas to prevent aggressive resprouting. Chemical treatment should be applied to the stumps within an hour of cutting. Garlon 4 has been used in the past with some success, but Arsenal has met even more favorable results in a BLM case study and does not have the twelve hour walk-back restriction that Garlon does (Dan Sokal, Glenwood Springs BLM 2005).

Larger scale treatments will begin with test plots in the southern end of the park. If the results are acceptable, further treatments in the area may be approved to link grasslands together, creating a lower intensity fuel zone (Appendix I, Map 2). Over the next ten years 30% to 50% of the oak thickets may be targeted for treatment. The hydro-axe is the recommended treatment for this project. This machine functions like a large lawnmower, masticating the brush and achieving the desired fuel reduction efficiently and without the need for off-site disposal. They are designed to create minimal soil disturbance and are able to create a patchy mosaic patterns amidst the brush.

5.2.4. Fuel Break along DC-5 (Upper Rampart) Road:

Following test plots, this will be the initial focus of treatment. The road affords access, provides a starting point for the project, and will assist in the defensibility of historic sites concentrated along his corridor.



Figure 4: Dense brush impinges on portions of the upper Rampart Road.



- 1) Where access, size of the treatment area, and other factors allow, the more efficient treatment of brush fuels is with a Hydro-axe or similar machinery.
- 2) Where aesthetics are a concern:
 - Oak thickets should be cut back from the road ten to thirty feet using irregular “edges”.
 - Remaining brush within 100 feet of the road should be thinned to 1000 to 1500 stems per acre using chain saws.
 - The focus should be on removing dead stems.
 - Limbs and brush below 4.5 feet high should be reduced in favor of more mature oak, but periodic breaks in the canopy should be included.

5.2.5. Future Maintenance and Considerations

As Gambel's oak and other shrubby species will aggressively re-sprout, it is important to consider using herbicides along high priority areas where re-growth is not desired. Widespread herbicide application to treated areas is not likely feasible due to aesthetics, ecosystem function, and cost. However in areas where fuel breaks and defensible space are the priority, then prevention and/or minimization of regrowth should be considered to keep fuels from becoming hazardously dense again. Application of Garlon or equivalent herbicide to recently (within 2 hours) cut stumps is recommended to prevent aggressive resprouting. Oak brush and other stands will regrow over time, but maintenance of already thinned stands will be considerably less intensive of work when compared to initial thinning and removal of large amounts of dead material. Some stands may need some pruning and treatment ever 5 to 10 years.

The openings in these stands should quickly become established with native grasses and forbs, but also possibly noxious weeds. Weed treatment in these areas should be anticipated. Reseeding should not be needed, as natives suitable to these areas should reestablish themselves within 3 years.



5.3. CREATION OF DEFENSIBLE SPACE

5.3.1. Issues

In addition to the park's visitor center, there are at least four sites with historic buildings or ruins. The survivability of these structures will be enhanced by the creation of defensible space. Research indicates that radiant heat from a crown fire is unlikely to ignite structures with a minimum of 70 feet of defensible space (Cohen 1998). Direct flame impingement and embers may also ignite structures. If firefighters are defending structures, the defensible space should be at least four times the expected flame height around the structure (Scott 2003).

While the visitor center is fire resistant masonry and slate roof construction, the historic structures are extremely susceptible to ignition. Defensible space in the strictest sense might not be consistent with visual concerns or absolutely necessary. Specific recommendations for reducing fuels around the structures are outlined that can be quickly improved by crews in advance of a fire, yet retain some native vegetation close to the structures.



Figure 5: Even with noncombustible construction, the Visitors Center should have defensible space.

5.3.2. Treatment Goals

- 1) Reduce the potential for ignition of structures from radiant heat and flame impingement.
- 2) Create areas immediately surrounding structures that can be rapidly improved for increased defensibility.

5.3.3. Treatment Options

- 1) Visitors Center:
 - North side: follow guidelines as provided for historic structures
 - West side: within 15 feet of structure remove oak brush <3 inch dbh. Limb remaining trees to 3 feet
 - East side: within 5 feet of structure remove oak brush <3 inch dbh. Limb remaining trees to 3 feet. Within 30 feet of structures reduce oak brush <3 inch dbh by 50%. Limb oak stems >3 inches dbh to 4 feet



2) Historic Buildings and Ruins:

- Within 100 ft of structures, create 5 ft spacing between mature (dbh > 4 inches) oak crowns and limb branches to 4.5 ft. Reduce brush height to 2 ft.
- Within 30 ft remove brush fuels (taller than 1' and dbh <4 inches)
- Within 15 ft of structure keep grass well trimmed
- Herbicide treatment (Garlon, Arsenal, or similar product) should be considered where consistent with visitor safety and natural resource constraints.



Figure 6: Some historic buildings may be worth spending mitigation dollars to protect them, others may be too far in disrepair.

3) Park Access Roadside Thinning:

- Approximately 0.5 miles east of the visitor center, the main park access road is impinged by brush. Brush fuels should be cleared a minimum of 30 feet on each side of this road.

5.3.4. Future Maintenance and Considerations

As Gambel's oak and other shrubby species will aggressively re-sprout, it is important to consider using herbicides along high priority areas where re-growth is not desired. Widespread herbicide application to treated areas is not likely feasible due to aesthetics, ecosystem function, and cost. However in areas where fuel breaks and defensible space are the priority, then prevention and/or minimization of regrowth should be considered to keep fuels from becoming hazardedly dense again. Application of Garlon or equivalent herbicide to recently (within 2 hours) cut stumps is recommended to prevent aggressive resprouting. Oak brush and other stands will regrow over time, but maintenance of already thinned stands will be considerably less intensive of work when compared to initial thinning and removal of large amounts of dead material. Some stands



Figure 7: Access and egress from the visitor center must be protected.



may need some pruning and treatment ever 5 to 10 years.

The openings in these stands should quickly become established with native grasses and forbs, but also possibly noxious weeds. Weed treatment in these areas should be anticipated. Reseeding should not be needed, as natives suitable to these areas should reestablish themselves within 3 years.

5.4. MILLS GULCH FUELS BREAK

5.4.1. Issues

The Ponderosa pine and Douglas-fir forests along the Front Range of Colorado have a history of varied fire size, severity, and frequency. Throughout these forests, fire size has been found to range from one tree to landscape scale and from low severity to stand replacing fire behavior. Composite mean fire return intervals in these forest types range from 13 to over 40 years. In general, however, lower elevation ponderosa pine and south facing slopes are more prone to low severity surface fire, while high intensity burning and crown activity is more likely to occur at higher elevations and on northern exposures (Brown et al. 1999, Veblen et al. 2000).

Veblen et al. (1996) believed that their data and previous studies (Goldblum and Veblen 1992) clearly established that the last 80 years of fire suppression have created a notable departure from the relatively high frequency fire regime of the pre-European settlement era. Photographic evidence was cited as indicative of “dramatic” increases in the density of ponderosa pine in the lower elevation woodlands and encroachment into meadows and grasslands. There is also evidence that Douglas-fir is becoming dominant on previously mixed sites due to fire exclusion (Peet 1981). The Xcel powerline on the west side of the park affords an opportunity to create a fuel break along the park boundary, while helping to protect a powerline and the neighboring community. With the current state of electrical power distribution, the loss of a major powerline during the summer months has extensive economic implications and brings the effects of wildland fire into the homes of major cities.

From the southwest corner of the park, the powerline trail runs north from the end of the upper Rampart Road. These south facing slopes can be treated by thinning or eliminating oak patches to link together grasslands. The trail then intersects with the powerline in the Mill Creek bottom. This area is dominated by aspen stands that will

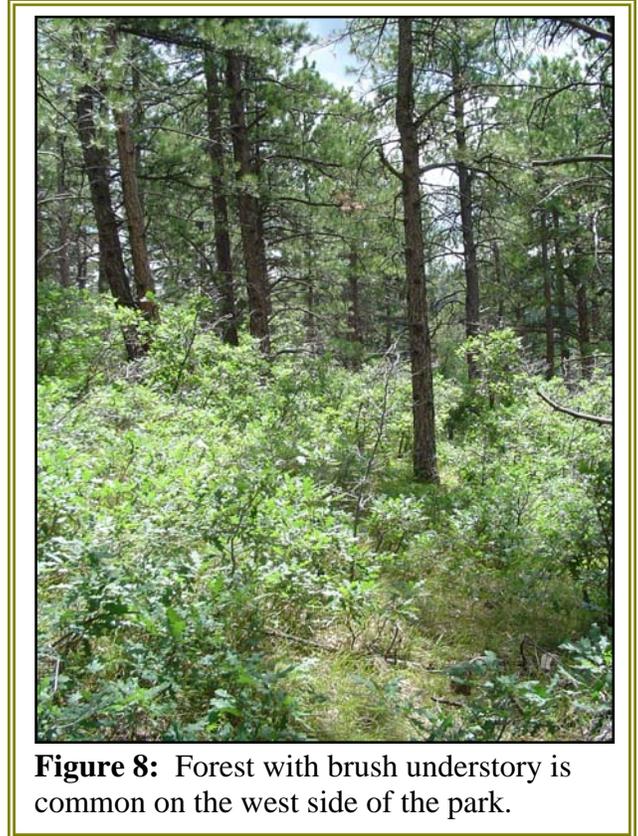


Figure 8: Forest with brush understory is common on the west side of the park.



require minimal work. Much of the remainder of this proposed fuel break is Douglas-fir with oak understory.

These types of shaded fuel breaks are strategically located zones in which flammable vegetation has been removed or altered to decrease potential fire behavior. They are not intended to halt the spread of fire on their own, but to provide an anchor point for indirect attack efforts or even prescribed fire projects. The minimum width of a fuel break in timber is typically 200 feet (Agee 2000). This type of treatment usually involves the reduction of surface fuels, ladder fuels such as small trees and low branches, and thinning of the overstory. Such projects are not intended to be timber harvests, but the utilization of merchantable materials can be used to help defray costs.

Further coordination with the Pike National Forest and Colorado State Forest Service is necessary before the Mills Gulch project is initiated. The Pike National Forest is planning a vegetation restoration project immediately to the west of Mills Gulch which may render this particular project redundant (Appendix I, Maps 2 and 3). This Upper South Platte Watershed Protection and Restoration Project is slated for the 2006 fiscal year (Culver 2005).

5.4.2. Treatment Goals

- 1) Create a shaded fuel break along the powerline on the west boundary of the park
- 2) Provide a viable area from which to initiate indirect attack
- 3) Create a zone unlikely to support the initiation or propagation of crown fire

5.4.3. Treatment Options

- 1) Create a shaded fuel break 200 to 250 feet wide, utilize and improve existing grass areas on south facing slopes and aspen stands in Mill Gulch.
- 2) In areas of shrub fuels:
 - Eliminate brush to link or widen grass areas.
 - Along the powerline trail and under the powerline itself, treat according to the DC-5 road guidelines (see section 4.2.4 above).
 - When found as an understory to timber, thin to a minimum of 1200 stems per acre, reduce height to 2 feet, eliminate under tree canopies.



Figure 9: Powerlines run along aspen stands on the western edge of the park



3) In forested areas:

- Reduce surface fuel load to approximately 5 tons per acre.
- Reduce surface fuel height to 2 feet or lower.
- Employ mechanically based logging to reduce basal area from 40 to 60 square feet / acre.
- On remaining trees, raise canopy base height from 5 to 12 feet high, but not greater than 40% of total foliage.
- Create 10 feet of clearance between crowns of trees or tree groups (max of 7 trees) (Dennis 1983, Fielder 2003, Village of Ruidoso 2004)

5.4.4. Future Maintenance and Considerations

As Gambel's oak and other shrubby species will aggressively re-sprout, it is important to consider using herbicides along high priority areas where re-growth is not desired. Widespread herbicide application to treated areas is not likely feasible due to aesthetics, ecosystem function, and cost. However in areas where fuel breaks and defensible space are the priority, then prevention and/or minimization of regrowth should be considered to keep fuels from becoming hazardously dense again. Application of Garlon or equivalent herbicide to recently (within 2 hours) cut stumps is recommended to prevent aggressive resprouting. Oak brush and other stands will regrow over time, but maintenance of already thinned stands will be considerably less intensive of work when compared to initial thinning and removal of large amounts of dead material. Some stands may need some pruning and treatment ever 5 to 10 years. Sprouting of aspen in these areas is permissible, as aspen usually does not contribute to fire intensity, and often allows understory grasses and forbs to have higher moisture contents due to shading.

The openings in these stands should quickly become established with native grasses and forbs, but also possibly noxious weeds. Weed treatment in these areas should be anticipated. Reseeding should not be needed, as natives suitable to these areas should reestablish themselves within 3 years. Aspen will likely sucker in localized pockets, which aforementioned is permissible.

6. ADDITIONAL FIRE PROTECTION CONCERNS

6.1. WATER SUPPLY

6.1.1. Issues

A reliable water supply is essential for structure preparation and defense during a wildfire. Within the park, there are no apparent reservoirs, ponds, or streams that are suitable for fire service use on a year round basis. The fire hydrant closest to the visitor center is over 2 miles away, placing it over 4 ground miles away from the historic Persse site. The delivery of water to the historic sites and inholdings along the upper Rampart Road would necessitate a shuttle operation along this one-lane dirt road to access fire hydrants in the Roxborough Park subdivision. The placement of a fire service water



supply in the vicinity of the visitor center should be strongly considered. A water supply source along the upper Rampart Road is of secondary concern.

The use of water sources for fire suppression by helicopters can lead to myriad of problems if prior arrangements have not been made. Agreements between fire suppression agencies and reservoir owners may already exist, but this should be confirmed.

6.1.2. Options

- 1) Develop natural water supplies- Determine if draft sites can be developed along Willow Creek or other intermittent streams or springs.
- 2) Install improved water supplies- Install dry hydrants or cisterns that are easily accessed by suppression forces working near the visitor center and along the upper Rampart Road.
- 3) Helicopter dip sites- Ensure that preexisting agreements have been obtained and documented for the use of Rampart Reservoir and North Willow Creek Reservoir for helicopter bucket use.

6.2. FIRE DEPARTMENT RESPONSE AND ACCESS

6.2.1. Issues

West Metro Fire Station 15 is immediately outside of the park entrance. Its structure engine, brush engine, and ambulance are staffed by four firefighters with wildland fire training. Second due engines respond from West Metro Station-14 and South Metro Fire Department.

Engine access to the visitor center along the main park road is excellent. The one-lane dirt road that provides access to the western half of the park is less tenable. The safety of access along the upper Rampart Road will be greatly enhanced once brush fuels have been cleared along the road. Both of these roads provide only one way in and out, requiring that safety zones along these roads be identified before fire crews can commit to assignments along them.

The Perse site may be accessed by brush engines using the Fountain Valley trail. This access may be compromised if trail conditions or vegetation clearance is not maintained.

6.2.2. Options

- 1) Vegetation clearance along roads- This will be achieved during the fuel break construction outlined in this report.
- 2) Safety zones- It may be helpful for suppression resources if potential safety zone sites are preplanned and identified on maps.



6.3. FIRE RECORD KEEPING

It should be noted that attempts to determine fire occurrence within Roxborough State Park from recent or historic records were unsuccessful. The Colorado State Forest Service, West Metro Fire Protection District, Pike National Forest, and the park itself were all contacted in an attempt to find fire occurrence information, with no success.

Accurate fire records are essential for determining trends in fire cause and specific environmental fire danger indices. Fire prevention programs and fire danger rating systems are depend on this sort of information. As such, Roxborough State Park may wish to ensure that such records are being kept by the Colorado State Forest Service, West Metro, or the park itself. These records should include time, date, cause, size, location, and resources assigned as a minimum.



TREATMENT SUMMARY TABLE

Grassland Rx Fire	Acres	Priority	Treatment	Est. Cost
Unit #1	200	3	Broadcast Burn	\$15,000
Unit #2	500	3	Broadcast Burn	\$18,000
Unit #3	350	3	Broadcast Burn	\$16,000
Planning Costs	NA	3	CSFS/CSP Planners	\$10,000
Nox. Weed Treat	500	3	Spot Spraying	\$4,000
Oak Thinning				
Hydro-Axe Units	300	2	Hydro Axe	\$96,000
Hand-thinning Units	5	3	80% removed	\$9,000
Chem. Application	15	2	Stump-treatment	\$15,000
Nox. Weed Treat	300	2	Spot spraying	\$3,000
D-Space				
Visitors Center	2	1	Thin	\$700
Entrance Road	1	1	Thin	\$2,500
Other Structures	2	1	Thin	\$7,000
Chem Application	1	1	Stump treatment	\$300
Nox. Weed Treat	1	1	Spot Spraying	\$250
Rampart Road Thinning				
Hand Thinning	15	1	70% removed	\$27,000
Chem Application	7	1	Stump treatment	\$2,500
Nox. Weed Treat	10	1	Spot Spraying	\$4,000
Mills Gulch Fuel Break				
Understory Thin	70	4	Hydro-Axe	\$55,000
Overstory Thin	35	5	Mechanical	\$30,000
Road Improvement	NA	3	Grading	\$6,000
Nox. Weed Treat	15	4	Spot Spraying	\$7,000

Assumptions for Treatment Summary Table:

RX Fire- Base cost of \$200-\$250 per acre, however after initial burning and planning is completed, costs should dramatically decrease. Estimates shown above should be on the high side. Unit acreages are arbitrary based on natural unit boundaries and roads to be used as existing containment lines. Using "wet lines" should be effective and relatively inexpensive, especially if local West Metro fire department resources are utilized.

Oak Thinning- Base cost of \$800 per acre using Hydro-Axe. Larger units, or units treated back-to-back will reduce mobilization costs, which will be around \$2,000. Hand thinning units should be only used in high visibility or high sensitivity areas, due to very slow production rates, and high costs. Hand thinning is based on a \$1,800/hour rate for a hand crew. The cost estimates above may be a bit low for hand crews, unless Convict Crews are utilized. Chemical treatments should only be necessary near roads- the



entire area does not need to be stump-treated. Acres are based on treating approximately ½ of the oak brush stands over time.

D-Space- Hand thinning will be utilized around structures. Most of the cut-stumps should be treated with Garlon or equivalent herbicide. The main entrance road should be thinned back as well, and cut-stump treated. Historical structures should be inventoried to determine which structures are worth doing defensible space around, and which ones are not, this could save some funds.

Rampart Road Thinning- Much of the oak next to the road could be hand-thinned to keep aesthetics high; however, Hydro-axe treatments would likely be cheaper, especially if the equipment has already been mobilized to the park. With the road adjacent to the oak brush, treating slash and brush may be easier by having a chipper on the road if hand thinning is used. In some areas, stump-treating should be considered if the road will be used as a fire break for some time, but simply regenerating the stand through thinning and treatment will produce a more fire-resistant stand with lower fire severity and intensity if the stand did burn.

Mills Gulch Fuels Break- As USDA Forest Service will be treating fuels quite close to Mills Gulch, having a large thinning or fuels manipulation project here may prove to be redundant. However if funds are available, then this fuels break would improve defensibility of the park, improve protection for Xcel's power line, and could be used to increase stand diversity in the area. Both understory manipulation of oakbrush and overstory thinning of ponderosa pine should be considered. Understory thinning should be done using machinery given the acres involved. Due to steeper slopes in this area, tracked vehicles would likely be necessary-possibly a smaller, more maneuverable piece of equipment such as a tracked skid-steer with a flail system may work well to thin out this oakbrush. Road work will be necessary to allow machinery into the area, regardless of the types of equipment used.



Skid-Steer Mounted Mower/Mulcher- Much cheaper than a Hydro-Axe, this kind of equipment works well in oakbrush-stumps may be a bit higher, but equipment is also much more maneuverable in tight spaces and in timber. This setup was used by RMES contractors (Larson Trucking out of Basalt, CO) in 2005, and was very cost-efficient; the only problem was that in warm weather the equipment overheated periodically and needed to stop to cool down. **For the cost table, I used a traditional Hydro-Axe rate, not one of these smaller units.**



7. NEEDS PRIOR TO PROJECT IMPLEMENTATION

Prior to Implementation, the following needs should be addressed:

- 1) Park boundaries need to be surveyed and flagged in thinning areas for easy identification.
- 2) Noxious weeds should be treated in project areas prior to burning/thinning operations.
- 3) Ensure Colorado State Forest Service has received mitigation measures required by State Parks and US Fish and Wildlife Service and ensure that contractors and/or parks staff overseeing the project implement such mitigations.

8. CONCLUSION

Roxborough State Park faces the challenge of overcoming the effects of fire exclusion amidst increasing suburban development and nearby large fire occurrences. By investing in wildland fuel reduction around park structures and roads, the defensibility of park values will be greatly enhanced. By working in conjunction with Xcel power, the Colorado State Forest Service and the Pike National Forest, a fuel break along the west side of the park can help protect not only powerlines, but the park itself. The careful reintroduction of fire into the park grasslands can be an invaluable tool for the maintenance of ecosystem health. Large-scale mechanical treatment of brush fuels can help reduce potential fire behavior and improve wildlife habitat.

All of these efforts require not only an initial investment but also a commitment to long-term maintenance. While there is no guaranteed defense against large scale, catastrophic crown fire, pursuing these projects will produce fire safety and ecosystem benefits. Responsible natural areas stewardship in the 21st century requires an effort to mitigate the negative impacts of wildfire and the hazard to fire suppression crews.



9. REFERENCES

- Agee, James K. Benii Bahro, Mark A. Finney, Philip N. Omi, David B. Sapsis, Carl N. Skinner, Jan W. van Wagtendonk, and C. Philli Weatherspoon. 2000. The Use of Fuelbreaks in Landscape Fire Management. *Forest Ecology and Management*. 127:55-66
- Anderson, H.E. 1982. *Aids to determining fuel models for estimating fire behavior characteristics*. USDA Forest Service General Technical Report INT-122.
- Brown, P.M., M.R. Kaufmann, and W.D. Shepperd. 1999. Long-term, landscape patterns of past fire events in a montane ponderosa pine forest of central Colorado. *Landscape Ecology* 14:513-532.
- Cohen, Jack D., Butler, Bret W. 1998. Modeling potential ignitions from flame radiation exposure with implications for wildland/urban interface fire management. In: *Proceedings of the 13th conference on fire and forest meteorology, vol. 1*. 1996 October 27-31; Lorne, Victoria, Australia. Fairfield, WA: International Association of Wildland Fire; 81-86.
- Culver, Steve. 2005. Personal correspondence. Pike National Forest. February 2005
- Dennis, F. C. 2003. *Creating Wildfire-Defensible Zones no. 6.302*. Colorado State University.
- Dennis, F. C. 1983. *Fuelbreak guidelines for forested subdivisions*. Colorado State University.
- Fiedler, Carl E., Charles E. Keegan. 2003. Reducing crown fire hazard in fire-adapted forests of New Mexico. USDA Forest Service Proceedings RMRS-P-29.
- Fisher, William C. 1981. *Photo guide for appraising downed woody fuels in Montana forests*. USDA Forest Service General Technical Report INT-97.
- Goldblum, D. and T.T. Veblen. 1992. Fire history of a ponderosa pine / Douglas-fir forest in the Colorado Front Range. *Physical Geography* 13:133-148.
- Gershman Associates, Inc. 2002. Roxborough State Park stewardship plan. Colorado State Parks.
- Ottmar, Roger D.; Vihnanek, Robert E.; Wright, Clinton S. 2000. *Stereo photo series for quantifying natural fuels. Volume III: lodgepole pine, quaking aspen, and gambel oak types in the Rocky Mountains*. PMS 832. Boise, ID: National Wildfire Coordinating Group, National Interagency Fire Center.
- Peet, R.K. 1981. Forest vegetation of the Colorado Front Range: composition and dynamics. *Vegetation* 45: 3-75.



Petterson, Eric. 2004. Biological Assessment for Colorado State Parks hazardous fuels reduction projects. Rocky Mountain Ecological Services, Inc.

Scott, Joe H. 2003. Canopy fuel treatment standards for the wildland-urban interface

USDA Forest Service Proceedings RMRS-P-29.

Sokel, Dan. 2005. Personal correspondence. Pike National Forest. February 2005.

Swetnam, T.W. 1997. *Fire history studies in the Colorado Front Range: a brief literature review and prospectus for future research*. Fort Collins, CO: Rocky Mountain Research Station.

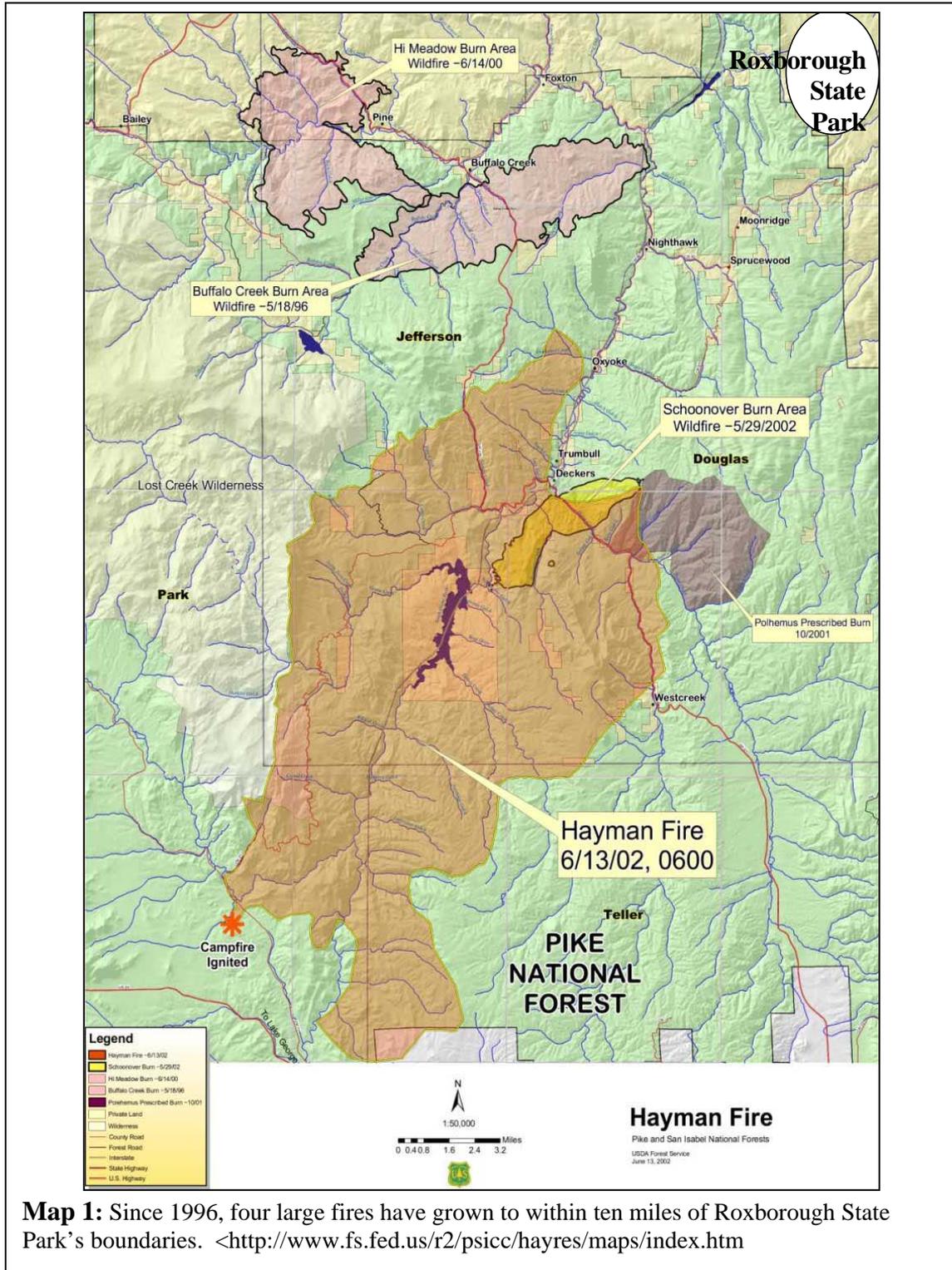
USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2005, February). Fire Effects Information System, [Online]. Available: <http://www.fs.fed.us/database/feis>.

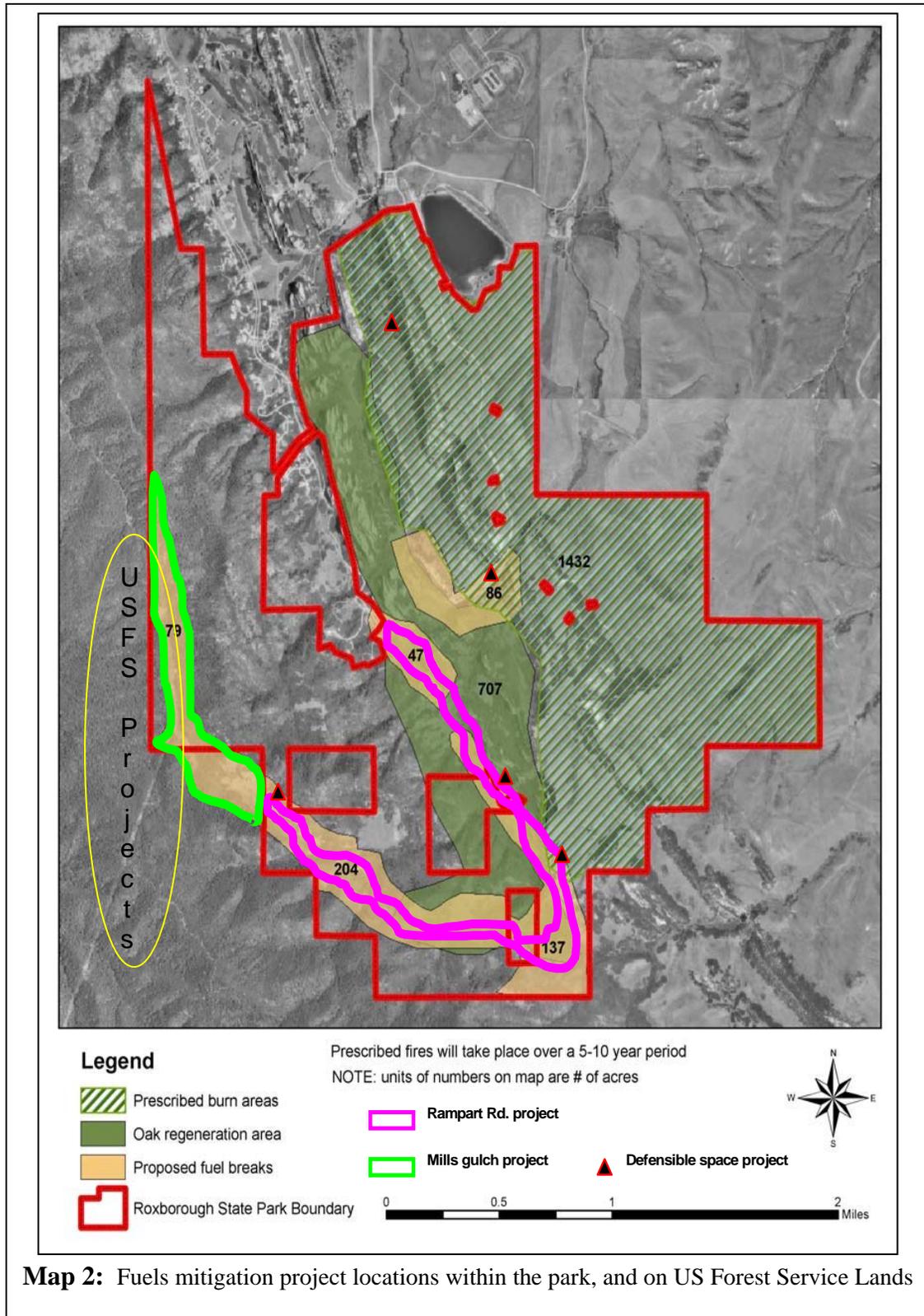
Veblen, T.T., T. Kitzberger, and J. Donnegan. 2000. Climatic and human influences on fire regimes in ponderosa pine forests in the Colorado Front Range. *Ecological Applications* 10(4). 1178-1195.

Village of Ruidoso, New Mexico. 2004. A summary of required fuels management standards (Sec. 42-80) Ord. 2004-02.

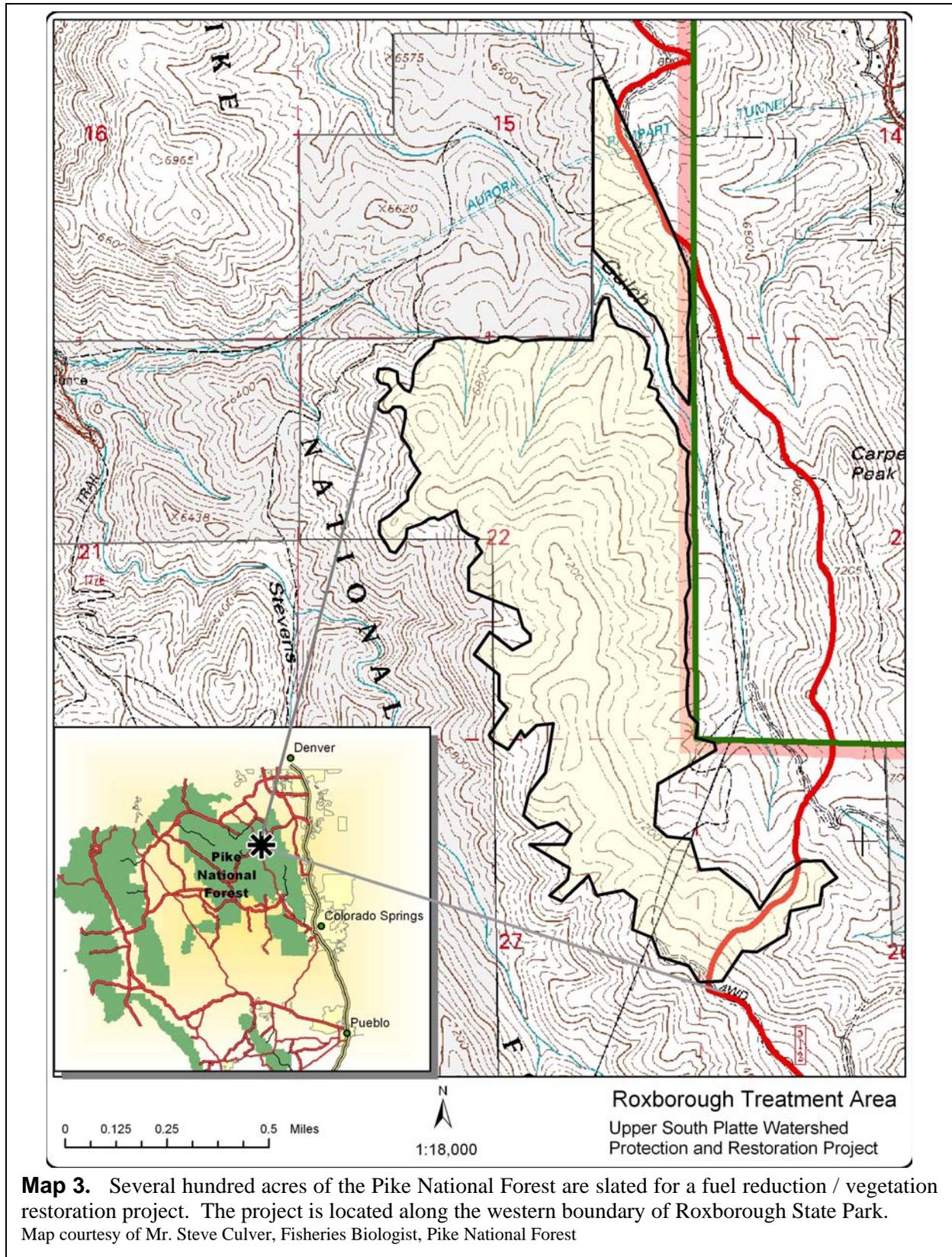


10.PROJECT MAPS- ROXBOROUGH STATE PARK



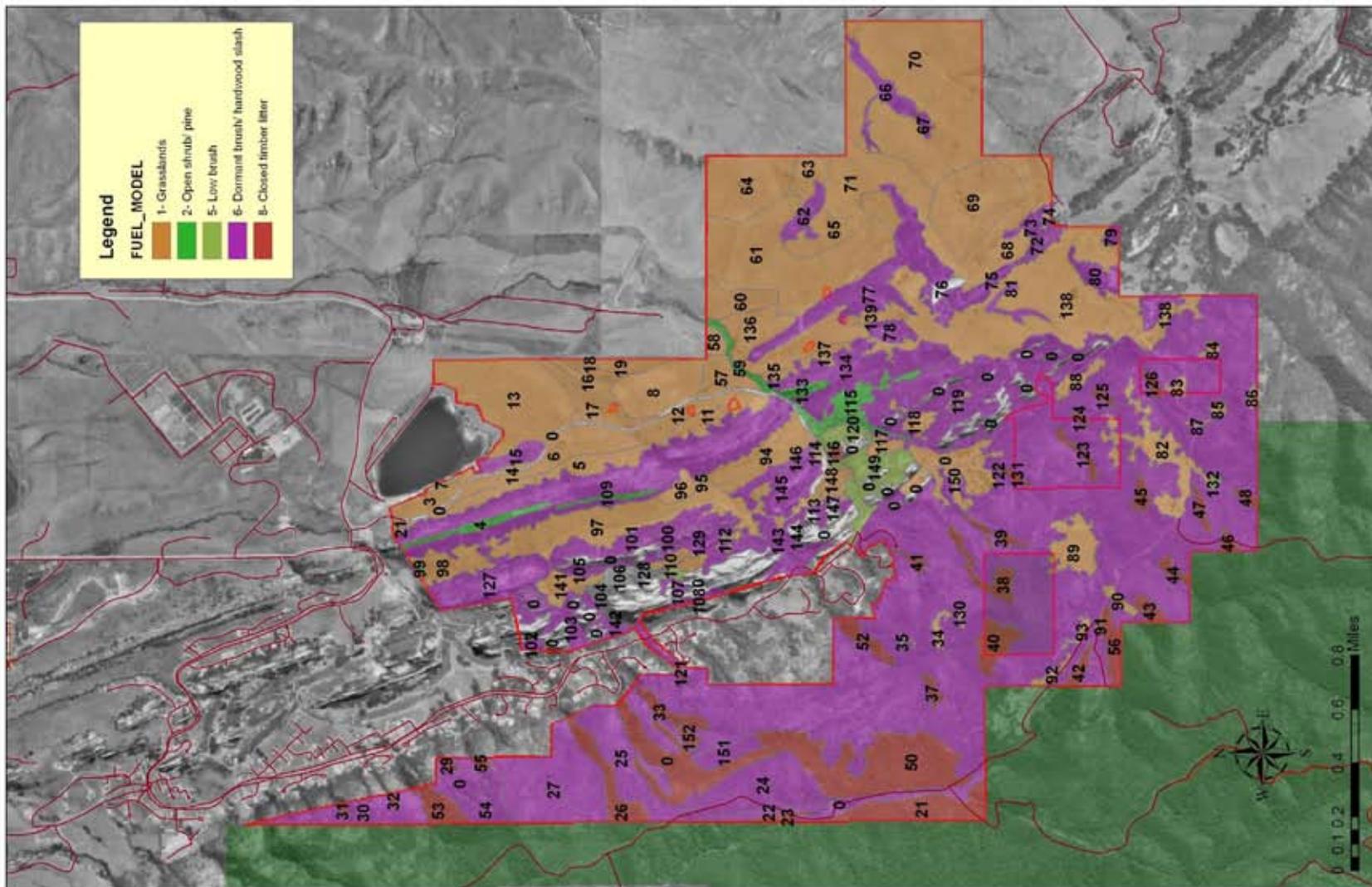


Map 2: Fuels mitigation project locations within the park, and on US Forest Service Lands

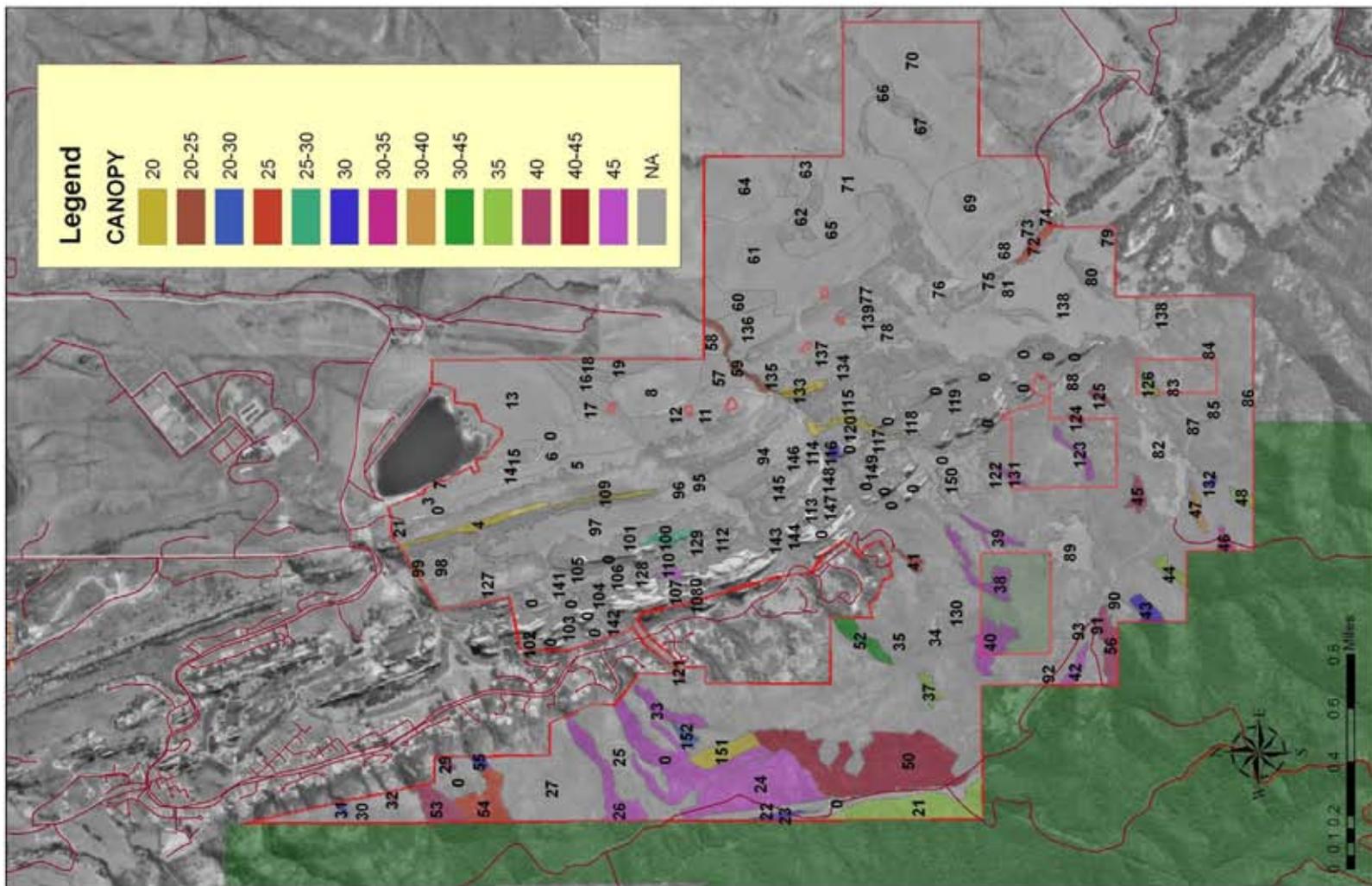


Map 3. Several hundred acres of the Pike National Forest are slated for a fuel reduction / vegetation restoration project. The project is located along the western boundary of Roxborough State Park. Map courtesy of Mr. Steve Culver, Fisheries Biologist, Pike National Forest

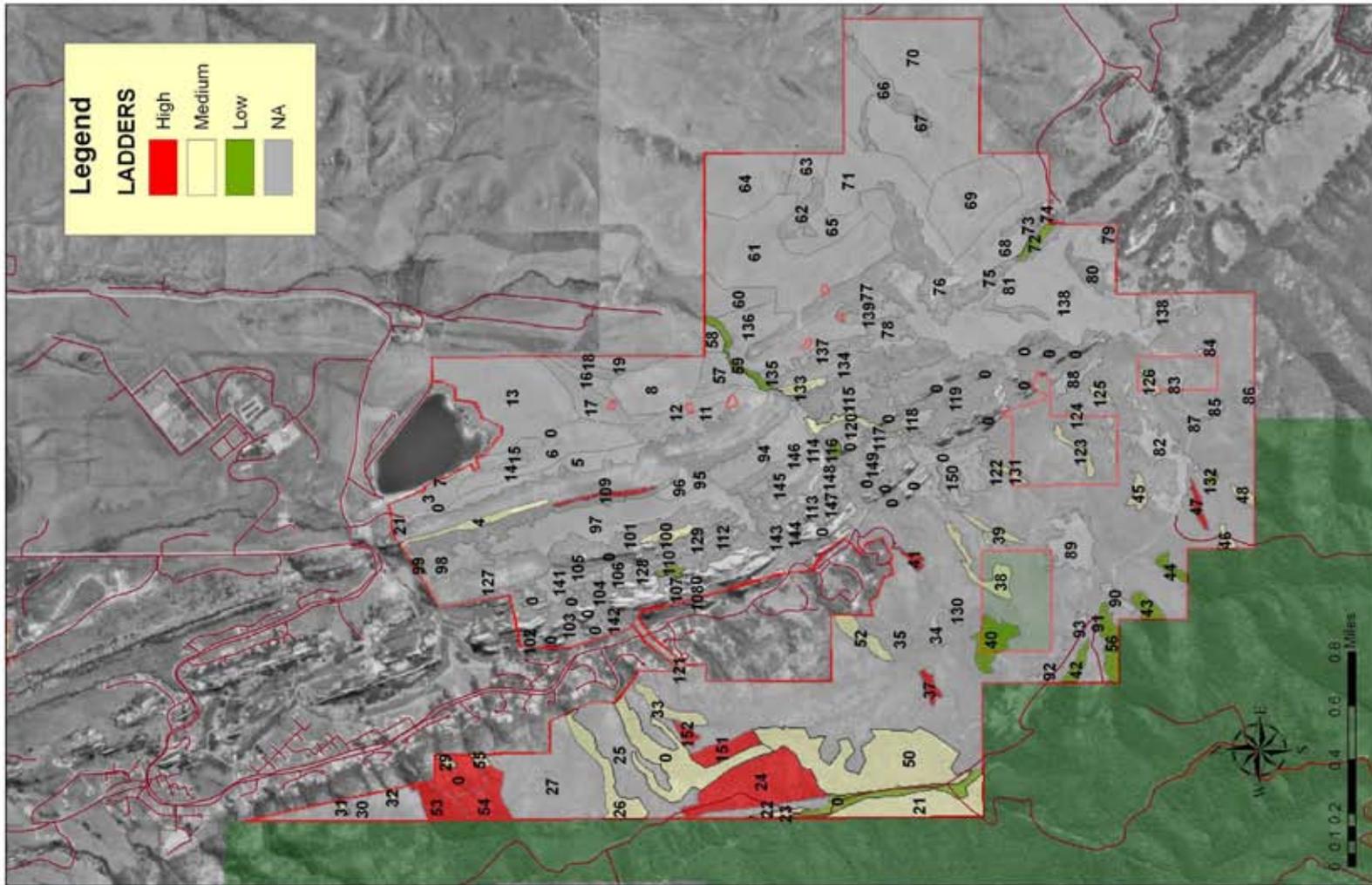
MAP 5: Fuel Types and Stand Numbers



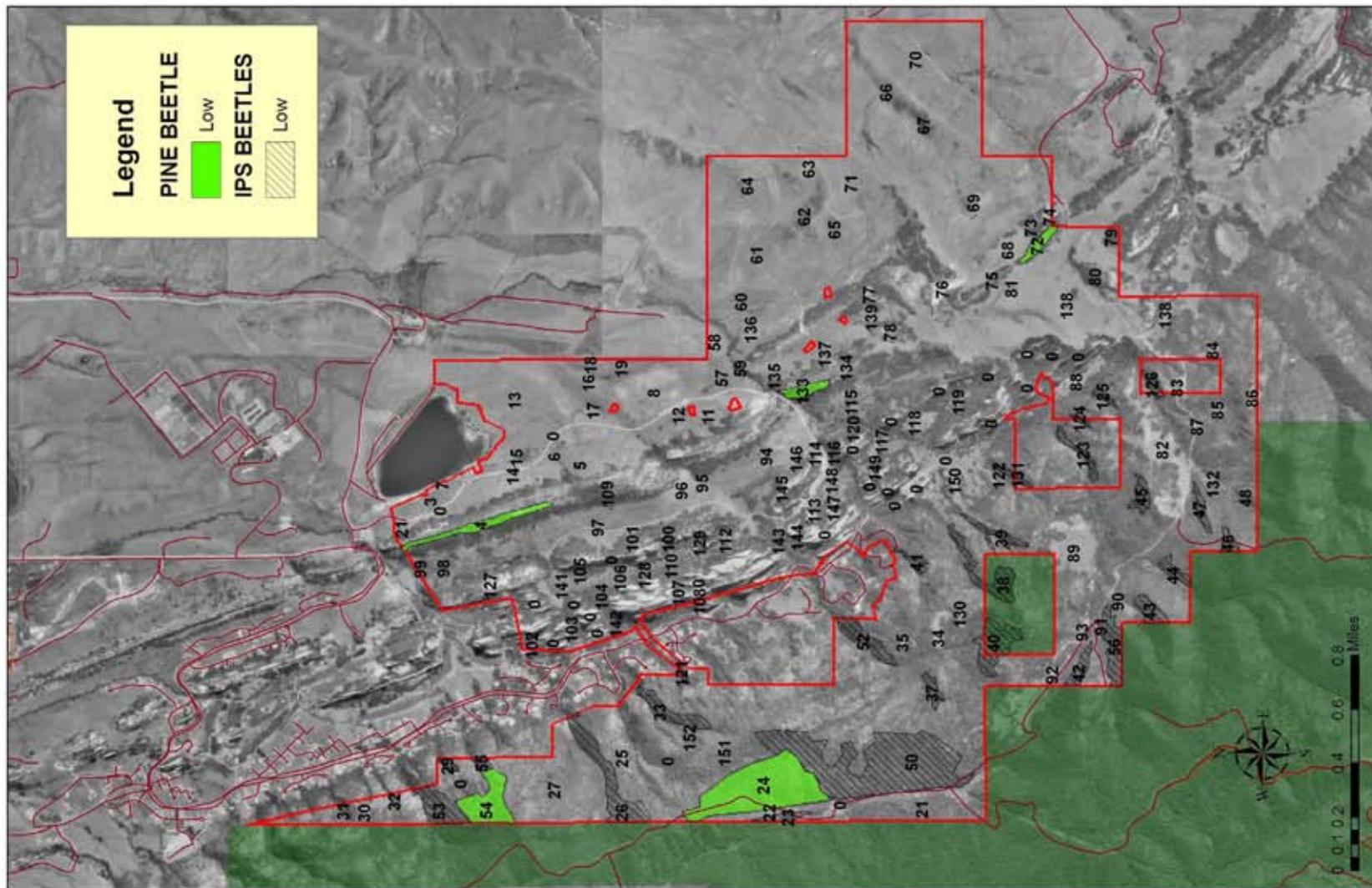
MAP 6: Canopy cover & stand numbers



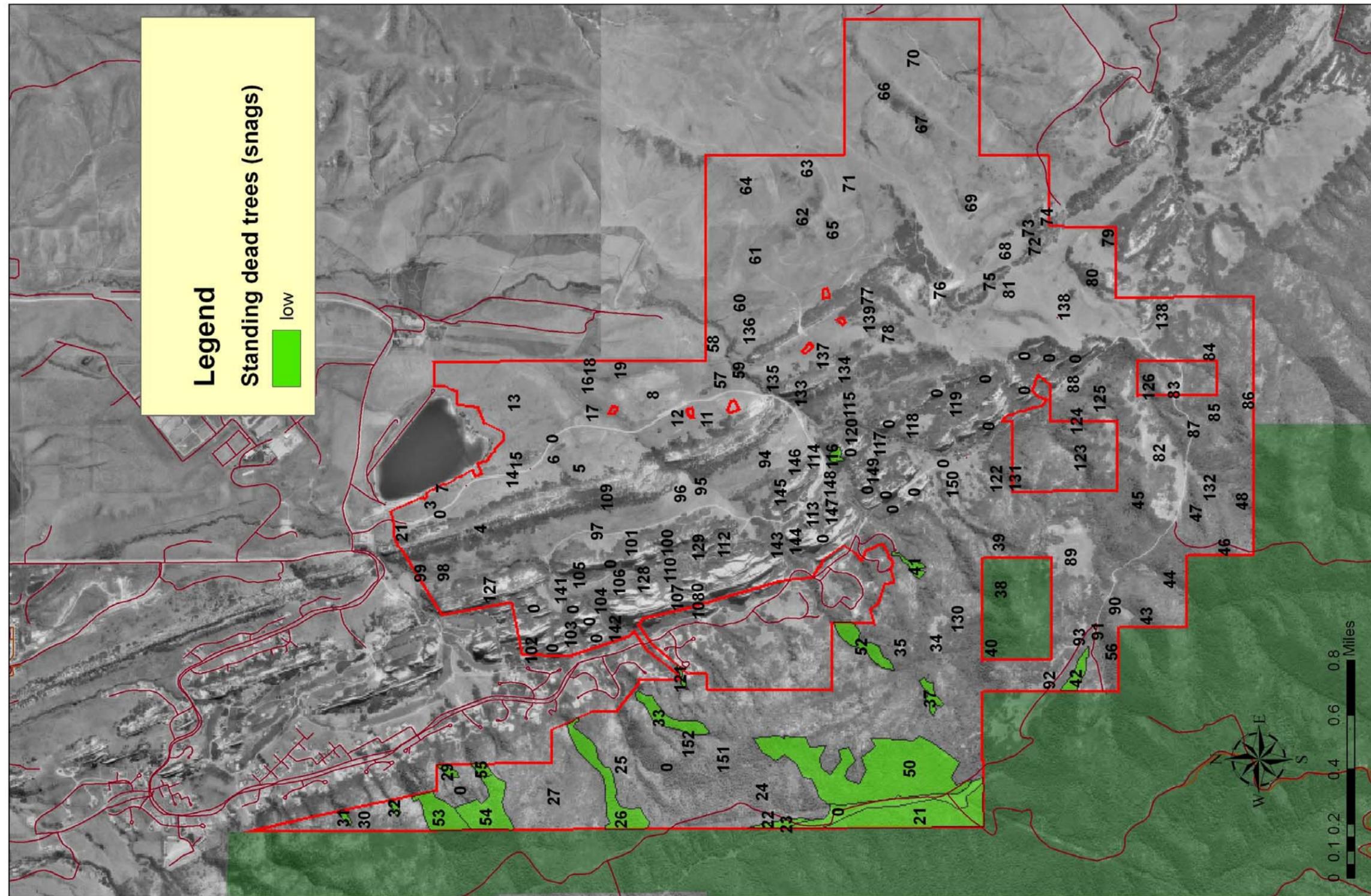
MAP 7: Amount of Ladder Fuels and Stand numbers- oakbrush stands by nature have high ladder fuels



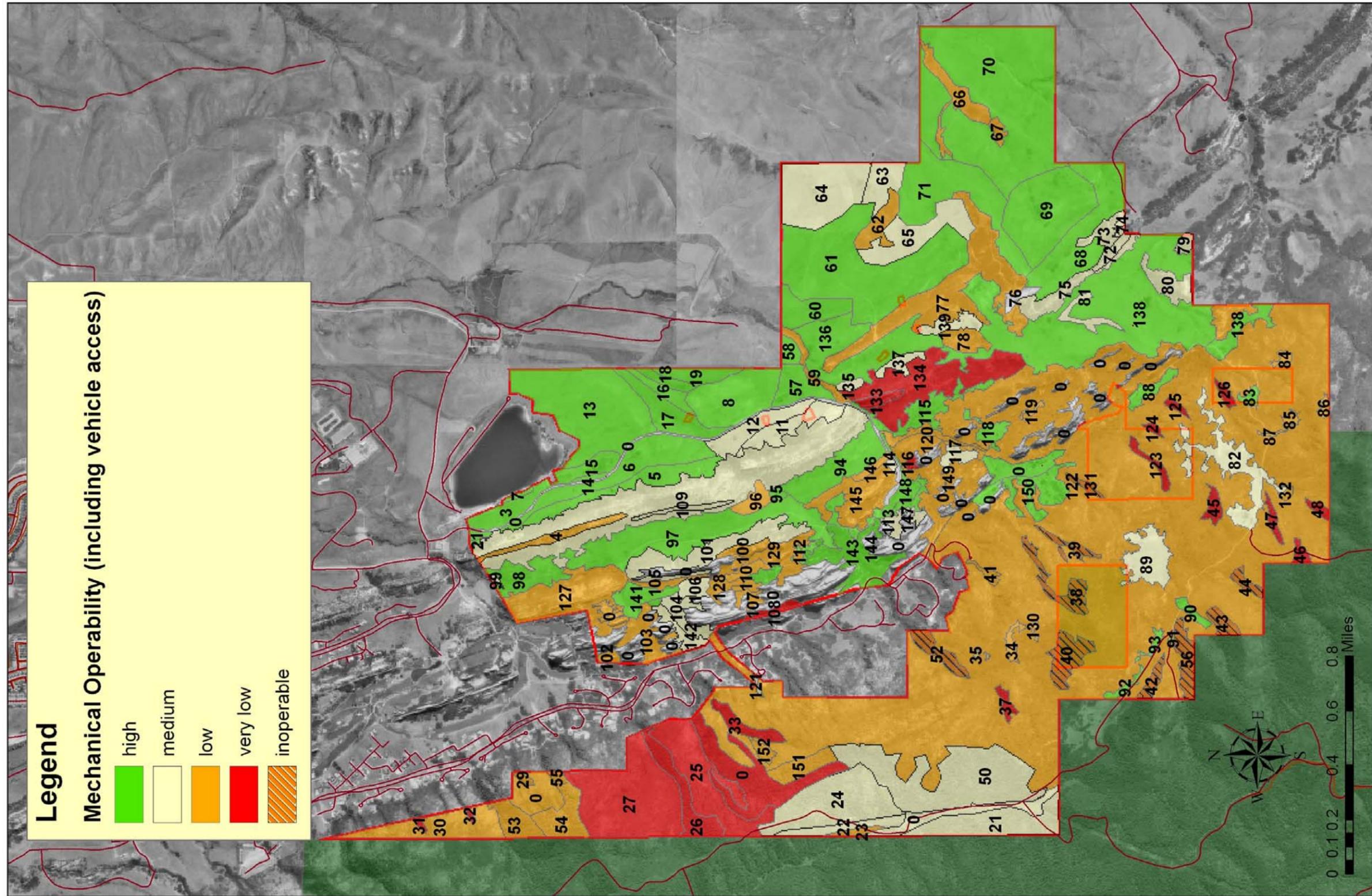
Map 8: Mountain Pine Beetle and Ips (spp.) beetle infestations



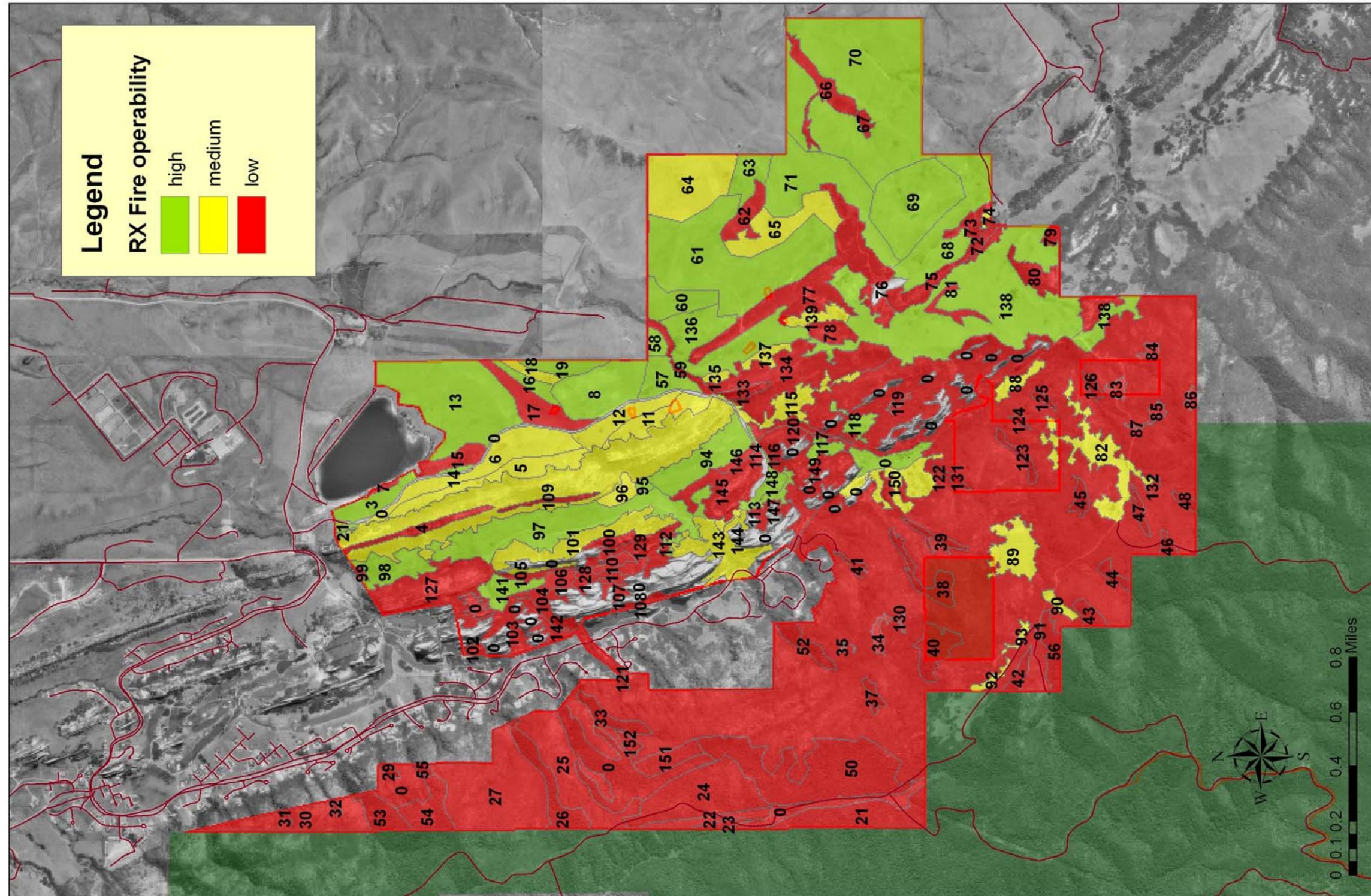
MAP 10: Standing dead trees (snags) and stand numbers



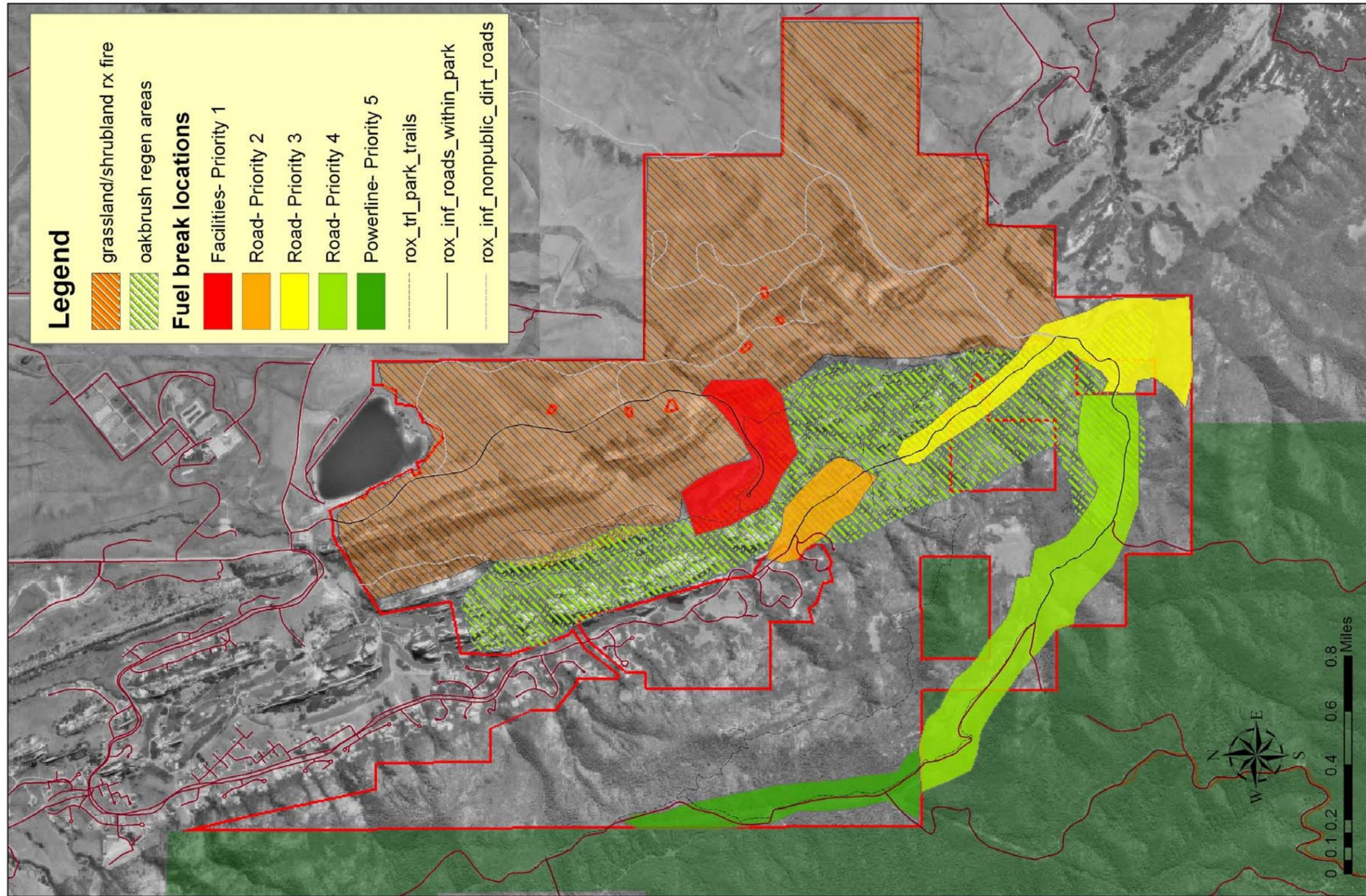
MAP 11: Mechanical operability (including vehicle access) & stand numbers



MAP 12: Prescribed fire operability & stand numbers



MAP 13: Fuels mitigation areas (D-Space, Thinning & Rx Fire), and park trails and roads



Appendix F Fire Hazard Classes and Fuel Models

Fire Behavior Vegetation Characterizing Fire Hazard Classes*

HAZARD CLASS	EXPECTED FIRE BEHAVIOR	VEGETATION (FUELS)
0	None	None (Open water, bare rock, cultivated fields etc.)
X Severe Hazard (Brush)	Flames 5-20' high, of brief duration; high spread rates, at least 40 acres/hr; humans can not safely pass through flames but can occupy burned area within about 15 minutes; short range spotting from blowing embers common.	Dense to moderately dense flammable vegetation <= 10' high, including Gambel Oak, Big Sagebrush, conifer reproduction; abundant litter and/or herbaceous fuel, scattered conifer stand may be present.
A Low Hazard	Flames <= 5' high, higher flare-ups rare; duration of highest flames brief; fire spread slow to fast, 1-40 acres/hr; humans can usually run through flames without serious injury and can occupy just-burned areas; spotting generally rare short range.	Grass, weeds, brush <= 1' high, dead wood in contact with ground; open conifer stand may be present; includes aspen, cottonwood, willow, grasslands, brush other than oak, sage or ceanothus.
B Moderate Hazard	Intermittent flare-ups occurring up to many feet above tree tops; short and medium range spotting common; behavior between flare-ups as in Class-A; passing through fire front sometimes possible but chancy; parts of burned area can be occupied within half hour.	Medium density conifer stands; surface fuel mainly herbage and litter; some patches of reproduction and dead wood; becomes Class-C if slash is present.
C Severe Hazard (Trees)	Flareups higher than tree tops frequent to continuous; spread rates of up to several hundred acres per hour possible; fire front impassable; spotting several hundred yards common, possibly up to 1 mile or more; just burned areas untenable for >= an hour.	Dense conifer stands with any surface fuel; medium density stands with Class-X fuels or much dead wood from blowdown. Insect activity, or logging.

0 Hazard = No Hazard or Limited Hazard

X Hazard = Severe Wildfire Hazard (Brush)

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

B Hazard = Moderate Wildfire Hazard for Grass, Timber Brush

C Hazard = Severe Wildfire Hazard (Trees)

* Courtesy of the *Colorado State Forest Service*

National Fire Danger Rating Fuel Models

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

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

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

Appendix G

Common Terms - National Fire Danger Rating System (NFDRS)

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

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

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

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

Fire Load Index (FL) - A rating of the maximum effort required to contain all probable fires occurring within a rating area during the rating period. It is the cumulative index of the NFDRS. It is designed to combine the projections of fire occurrence and behavior into a single number that can be related to the total fire suppression job. The meaning of FL has been left to the user. By itself, it does not tell the user much about the nature of the fire management problem. One needs to examine the individual components and indices that are the basis for the FL. It ranges over a scale of 1-100 and has no units.

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

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

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

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

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

Lightning Activity Level (LAL) - A numerical rating from the lowest of 1 to the highest of 6, keyed to the start of thunderstorms and the frequency and character of cloud-to-ground lightning

forecasted or observed on a rating area during a rating period.

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

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

March 10, 2006

Appendix H
Roxborough Park
CWPP

ANNUAL FIRE OPERATING PLAN

FOR

DOUGLAS COUNTY

2006

TABLE OF CONTENTS

TABLE OF CONTENTS	2
1. PLAN APPROVAL	5
2. IDENTIFICATION OF THE PARTICIPATING AGENCIES OF THIS PLAN	8
3. AUTHORITY FOR THE PLAN -	8
4. PURPOSE OF THE PLAN.....	8
5. DEFINITIONS AND DESCRIPTIONS	9
A. Fire Management Responsibilities	9
B. Mutual Aid Dispatch Areas by Dispatch Levels	9
C. Mutual Aid Move-up and Cover Facilities	9
D. Special Management Considerations.....	9
E. Responsibility for Non-Wildland Fire Emergencies.....	9
F. Repair of Wildfire Suppression Damage	9
6. FIRE MANAGEMENT RESOURCE LIST	9
7. PROTECTION AREA MAPS (see attachment B).....	10
8. FIRE READINESS.....	10
A. Fire Planning	10
B. Wildfire Training Needs and Coordination.....	11
C. Inspection Schedules	11
9. WILDFIRE SUPPRESSION PROCEDURES	11
A. ICS Use	11
B. Detection Standards.....	12
C. Relationship with Local Mobilization Guide	12
D. Notification About Fires	12
E. Establishment and Revision of Mutual Aid Dispatch Areas.....	13
F. Initial Attack Dispatch Levels and Their Determination.....	13
G. Dispatching and Resource Order Process	14
PERSONS AUTHORIZED TO ORDER STATE OR FEDERAL FIRE MANAGEMENT RESOURCES IN DOUGLAS COUNTY.	14
H. Reinforcements and Support.....	15
I. Move-up and Cover Locations and Procedures.....	15
J. Interagency procurement, loaning, sharing, or exchanging and maintenance of facilities, equipment, and support services	15
K. Interagency Sharing of Communications Systems and Frequencies	15

L.	Wildland Fire Situation Analysis	16
M.	State Emergency Fire Fund (EFF)	17
N.	Dispatch Centers or Other Incident Support Facilities.....	19
O.	Post-incident Action Analysis	19
P.	Out-of-Jurisdiction Assignments.....	19
10.	AVIATION PROCEDURES	20
A.	Aviation Map and Narrative	20
B.	Flight Following/Frequency Management.....	20
C.	Call When Needed (CWN) Aircraft, Tactical and Support Aircraft.....	20
D.	Fixed Wing Base Management	21
E.	Single-Engine Tanker Bases	21
F.	Leadplane / Air Attack Activation	22
G.	Aviation Requests And Operations.....	22
H.	Inspection Schedules	22
I.	Aviation Dispatch Procedures	22
11.	FIRE PREVENTION -	23
A.	General Cooperative Activities	23
B.	Information and Education.....	23
C.	Engineering	24
D.	Enforcement	24
12.	FUEL MANAGEMENT AND PRESCRIBED FIRE CONSIDERATIONS.....	25
13.	COST REIMBURSEMENTS	26
A.	Non-Reimbursable Items.....	26
B.	Reimbursable Items.....	26
C.	Wildfire Prevention	27
C.	Wildfire Readiness.....	27
E.	Wildfire Suppression.....	27
14.	GENERAL PROCEDURES.....	28
A.	Periodic Program Reviews	28
B.	Annual Updating of Plans	29
C.	Changes During Year (due to budget cuts or supplemental funding).....	29
D.	Resolution of Disputes Procedure	29
E.	Duration of Agreement.....	29
15.	DIRECTORY OF AUTHORIZED AGENCY REPRESENTATIVES.....	29
A.	Bureau of Land Management	29

B.	Colorado State Forest Service	29
C.	USDA Forest Service	30
D.	Bureau of Indian Affairs	30
E.	National Park Service	30
F.	Fish and Wildlife Service	30
G.	Douglas County	30
H.	Fire Departments	30
I.	Denver Water Board	30

- Attachment A** - Resources
- Attachment B** - Maps
- Attachment C** - Cooperator Incident Reimbursement Guidelines
- Attachment D** - WFSA Form/CSFS Form 166 Escaped Fire SA/CSFS Form 108a
- Attachment E** - Use Rates
- Attachment F** - CRRF Forms
- Attachment G** - Agreement for Cooperative Wildfire Protection
- Attachment H** - Interagency Cooperative Wildfire Protection Agreement
- Attachment I** - Emergency Fund Contract for Forest and Watershed Fire Control
- Attachment J** - PSICC Radio Frequency List
- Attachment K** - Wildfire Emergency Response Fund Guidelines
- Attachment L** - Cost Share Principles

ANNUAL OPERATING PLAN

The Annual Operating Plan (AOP) is a working document compiled each year by the following participating agencies. This plan is generally considered attached to and part of the Interagency Cooperative Fire Protection Agreement (see Clause #8 of the Agreement).

1. PLAN APPROVAL

The parties below agree to the procedures contained in this Annual Fire Operating Plan. Refer to Section 14.B for Annual Review Procedure. Plan will be effective from May 1st to the following May 1st of each year.

DOUGLAS COUNTY SHERIFF'S OFFICE

By: _____ Date: _____

BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF DOUGLAS

APPROVED AS TO CONTENT:

By: _____
Melanie Worley
Chairman

By: _____
Douglas DeBord
County Administrator

Date: _____

Date: _____

ATTEST:

APPROVED AS TO FORM:

By: _____
Mary Niblack
Clerk and Recorder

By: _____
Lance J. Ingalls
County Attorney

ANNUAL OPERATING PLAN

The Annual Operating Plan (AOP) is a working document compiled each year by the following participating agencies. This plan is generally considered attached to and part of the Interagency Cooperative Fire Protection Agreement (see Clause #8 of the Agreement).

The party below agrees to the procedures contained in this Annual Fire Operating Plan. Refer to Section 14.B for Annual Review Procedure. Plan will be effective from May 1st to the following May 1st of each year.

COLORADO STATE FOREST SERVICE

By: _____ Date: _____

ANNUAL OPERATING PLAN

The Annual Operating Plan (AOP) is a working document compiled each year by the following participating agencies. This plan is generally considered attached to and part of the Interagency Cooperative Fire Protection Agreement (see Clause #8 of the Agreement).

The party below agrees to the procedures contained in this Annual Fire Operating Plan. Refer to Section 14.B for Annual Review Procedure. Plan will be effective from May 1st to the following May 1st of each year.

USDA FOREST SERVICE

By: _____ Date: _____

2. IDENTIFICATION OF THE PARTICIPATING AGENCIES OF THIS PLAN

Colorado State Forest Service

Douglas County Sheriff's Office

Board of County Commissioners, Douglas County, Colorado

USDA Forest Service

3. AUTHORITY FOR THE PLAN -

This Plan fulfills requirements in the latest "Interagency Cooperative Fire Agreement" between the State of Colorado and the USDA Forest Service, USDI National Park Service, Bureau of Land Management, Bureau of Indian Affairs, and Fish and Wildlife Service (ATTACHMENT H).

This Plan fulfills Section D-1 for the "Agreement for Cooperative Wildfire Protection" signed May 19, 1989 between Douglas County and the State Board of Agriculture, and hereby becomes part of that agreement as Attachment 3 (ATTACHMENT G).

This Plan fulfills Article I.2. of the "Emergency Fund Contract for Forest and Watershed Fire Control" between the State of Colorado and Douglas County and becomes Attachment B of that agreement (ATTACHMENT I).

This Plan fulfills Sections 2.B and 2.D for the "Fire Management Agreement" between the City and County of Denver (through the Denver Board of Water Commissioners) and the State Board of Agriculture (on behalf of the Colorado State Forest Service). This Fire Management Agreement remains in effect until December 31, 2005, unless terminated by either party as specified in the agreement.

This Plan fulfills Article I.2. of the "Emergency Fund Contract for Forest and Watershed Fire Control" between the State of Colorado and the Denver Board of Water Commissioners and becomes Attachment B of that agreement.

This Plan acknowledges the Douglas County Wildland Fire Management Agreement signed by participating Douglas County fire departments, Colorado State Forest Service, Douglas County Board of County Commissioners, and the Douglas County Sheriff's Office.

This Plan acknowledges 23-30-310, C.R.S., otherwise known as the Wildfire Emergency Response Fund.

4. PURPOSE OF THE PLAN

This Annual Fire Operating Plan (AOP) is to set forth standard operating procedures, agreed procedures and responsibilities in order to implement cooperative wildfire management in Douglas County among the participating agencies of this agreement.

5. DEFINITIONS AND DESCRIPTIONS

A. Fire Management Responsibilities

The participating agencies in this agreement have wildland fire management responsibilities on certain lands in Douglas County.

Douglas County is responsible for private, state and county owned lands.

USDA Forest Service is responsible for USDA Forest Service lands.

Colorado State Forest Service is responsible for coordinating fire management actions and reimbursement procedures on Denver Water Board lands and in Denver Mountain Parks (Daniel's Park).

B. Mutual Aid Dispatch Areas by Dispatch Levels

The closest appropriate fire suppression and management resources will be dispatched to reported wildland fires.

C. Mutual Aid Move-up and Cover Facilities

Douglas County has taken steps to handle mutual aid responses and the coverage of response areas when resources are depleted. A comprehensive mutual-aid agreement is in effect between Douglas County and numerous other public safety agencies. This agreement provides for mutual response when available. In addition, Douglas County Dispatch has the ability to call in officials to monitor and recommend equipment coverage during emergencies.

D. Special Management Considerations

The U.S. Fish and Wildlife Service currently considers most areas that are within 300 feet of the 100-year flood plain to be potential habitat for the federally listed Preble's meadow jumping mouse. Necessary and reasonable emergency activities may be undertaken in these areas, however the Douglas County Planning Division and/or U.S. Fish and Wildlife Service should be notified of activity in these areas as soon as possible. The Douglas County Planning Division is responsible for coordinating with the U.S. Fish and Wildlife Service for Douglas County Government.

E. Responsibility for Non-Wildland Fire Emergencies

Non-wildland fire emergencies are the responsibility of the entity that is charged by statute or contract to fulfill obligations for mitigating that type of emergency.

F. Repair of Wildfire Suppression Damage

Each participating agency is responsible for repair and recovery of damage from wildland suppression activities. Modifications to this standard may be made through agreements at the time of fire close out to negotiate a different arrangement. Rehabilitation is not covered under EFF. However, the CSFS Line Officer may authorize it only when it is part of the Incident Action Plan during the EFF period.

6. FIRE MANAGEMENT RESOURCE LIST

See attachment A

7. PROTECTION AREA MAPS (see attachment B)

Jurisdictional Agency, Protection Unit, County boundary, Area of Responsibility.

Fire Protection facilities by agency and location.

Direct Protection Areas.

Mutual Aid Dispatch Areas.

Special Management Consideration Areas.

Date Effective.

8. FIRE READINESS

A. Fire Planning

1. PRE-SUPPRESSION ANALYSIS PLANS

Pre-attack plans have been developed for some subdivisions in Douglas County by the fire departments and/or fire districts that serve them. Comprehensive pre-suppression analysis plans for Douglas County have not been developed. Additionally, Denver Water Board has developed pre-suppression plans for areas where Denver Water has significant improved ownerships.

2. TRIGGER POINTS FOR INCREASE/DECREASE IN STAFFING/READINESS

The following staffing class ratings outline the recommended complement of personnel and equipment available for wildland fire suppression based on the fire danger rating for the day.

Staffing Class I	=	Low
Staffing Class II	=	Moderate
Staffing Class III	=	High
Staffing Class IV	=	Very High
Staffing Class V	=	Extreme
Red Flag Alert	=	Red Flag Alert

For a description of the fire danger rating system, see Section 11.

3. PREVENTION PLANS

See Section 11.

4. PRESCRIBED FIRE PLANS

Agencies planning prescribed fires must report these activities to Douglas County Government Emergency Management and Douglas County Sheriff's Office Dispatch. Notification should take place a minimum of 72 hours prior to the start of the intended activity. In addition, a description of the unit being burned and resources utilized should be provided.

Escaped wildland fires resulting from a prescribed fire, which was ignited by or at the direction of one of the parties to this agreement, shall be the responsible party for costs associated with suppression of the escaped wildland fire. The Douglas County Emergency Response Mutual Aid Agreement will outline suppression costs for the first twelve hours of an escaped wildland fire. Parties external to this agreement may take suppression action within its jurisdiction when lands are threatened by wildland fire. Such suppression action may be taken on its own initiative or at the request of the responsible party, if other agreements permit.

B. Wildfire Training Needs and Coordination

Each participating agency shall be responsible for the training of its own personnel. Participating agencies will advise each other of planned training sessions and issue invitations to participate when appropriate.

Safety of personnel involved in incidents is critical. Therefore, it is advised that all personnel who may be involved in wildland fire management, suppression, or control receive training in the accepted standard wildland curriculum including: Basic Fire Suppression (S-130), Basic Fire Behavior (S-190), and Standards for Survival. Successful completion of these courses plus an annual physical fitness test is the national accepted standard for personnel to be qualified as a Fire Fighter Type 2 under the National Interagency Incident Management System. Fire Fighter Type 2 qualifications are required for assignment outside of Douglas County.

Suppression forces operating on federal lands or working beyond the mutual aid period, must be equipped with appropriate personnel protective equipment (PPE) and certified with a minimum Fire Fighter Type 2 qualification (red carded), as specified in the current federal policy FSM 5130.3 and 5135.1.

Each agency will be responsible for providing personal protective equipment for their personnel to include fire resistant clothing, a hard hat with eye protection, gloves and fire shelter. However, participating agencies may assist by providing specified equipment needed for an individual incident upon request.

C. Inspection Schedules

All State Agreement resources will receive a thorough inspection for roadworthiness annually by the Colorado State Forest Service or its designee. Federal agencies retain the right to inspect all equipment, regardless of ownership, prior to entering into an Emergency Equipment Rental Agreement for the equipment.

All Colorado State Forest Service cooperator engines and equipment subject to use on interagency teams will be inspected to ensure use and roadworthiness.

All engines dispatched to incidents outside of Douglas County shall be thoroughly cleaned, including the undercarriage, so as to remove noxious weed seeds and prevent them from being transported to or from an assigned incident.

9. WILDFIRE SUPPRESSION PROCEDURES

A. ICS Use

The National Incident Management System's (NIMS) Incident Command System (ICS) will be utilized on all fires.

If a wildfire crosses or threatens jurisdictional boundaries and becomes a multi-agency fire, the responsible jurisdiction may request a Unified (shared) Command structure for any wildland fire situation. Where such Unified Command is not implemented, the responsible jurisdiction may reserve the right to designate an agency liaison capable of evaluating operational tactics and local resource availability. A Unified Command will be made up of representatives from the participating agencies involved in the incident. The purpose of a Unified Command will be to meet as a group and identify policies, objectives and strategy, resulting in one common set of objectives given to a single Operations Section Chief for tactical implementation. The Unified Command shall coordinate the release of all information to agencies and the media.

B. Detection Standards

Aerial detection flights should be coordinated through the Pueblo Interagency Dispatch Center when using federal resources.

C. Relationship with Local Mobilization Guide

If statewide mobilization procedures have been developed they can be found either with the Colorado Division of Homeland Security, Preparedness and Fire Safety or the Douglas County Emergency Operations Plan (also known as the Douglas County Incident Management Guidelines and Standards).

D. Notification About Fires

The participating agency responsible for wildland fire management must be notified of fires on or threatening lands within their jurisdiction as soon as the location has been determined by the arrival of initial attack forces.

For the purpose of this agreement, the designated dispatch centers in Douglas County responsible for dispatching fire management resources to a wildland fire are:

Douglas County Sheriff's Office Dispatch Center

Pueblo Interagency Dispatch Center

The appropriate dispatch center will immediately notify or dispatch the appropriate agency to respond to wildland fires.

In the Douglas County Sheriff's Office Dispatch Center, dispatch procedures and protocol from the United Fire Dispatch Authority will govern the response of fire departments and notification procedures of fire departments.

The Douglas County Sheriff's Office Dispatch Center shall be immediately notified of all wildland fire situations that occur within Douglas County, regardless of which jurisdiction has wildland fire management responsibility. The purpose of this procedure is to ensure that at least one point of contact is aware of wildland fire activity.

The Douglas County Dispatch Center will immediately notify the Colorado State Forest Service of all wildland fires in Douglas County, including all wildland fires that occur on Denver Water Board lands and properties owned by the City and County of Denver, including Daniel's Park. The Colorado State Forest Service Fire Duty Officer will make notification to the Denver Water Board regarding wildland fires threatening their lands. The Colorado State Forest Service Fire Duty Officer may request the Douglas County Dispatch Center notify the Denver Water Board representative. The Colorado State Forest Service will provide current contact information for Denver Water and the Colorado State Forest

Service Fire Duty Officer to the Douglas County Dispatch Center annually or whenever changes occur. The Fire Duty Officer will respond, at his/her discretion, to serve, as Denver's representative on the incident to facilitate reimbursement. The Colorado State Forest Service will not assume command of any fire unless requested by the County and accepted by the CSFS.

E. Establishment and Revision of Mutual Aid Dispatch Areas

In Douglas County, these reciprocal zones will be defined as intermingled federally and privately owned lands, plus all lands within one mile of accepted federal land boundary lines. These zones are for initial attack purposes only. A participating agency will assist another participating agency by implementing initial attack action on fires located within the reciprocal zone regardless of ownership.

Upon receiving a report of a fire near a reciprocal zone, the participating agency first receiving the report shall immediately notify the other participating agencies.

For fires within the reciprocal zones, each agency will assume responsibility for its own expenses during the **first twelve hours** from the time of initial dispatch of requested resources regardless of land management boundaries.

After the **first twelve hours** the participating agency responsible for the wildland fire is responsible for the costs for wildland fire management actions. Reimbursable costs are limited by the amount annually appropriated for this purpose.

Once location and land management status has been determined, the participating agency responsible will assume the position of Incident Command. If the fire is threatening the lands under the management of another participating agency, a Unified Command will be established.

Each participating agency with land involved in a reciprocal zone boundary situation shall make a reasonable effort to send resources and/or a qualified representative to a wildland fire burning in the reciprocal zone. If a participating agency does not send a representative to a wildland fire and the fire has been determined to be under that agency's management then the assisting agencies may request reimbursement for costs incurred from the responsible land management agency.

The Incident Commander or Unified Commanders designated by the participating agencies will determine when and which resources will be demobilized.

Only resources from entities specifically ordered by the participating agency will be considered for reimbursement. All resources not specifically authorized or ordered by a participating agency will be demobilized from the fire at the participating agency's discretion.

F. Initial Attack Dispatch Levels and Their Determination

The following response guide will be used to determine minimum reimbursement to a cooperating agency prior to the arrival of the benefiting agency. Reimbursement may be adjusted upward according to site-specific fire conditions after consultation among participating agencies.

- Staffing Class I & II.....1 engine, 3 persons / tools
- Staffing Class III.....1 engine, 5 persons / tools
- Staffing Class IV.....1 engine, 8 persons / tools
- Staffing Class V.....2 engines, or engine & tender, 12 persons / tools

Initial response agencies should dispatch the most appropriate resources for the location and conditions of the fire.

G. Dispatching and Resource Order Process

Mutual aid from local government fire suppression resources in other counties will be requested through Douglas County Dispatch. County requests for state and federal fire resources will be made only by those authorized to do so (listed below) through Pueblo Interagency Dispatch Center. The Colorado State Forest Service Fire Duty Officer should be notified of all requests made to the Pueblo Interagency Dispatch Center as soon as possible. Request for state agency assistance, including requests for CSFS engines on loan to county fire agencies, will be made through the Colorado State Forest Service Fire Duty Officer.

Agencies not participating in this agreement may not order resources on behalf of a participating agency. A participating agency shall not be responsible for costs or liability incurred by a non-participating agency that requests or directly orders resources from their source for a wildland fire regardless of where it is burning.

PERSONS AUTHORIZED TO ORDER STATE OR FEDERAL FIRE MANAGEMENT RESOURCES IN DOUGLAS COUNTY.

This includes but is not limited to: aircraft, hand crews, strike teams, incident management teams, heavy equipment, engines, personnel and reimbursable local government resources.

Douglas County Sheriff's Office

David A. Weaver	Sheriff
Tony G. Spurlock	Undersheriff
Michael D. Coleman	Bureau Chief
Holly Nicholson-Kluth	Bureau Chief

Douglas County Government Administration

Doug DeBord	County Administrator
Walter M. Maxwell	Commissioner
Melanie Worley	Commissioner
Steve Board	Commissioner

Douglas County Emergency Management

Jamie Moore	Emergency Management Director
Tim Johnson	Emergency Management Coordinator

Colorado State Forest Service

CSFS Personnel Fire Duty Officer on active fires being considered for Emergency Fire Fund (EFF) activation.

USDA Forest Service

USDA Forest Service appointed Incident Commander (only for USDA supervised fires).

H. Reinforcements and Support

Law enforcement agencies should provide traffic control during fire incidents. The Douglas County Sheriff’s Office will provide overall coordination of traffic control to ensure that traffic management plans are being executed effectively. This will expedite the routing of vehicles and personnel to and from major fires and to exclude unauthorized personnel from the fire area.

It will be the responsibility of the agency upon whose land the fire is burning to take law enforcement action. All wildland fire management agencies will gather and preserve information and evidence pertaining to the cause of the fire.

I. Move-up and Cover Locations and Procedures

Coverage procedures are determined by each participating agency and shall be coordinated and managed in accordance with in-house policies.

J. Interagency procurement, loaning, sharing, or exchanging and maintenance of facilities, equipment, and support services

Non-federal participants in this plan may purchase fire suppression supplies from General Services Administration through Colorado State Forest Service. Any other loaning, sharing, exchanging, or maintenance of facilities, equipment, or support services will be considered on a case-by-case basis and must be mutually agreed upon by the concerned parties.

K. Interagency Sharing of Communications Systems and Frequencies

All agencies signing this plan authorize the use of their radio frequencies by other agency personnel for emergency purposes only.

Whenever possible Cooperators wishing to communicate on USFS frequency’s should have Narrowband capabilities and be P25 compliant on the narrowband side.

All Federal wildland firefighting agencies (USFS / BLM / NPS/ USFWS) have narrow banded as of December 31, 2004. This means that federal VHF systems have converted to 12.5 kHz bandwidth. After that date, any system still operating wide-band, 25 kHz, will be operating on a Non Interference Basis (NIB). This means that if you receive radio interference from any authorized federal user, you do not have the right to request relief. It also means that if you cause radio interference to any authorized user, you will have adjust your operation stop the interference to include shutting down your radio. (From USFS National Office)

*Air to ground channels are managed by Pueblo Interagency Dispatch and may be used by the Incident Commander or designee as authorized for each incident by Pueblo Interagency Dispatch. See Attachment J- PSICC Radio Frequency List

AGENCY	CHANNEL	RECEIVE	RECEIVE TONE	TRANSMIT	TRANSMIT TONE
CSFS	Work channel	151.3400	n/a	151.3400	n/a
USFS	Pike Direct	*168.7250	n/a	168.7250	n/a
* Narrow Band	Pike Work	*163.1000	n/a	163.1000	n/a
	Devil Head Rpt	*168.7250	123.0	168.1250	156.7

	Pikes Peak Rpt	*168.7250	123.0	168.1250	167.9
	Badger Mtn Rpt	*168.7250	123.0	168.1250	136.5
	*Air to Ground	*172.4750	n/a	172.4750	n/a
	*Air to Ground2	Assigned by Rocky Mt. Coordination Center			
DOUGLAS COUNTY					
	FERN 1	154.280	n/a	154.280	n/a
	FERN 2	154.295	n/a	154.295	n/a
	FERN 3	154.265	n/a	154.265	n/a
	DISP 1	800 MHz	n/a	800 MHz	n/a
	DISP 2	800 MHz	n/a	800 MHz	n/a
	DEC	800 MHz	n/a	800 MHz	n/a
	MAC 1	800 MHz	n/a	800 MHz	n/a
	MAC 2	800 MHz	n/a	800 MHz	n/a
	MAC 3	800 MHz	n/a	800 MHz	n/a
	MAC 4	800 MHz	n/a	800 MHz	n/a
	MAC 21	800 MHz	N/a	800 MHz	N/a
	I-CALL	866.0125	156.7	821.0125	156.7
	I-TAC 1	866.5125	156.7	821.5125	156.7
	I-TAC 2	867.0125	156.7	822.0125	156.7
	I-TAC 3	867.5125	156.7	822.5125	156.7
	I-TAC 4	868.0125	156.7	823.0125	156.7
	Statewide TAC	868.7875	156.7	823.7875	156.7

L. Wildland Fire Situation Analysis

Federal agencies are required to complete a Wildland Fire Situation Analysis (WFSA in ATTACHMENT D) on all fires on federal land that escape initial attack. This procedure requires federal agency unit administrator participation.

CSFS requires an Emergency Fire Fund (EFF) Analysis Form (CSFS #108A attached as ATTACHMENT D) to be prepared on non-federal fires that have the potential to exceed

county control capabilities. The Sheriff should use this form to help determine if a fire might be eligible for EFF.

M. State Emergency Fire Fund (EFF)

1. INTENT

The Emergency Fire Fund (EFF) may be used to assist cooperating counties and the Denver Water Board. The fund will be used only for approved wildfire suppression and control activities. The State Forester, or his representative, is the only person authorized to approve and implement the fund.

Douglas County and the Denver Water Board are participants in the EFF Agreement with CSFS. As a participant to this agreement, the State agrees to come to the aid of Douglas County and the Denver Water Board should suppression resource needs exceed county capability.

When EFF is implemented, CSFS assumes responsibility and financial authority for all suppression activity until the fire is returned to county responsibility; however, the county must maintain a minimum level of participation after EFF is implemented as outlined in section 9.M.5.b.

2. FUNDING

The EFF is funded by an annual assessment of member counties. It is based on a formula that considers the number of forested acres protected and the valuation of private lands within the county.

3. ROLES

a. CSFS District Forester

Acts for State Forester in the absence of an assigned Incident Line Officer; assist Sheriff in completing EFF Analysis Form CSFS #108A) for each shift; prepare CSFS Fire Funding Request (CSFS #164); assure Incident Line Officer is aware of local situations and procedures.

b. Douglas County Sheriff

Prepare EFF Analysis Form (CSFS #108A) for potential EFF fires; sign Assumption of Fire Control Duty Form (CSFS #168) for fires that the State Forester approves for EFF; serve as county representative on Unified Command group.

c. Douglas County Commissioners

Review and approve Assumption of Fire Control Duty Form (CSFS #168) for fires that the State Forester approves for EFF.

4. UNIFIED COMMAND

All EFF fires will utilize a Unified Command consisting of, at a minimum, Douglas County's official representative and a line officer from the Colorado State Forest Service. If land administered by another agency is threatened or involved, that agency may be requested to provide an agency representative to the Unified Command.

5. EFF ACTIVATION

Implementation of the Emergency Fire Fund can be done only by the Colorado State Forester upon the recommendation of the local CSFS District Fire Duty Officer, following a request from the county. For this reason, it is important that the CSFS Fire Duty Officer be notified immediately of all wildland fires within the county. Should the fire surpass, or threaten to surpass, the ability of county resources to contain it, EFF implementation can occur only with a CSFS representative on scene.

a. CSFS Forms (ATTACHMENT D)

* 108A prepared by Douglas County Sheriff and CSFS District Forester.

* 168 prepared by CSFS District Forester with input from Douglas County Sheriff.

* WFSA prepared by Incident Line Officer with input from District Forester and Sheriff.

b. County Responsibility

The minimum Douglas County commitment for an ongoing EFF fire will be:

- Request those forces from the Fire Protection District within which the incident is occurring, while still providing a minimal level of response for other, new incidents with that district.

- Request those mutual aid forces that are normally used by the Fire Protection District within which the incident is occurring, without jeopardizing the ability of the assisting agencies to mount a reasonable response within their own jurisdiction.

- Provide Douglas County equipment as may be available and as mutually agreed upon between Douglas County and the CSFS Line Officer, given the specific conditions and needs of the incident and to support or assist an assigned Incident Management Team (IMT).

- Provide traffic control and law enforcement as necessary. It is understood that if the tactics of a given incident do not require this resource commitment, it will not be required on scene.

c. Denver Water Board Responsibility

Personnel and equipment from the local or other water districts that are qualified for wildfire suppression duties while still providing a minimal level of service to the local or other district operations. This may include resources such as road maintenance, water supply, transportation, communications, facilities, first aid, and other Denver Water Board-owned equipment and personnel as may be available and as mutually agreed upon between the county, Denver Water Board, and the CSFS Line Officer, given the specific conditions and needs of the incident.

d. EFF/CSFS Responsibility

CSFS will provide a District Representative and an Incident Line Officer for each EFF fire. CSFS will act as the fund administrator for all EFF fires.

6. EFF DEACTIVATION

CSFS will transfer control of an EFF fire back to Douglas County when fire spread is contained, the Line Officer's objectives have been met, and a written plan has been prepared for the next operational period.

a. Mop-up and patrol

Douglas County will be responsible for fire monitoring and mop-up after an EFF fire has been transferred back to Douglas County from CSFS.

b. Reclamation

EFF monies may pay for the costs for constructing water bars and other erosion control mechanisms, provided this work is accomplished during fire suppression and mop-up activities during the EFF period and is supported by the Incident Management Team charged with management responsibility for the fire. Reseeding of the fireline is not authorized under EFF. Any reclamation work must be funded by individual landowners.

N. Dispatch Centers or Other Incident Support Facilities

The Pueblo Interagency Dispatch Center (PDC) will be the point of contact for all fires involving USDA Forest Service lands. In addition, PDC has also agreed to be the contact point if Colorado State Forest Service assistance is requested for wildland fires on state and private property. Pueblo Interagency Dispatch may be contacted at 719-553-1600.

O. Post-incident Action Analysis

Analysis of incidents will be conducted at a level commensurate with the complexity of the incident.

P. Out-of-Jurisdiction Assignments

1. Standards

Standards and Procedures for mutual aid assignments are outlined in section 9.E of this plan and in the Douglas County Emergency Operations Plan (also known as the Douglas County Incident Management Guidelines and Standards).

Non-federal personnel ordered as a single resource must be prepared to cover incidental expenses with funds or credit cards. Reimbursements will be made through the CSFS, based upon invoicing and supporting documentation.

Prior to being dispatched on interagency assignments, equipment and staffing must meet or exceed the current Rocky Mountain Area (RMA) standards found in the RMA Mobilization Guide (75.1) to qualify for incident use or full reimbursement. RMA has additional staffing requirements above NWCG standards for engine types 2-7. Staffing below RMA standards will result in reduction of reimbursement by appropriate personnel rate for missing personnel.

2. Procedures

Equipment and personnel will be dispatched only when a current Cooperative Resource Rate Form is on file with CSFS and availability status is current with Pueblo Interagency Dispatch Center.

Pueblo Interagency Dispatch Center may be able to obtain lowboy transports for equipment when requested for long distance travel assignments. Unavailability of lowboy transports may require driving the apparatus to fulfill assignment requests.

3. Participation on National, Regional, Zone and Local IMT's

In keeping with the concept of cooperative fire management, federal and non-federal personnel are encouraged to support and join Incident Management Teams (IMT's) or Incident Management Groups (IMG's) within and outside the PIDC.

Federal and non-federal personnel participating on National, Regional, Zone and Local IMT's or IMG's will be ordered through and tracked by their respective dispatch organizations.

Request for assistance outside of mutual aid areas described in this agreement must be through the appropriate dispatch centers for tracking and reimbursement. Personnel responding to a non-mutual aid incident must have been dispatched by their jurisdiction and have a resource order.

10. AVIATION PROCEDURES

A. Aviation Map and Narrative

Federal agencies have mapped aviation issues in their fire management action plans.

- 1. HAZARDS**
- 2. SENSITIVE ZONES (urban-interface, aquatic, wilderness, etc.)**
- 3. HELISPOTS, DIP SITES**
- 4. AUTOMATIC DISPATCH ZONES (tied to preparedness planning)**
- 5. DETECTION ROUTES**
- 6. FOAM/RETARDANT RESTRICTION AREAS**

B. Flight Following/Frequency Management

There is a frequency plan developed for Colorado that identifies frequencies for specific areas of Colorado. This plan is located at Pueblo Interagency Dispatch center.

PIDC will flight follow for aircraft ordered through them. If radio communication problems develop, PIDC will coordinate with adjacent dispatch centers to provide flight following.

C. Tactical and Support Aircraft.

Pre-positioning of Single Engine Air Tankers (SEAT) will be requested when the following criteria is met:

- When the fire danger rating is predicted to be Staffing Class IV or greater, based upon readings at an official "RAWS" (Remote Automatic Weather Station); and
- When five (5) wildland ignitions have been reported within the previous 24 hour period in the following mountain shrub, ponderosa pine, or mixed conifer; or
- When a single major wildland incident has occurred in these fuel types in excess of 10 acres within the previous 24 hours; or

- When a major holiday or other significant event is anticipated to bring numerous people into the interface and forest areas; or
- Some other combination of events and circumstances that create a situation warranting such action as agreed upon by Douglas County Emergency Management, USFS, and CSFS Franktown District. Such things as lightning activity or lightning ignitions, other extreme or unique weather occurrences, heavy air tankers not located in Colorado, etc., should be considered.

AIRCRAFT REQUEST PROCEDURES

Movement of, and pre-positioning of aircraft shall be at Colorado State Forest Service expense subject to budget depletion.

When pre-positioning criteria have been met, the following procedures will be utilized to request aircraft.

1. An official representative from Douglas County Emergency Management and the Colorado State Forest Service shall jointly agree upon their request. The agreement shall consist of the specific criteria met that is prompting the request, the pre-position air base and the anticipated length of service.
2. Colorado State Forest Service Franktown District will forward this information to the CSFS State Office or Fire Duty Officer (FDO) for action.
3. The State FDO will respond as soon as possible to the Colorado State Forest Service Franktown District with the disposition of the request and aircraft type, capabilities, tail number, call signs, ETA to pre-position location, pilot name, pilot contact procedures if pre-positioning is approved.
4. The Colorado State Forest Service will notify Douglas County Emergency Management and the Pueblo Interagency Dispatch Center of request for pre-positioned airtanker movement. Actual order will be placed with PIDC.

The procedure for dispatching the single engine air tanker to a wildland fire incident is the same as that for ordering aircraft. (See section 10.)

D. Fixed Wing Base Management

The Colorado State Forest Service Fire Duty Officer and Douglas County Emergency Management will jointly arrange for ground support and fixed wing base management.

E. Single-Engine Tanker Bases

Potential bases include:

- Air Force Academy
- Boulder County Airport
- Fremont County Airport
- Jefferson County Airport
- Pueblo Municipal Airport

F. Leadplane / Air Attack Activation

The determination to use a leadplane or air attack on an incident will be made by the interagency dispatch center that processes and implements the aviation resource request.

A lead plane, air attack supervisor or Air Tanker Coordinator will accompany air resources on the following missions:

- When two or more air tankers will be over the fire at the same time.
- If the air tanker pilot is not Initial Attack rated through the federal system or the wildland fire is burning in an urban wildland interface area.
- Whenever any air tanker is operating within thirty minutes of sunset or sunrise at the nearest designated air tanker base.

Air tankers are to be dispatched to arrive over a fire not earlier than thirty minutes after official sunrise and not later than thirty minutes before official sunset.

G. Aviation Requests And Operations

1. Initial Attack

Aircraft identified in section 6, may be available as initial attack resources. Aircraft are typically managed through a national contract; therefore orders may be filled with aircraft from out of state. Aircraft located out of state may incur additional costs at the expense of the requesting agency for transportation to and from the fire.

Requests for aviation resources are managed in accordance with Section 9.

2. Boundary Fires

See Section 9, paragraph E.

3. Wildland Urban Interface

See Section 9.

4. Mutual Aid Procedures

See Section 9.

5. Air Space Restrictions

If an aircraft management issue poses a hazard for fire air operations, the Incident Commander may request an air space restriction. The Pueblo Interagency Dispatch Center or Douglas County Sheriff's Office Dispatch will facilitate this request through the FAA.

H. Inspection Schedules

Fire suppression aircraft are inspected annually and certified for their capabilities by either the USDA, Forest Service or the Office of Aircraft Services.

I. Aviation Dispatch Procedures

The following information should be relayed to the dispatch center processing a request for aircraft:

Incident Name

Latitude and longitude of incident

Name of ground contact

Hazards located within the area (power lines, towers, other aircraft in the area)

Radio frequencies or talkgroups for air to ground communication

Specific type of resource being requested

Single Engine Air Tanker (SEAT) Dispatch Criteria

A SEAT will be dispatched only to confirmed wildland fires. The SEAT will not be dispatched to smoke reports.

There must be personnel on the ground at the site of the fire with capability to communicate directly with the pilot on the frequency assigned by Pueblo Interagency Dispatch Center.

The use of a SEAT will be given priority to wildland fires burning in the urban wildland interface areas.

J. *Wildfire Emergency Response Fund (WERF)*

This fund is intended to reimburse the local/county non-federal agency for the first air resource per the WERF guidelines.

The Wildfire Emergency Response Fund (WERF) was created to provide funding or reimbursement for the first aerial tanker flight or first hour rotor time for a helicopter when ordered at the request of any county sheriff, municipal fire department, or fire protection district. Applies to initial attack only.

11. FIRE PREVENTION -

A. *General Cooperative Activities*

Agencies participating in the Annual Fire Operating Plan for Douglas County will coordinate fire prevention activities through the Douglas County Fire Chiefs Association, Pikes Peak Wildfire Prevention Partners and other venues.

B. *Information and Education*

1. Fire Danger Information

Please refer to the Douglas County Wildland Fire Management Plan.

2. Joint or Single Agency Press Releases

Fire Danger Information: News releases on fire danger and prescribed burning will be coordinated and, when practical, issued jointly to newspaper, radio and television media by the participating agencies. This effort will reduce public confusion and direct attention to fire danger at all elevations and ownerships.

3. Smoky Bear Program

Smoky Bear prevention programs are occasionally presented to public groups in Douglas County. The Colorado State Forest Service coordinates this program.

4. Red Flag Operations

See Section 9.

5. Firewise and Firewise Communities Program

The National Firewise organization conducts Firewise Communities Workshops throughout the United States. These workshops deal with strategies for protecting homes and communities from destruction by wildland fires. The main objectives of the workshop are:

1. To improve safety in the wildland/urban interface by sharing responsibility
2. To create and nurture local partnerships
3. To integrate Firewise concepts into community and disaster mitigation planning

For more information refer to the website: www.firewise.org/communities

C. Engineering

1. LAND USE PLANNING (WILDLAND URBAN INTERFACE)

Douglas County zoning requires a hazard assessment on all proposed subdivisions. Douglas County has adopted a version of NFPA 299 to address development in the urban interface/intermix. Douglas County has also adopted a standard for water supplies for rural fire fighting into the building code.

2. DEFENSIBLE SPACE AND FUELS TREATMENT

Douglas County enforces a minimum defensible zone around residential structures under new construction. Minimum defensible zones are determined in conjunction with a 1991 version of NFPA 299 as amended and adopted by Douglas County. Defensible space work needs to be completed to receive a Certificate of Occupancy. All building permits in a wildfire hazard area are subject to defensible space requirements.

3. RAILROADS AND UTILITIES

No special considerations addressed.

D. Enforcement

1. Issuing Open Burning and Special Event Permits

Fire protection districts or established fire departments issue open area burning permits based on the safety risks of such a fire. Douglas County Public Works issues open area burning permits for areas outside of a fire protection district and not on USDA Forest Service lands or when fire restrictions are in effect. The USDA Forest Service has established regulations for open area burning on USDA Forest Service lands.

The Colorado Department of Public Health and Environment issues open burning permits for all areas of Douglas County concerning the environmental and health effects of open burning.

2. Restrictions and Closures

The Board of County Commissioners, the State of Colorado and the USDA Forest Service have the authority to issue fire restrictions on lands within Douglas County. Due to the regional nature of fire restrictions and the benefit of working as a coordinated region of counties and land management agencies, fire restrictions must be viewed as comprehensive, coordinated effort.

The Board of Directors of the Pueblo Interagency Dispatch Center will make recommendations on fire restrictions for the area served by the Pueblo Interagency Dispatch Center. Each agency will then determine whether or not adopt the recommendation. Fire restriction levels are generally fall into two different levels or stages, but may be slightly different in accordance with governmental regulations:

Stage I

Fires are only permitted at designated campgrounds or picnic areas and are contained in a fire pit or metal fire grate designed for campfires. Adults must supervise fires and flame lengths must be monitored. The sale and use of fireworks is prohibited. Charcoal grilling and the use of gas fueled stoves and appliances are permitted.

Stage II

Fires are not permitted at campground or picnic areas. Charcoal grilling is prohibited. The sale and use of fireworks is prohibited. The use of gas fueled stoves and appliances are permitted.

3. FIRE INVESTIGATIONS

Each participating agency shall have responsibility for the investigation of fires.

All fires will be investigated to determine cause, responsible party, time of ignition, and all other pertinent information relating to the cause of the fire. Although an assisting agency may have a fire extinguished upon arrival of the participating agency's forces, the participating agency should discuss the fire with the assisting agency to aid in the investigation and take steps to:

- * Preserve the point of origin
- * Preserve all clues that may relate to the cause
- * Fire cause determination is needed for EFF incidents and required for FEMA incidents.
- Note all suspicious vehicle traffic in the area and note vehicle descriptions and license numbers.

12. FUEL MANAGEMENT AND PRESCRIBED FIRE CONSIDERATIONS

Any agency planning prescribed fires will report all prescribed fire activities to the Douglas County Sheriff's Office. A copy of the prescribed fire plan will be provided to Douglas County

Emergency Management. In addition, Douglas County Dispatch maintains a current record of all authorized burning activities on private land in unincorporated Douglas County.

Wildfires resulting from escaped prescribed fires ignited by a party to this Agreement on lands it manages, shall be the responsibility of that party. The party responsible for the prescribed fire will reimburse other parties to this Agreement consistent with the terms and conditions contained herein for costs incurred in suppression of such fires.

If parties to this Agreement conduct a cooperative prescribed fire, details covering cost sharing, reimbursement, and responsibility for suppression costs, should it escape, shall be agreed upon and documented in the burn plan.

13. COST REIMBURSEMENTS

A. Non-Reimbursable Items

May be addressed in future plans.

B. Reimbursable Items

Suppression costs will be determined on an operational period basis utilizing the Incident Action Plan (IAP), when a fire is accepted by the State as an EFF incident.

The Colorado State Forest Service, Franktown District Office will reimburse cooperators.

Participating agencies agree to consolidate all bills and send to the Colorado State Forest Service, Franktown District office within thirty days after the incident.

When called upon and available for an assignment, the participating agencies agree to a commitment up to 14 days excluding travel. Any desire by personnel or their department to rotate manpower or equipment before the end of these agreed upon time periods without prior approval from the Incident Commander or designee will be at the agency's expense.

Equipment use will be documented on an Emergency Equipment Shift Ticket (OF 297).

Any equipment that does not pass a pre-use inspection performed by the benefiting agency after arriving at an incident will be rejected, and the Cooperator will not be compensated for any time or mileage incurred.

Personnel time for single resources will be documented on a Crew Time Report (SF-261) or other document as specified in the Annual Operating Plan, and recorded on an Emergency Firefighter Time Report by the Incident Commander or designee.

Each participating agency using the Cooperative Resource Rate Form or participating at an AD rate will provide workers compensation insurance for personnel.

Temporary emergency hires or casuals shall be paid at the current Administratively Determined (AD) Fire Fighter rates (ATTACHMENT E). It is required that a Crew Time Report (Standard Form 261) be used to record hours for personnel on an incident. A USDA/USDI Fire Time Report (Standard Form 288) will be used for reimbursement. The hiring unit will provide each casual hire the opportunity to complete Federal & State income tax forms, provide each casual hire an information sheet on income tax withholding and forward these forms to the servicing Department of Interior Administrative Deciding Officer in a timely manner.

It is the individual firefighter's responsibility to ensure that the appropriate forms are completed and presented to the Incident Finance Section or next appropriate office. Finance officials are

not tax consultants and shall not advise casual hires about tax laws or personal income tax liability.

Resources used must be equipped according to current Fireline Handbook standards. Each resource will have an officer in charge who is who is knowledgeable about current interagency fire reimbursement procedures.

Payment for Colorado State Forest Service state agreement fire vehicles on loan to a county or fire protection district, which are used on reimbursable federal fires, must be made to the Colorado State Forest Service. However, the operator should document fuel and oil costs and submit a documented invoice to the CSFS District Office for reimbursement.

Payment will be made to CSFS for State engines assigned to a cooperator and staffed by the cooperator at the current rate (ATTACHMENT E). CSFS will reimburse cooperators all documented costs for fuel and oil for State engines assigned to reimbursable incidents.

The cooperator will maintain in force liability insurance coverage for each vehicle in amounts equal to or greater than \$150,000 each person/\$400,000 any one occurrence, or such higher amount as may be specified in the Colorado Governmental Immunity Act, 1973 C.R.S., 24-10-101, et. seq., as amended, for such acts as to which government immunity has been partially waived by statute or by resolution of the district, if any. Such insurance shall be obtained from a company licensed to do business in the state of Colorado or through statutorily approved self-insured program.

Damage claims will be made directly with the incident at the time they occurred and prior to demobilization.

Use rates for engines and specialized equipment are pre-determined on a Cooperative Resource Rate Form (CRFF). Rates must be approved by the Colorado State Forest Service prior to use.

C. Current Cooperator Incident Reimbursement Guidelines

See Attachment

D. Wildfire Prevention

See Section 11.

E. Wildfire Readiness

See Section 8.

F. Wildfire Suppression

The established operational periods listed in the Incident Action Plan (IAP) will be used as a basis for determining costs associated with wildland fire management.

1. Dispatching

Cooperators wishing to make their equipment and/or personnel available on interagency assignments must make themselves available in the ROSS System. Login passwords to ROSS for equipment status must be received from the Colorado Division of Fire Safety at 720-852-6735. Login passwords to ROSS for personnel status must be received from the Pueblo Interagency Dispatch Center at 719-553-1600. Status should be updated 9:00 A.M. each Monday with availability or follow other procedures as set forth by PIDC and Division of Fire Safety.

2. Initial Attack

Any costs incurred by assisting agencies, beyond the **first twelve hours**, whose personnel and/or equipment is requested by the participating agency, shall be considered reimbursable except as noted under reciprocal fire protection zones.

3. Mutual Aid

An agency that provides a reasonable initial attack response within another participating agency's jurisdiction, due to that agency's inability to respond may, at its discretion, request reimbursement from the participating agency with jurisdiction over the fire.

4. Reinforcements

Reinforcements will be utilized in accordance with each participating agency's regulations and applicable laws.

5. Aviation

Reimbursement for use of aircraft and related aircraft support will be made only when prior approval for use on each fire has been obtained from the responsible official of the participating agency as listed in Section 15.

6. Cost Share Plan

When a wildland fire occurs on lands of more than one participating agency and costs are incurred, one of the following options may be used to determine reimbursable costs for the agencies involved:

1. Each agency assumes its own costs.
2. Costs are shared based upon ownership and acreage percentages.
3. Another mutually agreed upon method by agency representatives. This shall be in writing and done as soon as possible after determining that multiple ownerships are involved.
4. EFF Fires- When a fire is accepted by the State as an EFF incident the Cost Share Principles agreed to by State and Federal Agencies will apply. See Attachment L.

This cost sharing may be established prior to the fire season as part of the operating plan review and added as a separate appendix, or agreed upon by both parties within a reasonable time after an incident.

7. Resource Use Rates

See Attachment E for rates.

14. GENERAL PROCEDURES

A. Periodic Program Reviews

See Section 14 B.

B. Annual Updating of Plans

This Annual Operating Plan should be reviewed annually and must be executed prior to May 1 of each year. The Colorado State Forest Service is responsible for setting the annual date of the meeting.

This Plan becomes effective on the date signed by the last agency and shall remain in effect until jointly terminated in writing by all participating agencies.

Colorado State Forest Service will coordinate approvals and distribute this plan to all participating agencies. Non-participating agencies that wish to review a copy of this plan should contact the Colorado State Forest Service.

If no changes are made, a statement letter with signatures of all parties to the AOP will be distributed.

C. Changes During Year (due to budget cuts or supplemental funding)

Changes to this plan require the signature of all participating agencies. CSFS will coordinate approvals and distribute official changes of the plan to all participating agencies.

D. Resolution of Disputes Procedure

Any and all disputes will be resolved by a meeting of all participating agencies signatory to this agreement. When a participating agency to this plan has a dispute, that agency should notify, in writing, the Colorado State Forest Service, Franktown District office (CSFS) of the specific concerns involved in the dispute. The CSFS office will schedule a meeting of all the participating agencies to resolve the dispute.

At the request of any participating agency a disinterested mediator, acceptable to all parties, shall be obtained for resolution of a dispute when situations warrant.

E. Duration of Agreement

The term of this Agreement shall commence for each participating agency upon the date of their signatures below and shall continue for one years, unless terminated earlier. Any participating agency shall have the right to terminate this Agreement upon thirty days written notice to all parties.

15. DIRECTORY OF AUTHORIZED AGENCY REPRESENTATIVES

A. Bureau of Land Management

No BLM lands in Douglas County

B. Colorado State Forest Service

Business: 303-660-9625 Fax: 303-688-2919

Fire Duty Officer Pager: 303-851-5606

Mike Bahm: Pager: 303-855-6522; (H) 303-660-9230; cellular phone 303-726-7292

Fire Duty Officer Schedule for 2006 to be completed and distributed to the participating agencies prior to May 1st of each year.

Diana Selby: Cell: 303-550-8356, Pager: 303-851-7479

C. USDA Forest Service

Pueblo Interagency Dispatch Center: 719-553-1600 (24-hour)

Pikes Peak Ranger District: 719-636-1602

South Platte Ranger District 303-275-5610

D. Bureau of Indian Affairs

No lands in Douglas County

E. National Park Service

No lands in Douglas County

F. Fish and Wildlife Service

No lands in Douglas County

G. Douglas County

Board of County Commissioners: 303-660-7401

Sheriff's Office Dispatch: 303-660-7500

Douglas County Emergency Management: 303-660-7589

Douglas County Planning Division: 303-660-7560

H. Fire Departments

Fire departments are covered under a separate agreement. Douglas County Dispatch can contact or dispatch fire departments that operate in Douglas County.

I. Denver Water Board

Emergency Dispatch: 303-628-6801

Kevin Keefe: 303-628-6355 Fax: 303-628-6853 Pager: 303-903-9176 Mobile: 303-947-8456

Roxborough Park Foundation
CWPP Treatment Areas

Prepared by Keith Worley, Consulting Forester
19-Nov-06

Project Number	Description of area	Estimated Cost	Admin.	Comments
2006 Projects				
1-1	Rox. Dr.-Canyon Entrance	\$ 4,960	\$ 350	Project bid, 2006
1-2	Rox. Dr.- Hawthorn to Foxcroft	\$ 12,160	\$ 1,000	Project bid, 2006
1-3	EEE to Haney Park	\$ 6,460	\$ 350	Project bid, 2006
1-4	Rox. Dr.- Inside Curve, S. Ponderosa to Sumac	\$ 1,990	\$ 300	Project bid, 2006
1-5	Rox. Dr.- Hawthorn to PA-6, Trail Clearing	\$ 500		Cutting by volunteers, cost is slash trmt.
	Subtotal	\$ 26,070	\$ 2,000	
Note: 2-XX projects tentatively scheduled for 2007				
2-1	Rox. Dr.- Hawthorn, north to Harebell	\$ 6,600	\$ 660	Hand work
2-2	Rox. Dr.- Foxcroft to Ponderosa Run	\$ 8,800	\$ 880	Combination of mastication and hand work
2-3	Rox. Dr.- East side, S. Ponderosa to Sumac	\$ 3,000	\$ 600	Hand work only (Rox. State Park land)
2-4	Rox. Dr.- Bright Water Trail to Choke Cherry Trail	\$ 2,500	\$ 250	Hand work and mowing
2-5	Rox. Dr.- Snow Cloud to red rocks O.S. (open space)	\$ 2,800	\$ 280	Hand work
2-6	Rox. Dr.- Entrance way, Southeast side	\$ 6,000	\$ 600	Hand work
2-7	Red Fern Court O.S. Tract/Easement	\$ 2,500	\$ 250	Hand work
2-8, A-C	Rox. Dr.- West side, Condor Run to Harebell	\$ 6,800	\$ 680	Hand work
2-9	Thunder Run/Sumac Safety Zone	\$ 4,500	\$ 450	Mastication and hand work
2-10 (Note 8)	Broken Bow/Sundance Trail, Fuel break	\$ 4,500	\$ 450	Mastication (ownership?)
2-11	Rox. Dr.- East side, Buffalo Run to Rox. Dr. North	\$ 6,800	\$ 720	Hand work
2-12	Sleeping Bear, Fuel continuity	\$ 2,500	\$ 250	Hand work and mowing
2-13	Rox. Dr. North, Fuel continuity	\$ 2,800	\$ 280	Hand work and mowing
2-14	Rox. Dr. North, Powerline easement	\$ 3,500	\$ 350	Hand work and mowing
2-15	Hawk's Nest O.S., Connection to Ravenna	\$ 1,200	\$ 120	Hand work
	Subtotal	\$ 64,800	\$ 6,820	

North Compartment Projects				
N-1-1	SE Corner, Private Property accessed from Puma	\$ 4,500	\$ 450	Mowing and hand work
N-2-3	S. of Wildcat, Private Property	\$ 6,500	\$ 650	Mowing and hand work
N-3-3	W. of Lookout, Mesa and Yucca, Ravenna	\$ 2,500	\$ 250	Mowing and hand work
N-4-2	Ravine at Wildcat, Private	\$ 2,800	\$ 280	Hand work
N-5-3	Hawks Nest canyon, South part, Private	\$ 9,500	\$ 950	Hand work
N-6-3	Hawks Nest canyon, middle part, Private	\$ 2,800	\$ 280	Hand work
N-7-3	Hawks Nest canyon, North part, Private	\$ 8,500	\$ 850	Hand work
N-8-4	School Land NE of Sleeping Bear	\$ 4,500	\$ 450	Mowing and hand work
N-9-4	E. of Sleeping Bear, connect to rocks, Ravenna	\$ 5,800	\$ 580	Hand work
N-10-2	E. of Arroyo, connect to rocks, Ravenna	\$ 5,800	\$ 580	Hand work
	Subtotal	\$ 53,200	\$ 5,320	
East Compartment Projects				
E-1-1	Trailhead at Fairway Vistas, COS	\$ 2,500	\$ 250	Hand work
E-2-2	NW of Foxpaw, Private, Ravenna	\$ 5,200	\$ 520	Hand work
E-3-3	Ravine E. of Foxpaw, COS	\$ 8,800	\$ 880	Hand work
E-4-4	Hogback E. of Chokecherry Way, Rox. Vil. MD	\$ 4,500	\$ 450	Mowing and hand work
E-5-4	Hogback E. of Old Ranch Trail, Rox Vil MD	\$ 12,000	\$ 1,200	Mowing and hand work
E-6-1	COS west of Big Horn Trail along path	\$ 15,000	\$ 1,500	Hand work
E-7-4	Hogback E. of Spotted Fawn, Private	\$ 3,500	\$ 350	Mowing and hand work
	Subtotal	\$ 51,500	\$ 5,150	
West Compartment Projects				
W-1-1	West of Fargo and N. of Multi-family, COS	\$ 8,500	\$ 850	Mowing and hand work
W-2-1	East of Multi-Family, COS	\$ 2,500	\$ 250	Hand work
W-3-2	COS West of Condor and Pump Station	\$ 6,000	\$ 600	Mastication and hand work
W-4-2	COS SW of Condor	\$ 7,800	\$ 780	Mastication and hand work
W-5-2	COS West of Warrior Run	\$ 18,100	\$ 1,810	Mastication and hand work
W-6-2	COS West of Buffalo Run	\$ 22,300	\$ 2,230	Mastication and hand work
W-7-2	COS West of Moss Rock, Rox MD access at tank	\$ 6,800	\$ 680	Mastication and hand work
W-8-2	Lot at end of Buffalo Run, Private	\$ 3,500	\$ 350	Hand work
	Subtotal	\$ 75,500	\$ 7,550	
South Compartment Projects				
S-1-2	COS West of Harebell	\$ 7,500	\$ 750	Mastication and hand work
S-2-2	COS west of Antler Run	\$ 4,800	\$ 480	Mastication and hand work
S-3-1	Hawthorn Canyon, Private	\$ 6,000	\$ 600	Hand work
S-4-2	COS west of Black Squirrel	\$ 18,000	\$ 1,800	Mastication and hand work
S-5-2	Park Easement Track	\$ 6,000	\$ 600	Mastication and hand work
S-6-2	West of Foxcroft, Private	\$ 15,000	\$ 1,500	Mastication and hand work
S-7-2	West of Ponderosa, Private	\$ 18,000	\$ 1,800	Mastication and hand work
S-8-1	Water Tank Site	\$ 10,200	\$ 1,020	Hand work
S-9-2	South of Thunder Run, Private and Park	\$ 4,500	\$ 450	Hand work
S-10-1	State Park Access to Park Road	\$ 11,500	\$ 1,150	Mastication and hand work
S-11-1	Roxborough Dr., East Side	\$ 5,600	\$ 560	Mastication and hand work
S-12-2	Broken Bow- Sundance right-of-way	\$ 4,500	\$ 450	Mastication and hand work
	Subtotal	\$ 111,600	\$ 11,160	
	Totals	\$ 382,670	\$ 38,000	

Other Items				
	Upgrades to Street Signs			
	Annual maintenance of treated areas			
	Posting of Refuge areas and egress routes			
	Annual dissemination of egress information			
	Classes for residents			
	CWPP updating/tracking/monitoring			

Notes:

1. Mastication is the process utilizing skid-steer mounted brush grinder.
2. Hand work involves thinning, pruning and dead material removal.
3. Mowing to be combination of machine and hand work.
4. Administration is calculated at 10%, with some project areas requiring more time to deal with individual, adjacent property owners.
5. Project numbers correspond to "second year" and priority.
6. Project areas in prairie areas intended to restore shrub/brush spacing and break up fuel continuity.
7. Priorities for 2007 are Transportation Corridors and Safety Zones.
8. Deferred to 2008 or future years depending on funding.

2-15

North
Compartment
2007

and
Future Projects

N-7

2-13

N-8

N-8

2-12

2-14

N-5

North

N-3

N-9

N-2

N-1

2-5

N-10

ROCK WREN

HAWKS NEST TRL

ELK REST RUN

HERMITAGE RUN

YUCCA

LONE PINE

SLEEPING BEAR TRL

MESA RUN

FIREHORN

ROXBOROUGH DR A BIRTH

LOOKOUT RUN

WILDCAT

TWIN CUBS

IR ROYO RUN

PUMA TRL

FARGO TRL

BUCKSKIN DR

BEAVER RUN

SNOW CLOUD TRL

FAIRWAY VISTAS RD



East Compartment
2007

(with 2006 projects)
and
Future Projects

East

West

Roxborough
State Park

E-3

E-2

E-4

E-1

2-4

E-5

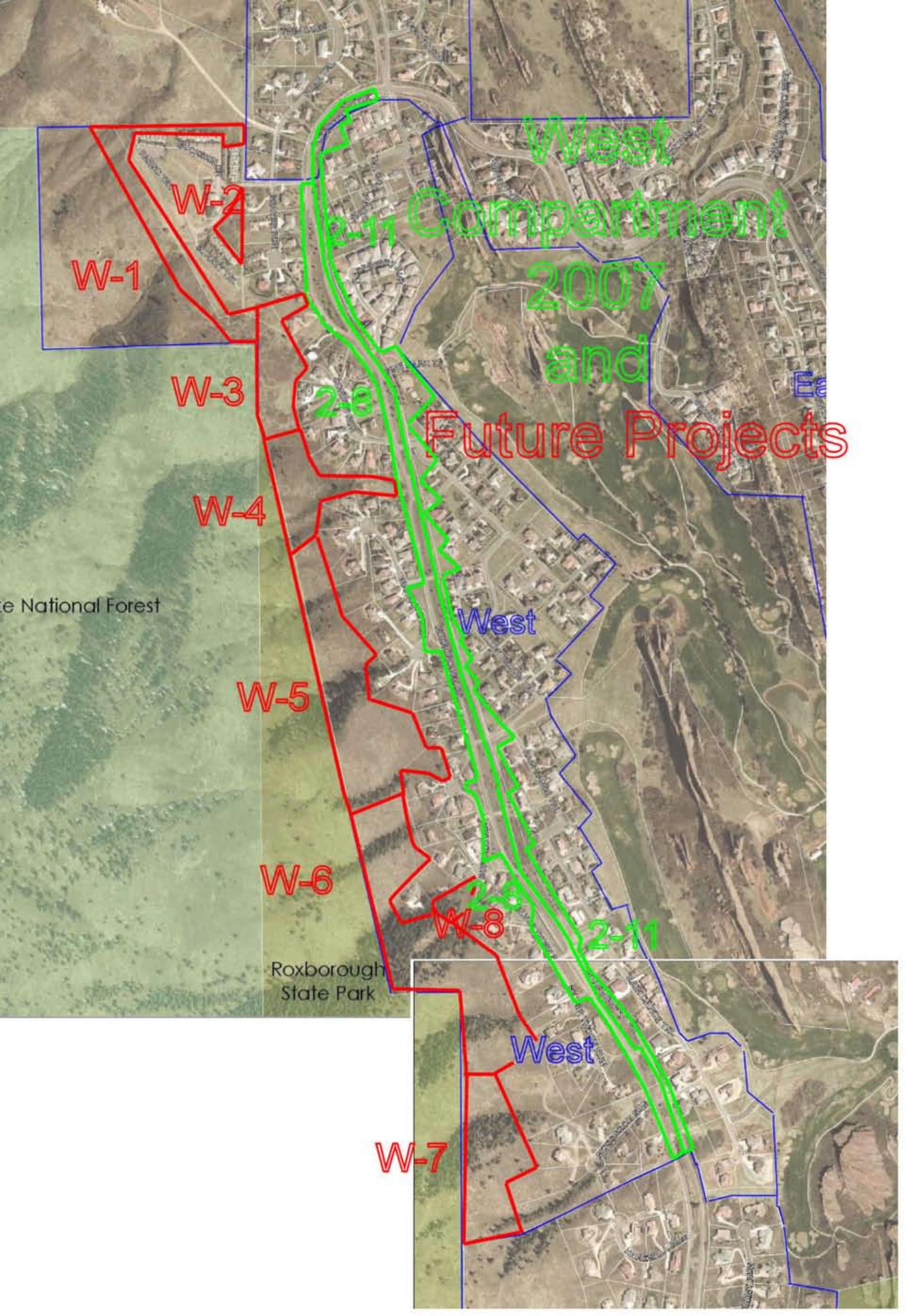
E-6

E-7

1-1

2-6

1-3



W-1

W-2

W-3

W-4

W-5

W-6

W-8

W-7

West
Compartment
2007
and
Future Projects

National Forest

Roxborough
State Park

West

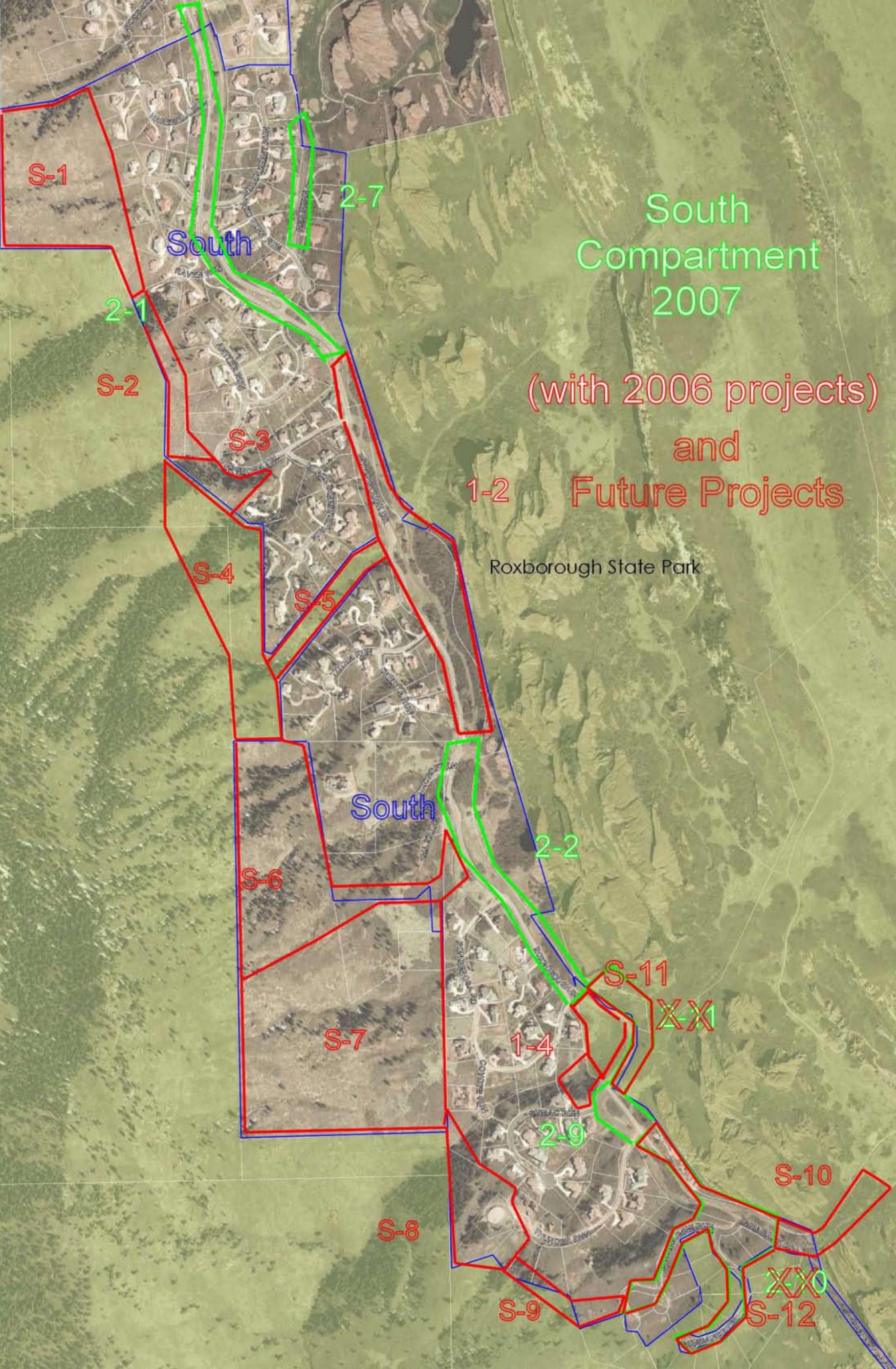
West

2-8

2-8

2-11

2-11



Roxborough Compartments

Legend
Parcels
Pike National Forest
Roxborough State Park



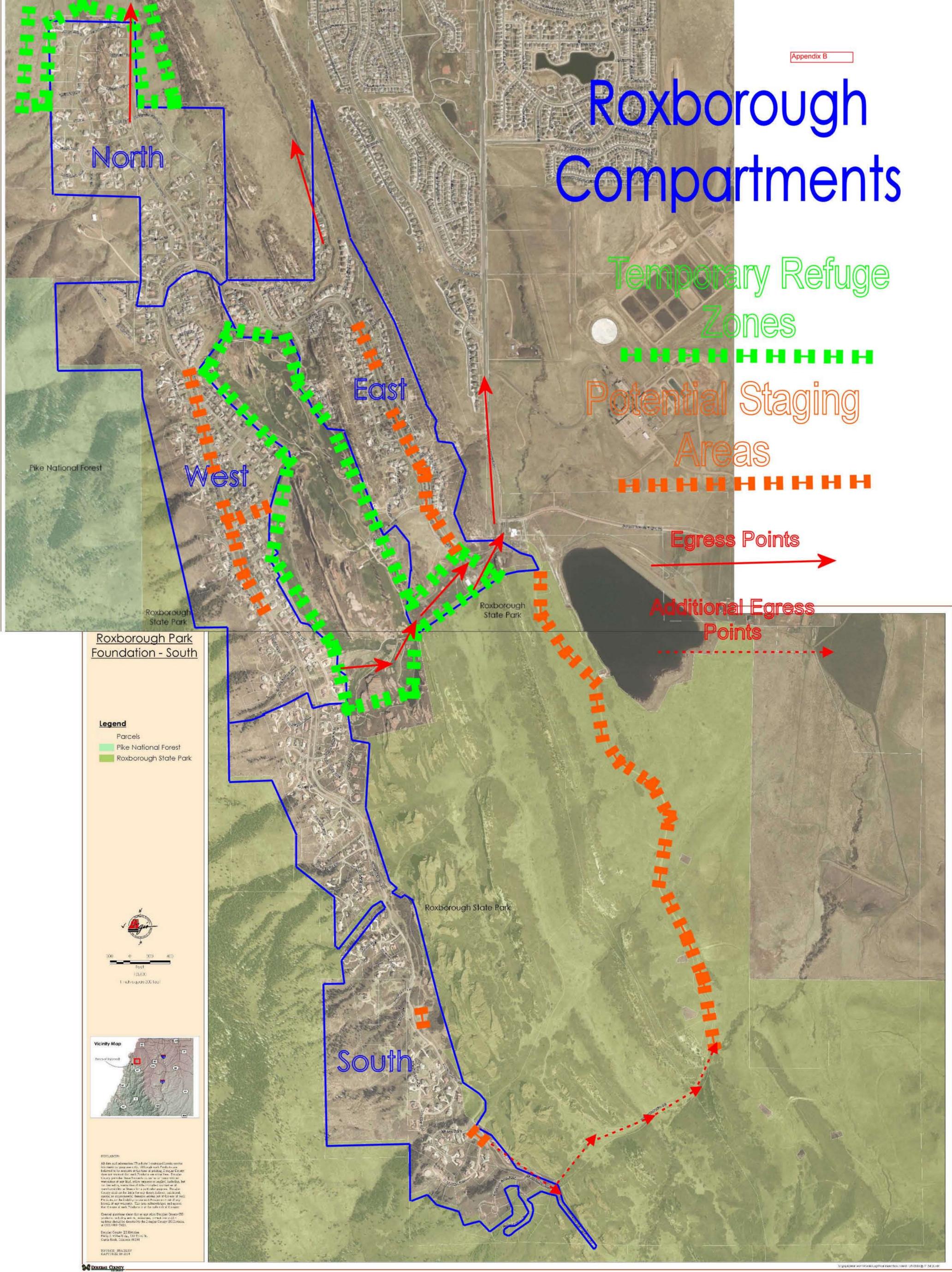
DISCLAIMER:
All data and information ("Data") contained herein are for informational purposes only. All data were provided to the County by the County and are subject to change without notice. The County is not responsible for any errors or omissions in the Data. The County is not responsible for any damages, including consequential, special, or exemplary damages, arising out of or from the use of the Data. The County is not responsible for any liability or loss of any kind, including but not limited to, the loss of any data, information, or other property, arising out of or from the use of the Data. The County is not responsible for any liability or loss of any kind, including but not limited to, the loss of any data, information, or other property, arising out of or from the use of the Data.

Roxborough Park Foundation - South

Legend
Parcels
Pike National Forest
Roxborough State Park



DISCLAIMER:
All data and information ("Data") contained herein are for informational purposes only. All data were provided to the County by the County and are subject to change without notice. The County is not responsible for any errors or omissions in the Data. The County is not responsible for any damages, including consequential, special, or exemplary damages, arising out of or from the use of the Data. The County is not responsible for any liability or loss of any kind, including but not limited to, the loss of any data, information, or other property, arising out of or from the use of the Data. The County is not responsible for any liability or loss of any kind, including but not limited to, the loss of any data, information, or other property, arising out of or from the use of the Data.



Refuge Zones and Staging Areas

Roxborough Park has only one full-time ingress/egress point for the community. Two “emergency only” egress points are currently being developed at the end of Roxborough Drive North and Fox Paw Trail. One internal egress, across the Arrowhead Golf Course, goes from Rain Dance Trail to Haney Park.

Given the lack of adequate egress for the entire community, a series of refuge zones and staging areas are recommended to allow a more orderly evacuation of the community.

Refuge Zones

These are designated locations where residents will be able to take refuge briefly until directed to leave the community. These should not be confused with “safety zones” utilized by firefighters. The term “safety zone” is not used here due to the false impression that may be given to untrained and ill-equipped civilians. The term “refuge zone” is intended to indicate areas of relatively low fire risk and resulting dangers. These are intended only as temporary until evacuation can occur.

It should be understood that in a large fire event, these areas will be potentially uncomfortable to anyone not familiar with fire behavior. The presence of heavy smoke, extreme heat and swirling firebrands will be disconcerting to most people.

The following criteria should be used as a minimum size for any refuge area:

1. Fuel type immediately adjacent to the area should be either “A” or “O”. These may include golf course irrigated areas and mown areas.
2. Diameter should be at least four times the potential maximum flame height or a minimum of 164’ in width. Maximum flame height can vary depending on fuel type, slope, wind and fuel moisture.
3. Not all refuge zones will be available during all fire events.

The two golf courses in and around Roxborough will provide good refuge zones in the event of a fast moving wildfire.

Staging Areas

The primary staging areas will be along heavily mowed roadways with divider medians. This will primarily be along Roxborough Drive. Fuel treatment projects planned along major travel ways are intended to provide for safer evacuation.

The following map shows potential Refuge and Staging areas. These should be monitored annually and maintained seasonally to keep adjacent hazards low.

Tips from FEMA (www.fema.gov/hazard/wildfire/wf_before.shtm)

What to do before a Wildfire

If you see a wildfire, call 9-1-1. Don't assume that someone else already called. Describe the location of the fire, speak slowly and clearly, and answer any questions asked by the dispatcher.

Before the Fire Approaches Your House

1. Evacuate. Evacuate your pets and all family members who are not essential to preparing the home. Anyone with medical or physical limitations and the young and the elderly should be evacuated immediately.
2. Wear Protective Clothing.
3. Remove combustibles. Clear items that will burn from around the house, including wood piles, lawn furniture, barbecue grills, tarp coverings, etc. Move them outside of your defensible space.
4. Close/Protect Openings. Close outside attic, eaves and basement vents, windows, doors, pet doors, etc. Remove flammable drapes and curtains. Close all shutters, blinds or heavy non-combustible window coverings to reduce radiant heat.
5. Close Inside Doors/Open Dampers. Close all doors inside the house to prevent draft. Open the damper on your fireplace, but close the fireplace screen.
6. Shut Off Gas. Shut off any natural gas, propane or fuel oil supplies at the source.
7. Water. Connect garden hoses. Fill any pools, hot tubs, garbage cans, tubs or other large containers with water.
8. Pumps. If you have gas-powered pumps for water, make sure they are fueled and ready.
9. Ladder. Place a ladder against the house in clear view.
10. Car. Back your car into the driveway and roll up the windows.
11. Garage doors. Disconnect any automatic garage door openers so that doors can still be opened by hand if the power goes out. Close all garage doors.
12. Valuables. Place valuable papers, mementos and anything "you can't live without" inside the car in the garage, ready for quick departure. Any pets still with you should also be put in the car.

Preparing to Leave

1. Lights. Turn on outside lights and leave a light on in every room to make the house more visible in heavy smoke.
2. Don't lock up. Leave doors and windows closed but unlocked. It may be necessary for firefighters to gain quick entry into your home to fight fire.

The entire area will be isolated and patrolled by sheriff's deputies or police.

What to do During a Wildfire

Survival in a vehicle

1. This is dangerous and should only be done in an emergency, but you can survive the firestorm if you stay in your car. It is much less dangerous than trying to run from a fire on foot.
2. Roll up windows and close air vents. Drive slowly with headlights on. Watch for other vehicles and pedestrians. Do not drive through heavy smoke.
3. If you have to stop, park away from the heaviest trees and brush. Turn headlights on and ignition off. Roll up window and close air vents.
4. Get on the floor and cover up with a blanket or coat.
5. Stay in the vehicle until the main fire passes.
6. Stay in the car. Do not run! Engine may stall and not restart. Air currents may rock the car. Some smoke and sparks may enter the vehicle. Temperature inside will increase. Metal gas tanks and containers rarely explode.

If you are trapped at Home

1. Stay calm. As the fire front approaches, go inside the house. You can survive inside. The fire will pass before your house burns down.

If Caught in the open

1. The best temporary shelter is in a sparse fuel area. On a steep mountainside, the back side is safer. Avoid canyons, natural "chimneys" and saddles.
2. If a road is nearby, lie face down along the road cut or in the ditch on the uphill side. Cover yourself with anything that will shield you from the fire's heat.
3. If hiking in the back country, seek a depression with sparse fuel. Clear fuel away from the area while the fire is approaching and then lie face down in the depression and cover yourself. Stay down until after the fire passes.

What to do After a Wildfire

1. Check the roof immediately. Put out any roof fires, sparks or embers. Check the attic for hidden burning sparks.
2. If you have a fire, get your neighbors to help fight it.
3. The water you put into our pool or hot tub and other containers will come in handy now. If the power is out, try connecting a hose to the outlet on your hot water heater.

4. For several hours after the fire, maintain a “fire watch.” Re-check for smoke and sparks throughout the house.

APPENDIX B

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 disengagement trigger points
 Map/Weather Kit/Watch/IAP

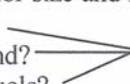
Communication(s)

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

Escape Route(s)

More than one escape route
 Avoid uphill escape routes
 Scouted: Loose soils/Rocks/Vegetation
 Timed: Slowest person/Fatigue and Temperature factors
 Marked: Flagged for day or night (NFES 0566)
 Evaluate: Escape time vs. Rate of spread
 Vehicles parked for escape

Safety Zone(s)

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

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

Source: USFS Incident Response Pocket Guide
 January 2002

Permission for Roxborough Park Foundation Property Use During a Declared Emergency

During a Douglas County emergency incident impacting Roxborough Park, use of Roxborough Park Foundation 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 Roxborough Park and requiring Foundation land use for fighting or resolving the emergency, the Roxborough Park Foundation board has pre-approved and granted property use permission to the emergency event incident commander.

The pre-approved property use permission document, signed by the Roxborough Park Foundation board members is included in this Community Wildfire Protection Plan as Appendix N. The pre-approval/property emergency-use authorization will be updated annually at the time of the annual Community Wildfire Protection Plan review and update. The aforementioned, signed emergency property-use authorization document will be provided for filing with the Douglas County Emergency Services Director, Colorado State Forest Service, and the West Metro Fire Protection District Chief.

**DECLARED-EMERGENCY USAGE PERMISSION
For
ROXBOROUGH PARK FOUNDATION PROPERTY**

This document authorizes emergency resolution use of Roxborough Park Foundation property in the event of a Douglas County emergency event impacting the community of Roxborough Park. This authorization is granted to the incident commander of the emergency for usage by professional emergency agencies and their personnel.

Roxborough Park Foundation Property Description or Designation Usage Authorized:

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

Approved Emergency Usage Activities Authorized:

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

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

Signed this ____ day of _____, _____ by Roxborough Park Foundation Board of Directors:
(number) (month) (year)

President

Vice President

Secretary

Treasurer

Assistant Secretary

Appendix D
Evaluation and Monitoring
Sample Form

Roxborough Park Foundation 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:

To: Roxborough Wildfire Mitigation Committee
Fm: Lieutenant Kevin P. Centola West Metro Fire
Re: response procedures for wildland fires

To the committee,
Attached are West Metro Fire Response procedures. On page 4 of the document specifically identifies the response procedures for wildland fires.
In short this is how it would look:

On a small grass fire the units responding would be:

Engine 15
Brush 15

On a large grass fire the response would be

Engine 15
Brush 15
An additional engine. Could be South Metro 40, or a West Metro engine

On a red flag day

Engine 15
Brush 15
Additional Engine
District Chief

On an additional alarm

1 Engine
1 Brush
1 Medic

If structures are threatened

2 Engines
1 Medic
District Chief
1 Tower
1 Rescue
1 RIC (rapid intervention crew)
Safety Officer
Investigator

I have also attached West Metro Fire Operating Procedures for wildland fires. This document is a guide for officers of West Metro. This procedure gives all officers information on sizing up a fire, strategies to attack fire, safety considerations, and Resources available for firefighting crews.

The final document is designed for West Metro Dispatchers on proper procedures for requesting aircraft.

Thanks.
Kevin

Water

1. Number of Tanks – currently one 1.0 mgal tank
(There are 2 additional tanks proposed – a .75 mgal tank in zone 3 and a 0.9 mgal tank in zone 2. We hope to have the tanks on line in the summer of 2007)
2. Tank Location – the 1.0 mgal tank is located in zone 4 (10188 Thunder Run)
3. Zone 4 Tank Capacity – one million gallons – 86' x 24'
4. Zone 4 Tank Service Area – serves all of Roxborough Park and the West Metro Fire Station
5. Normal Load During Fire Season – we try to maintain 13' minimum at all times
6. Average Re-Charge Time – 1 foot per hour, however, this varies with system demands
7. Number of Hydrants in Roxborough Park – 132
8. Distance Between Hydrants – varies
9. Water Pressure by Area (Avg.)

South	88	PSI
West	86	PSI
North	98	PSI
East	101	PSI
10. Is Every Area in Roxborough Park on a Loop? No- see attached list
11. What Happens if There is a Major Power Outage? – The District has currently in place back-up generators at both treatment plants. The District has a capital improvement project to install pump station back-up generators in 2008.

~~35 to 40 thousand per min~~

35 to 40 thousand hr

800
10
40,000

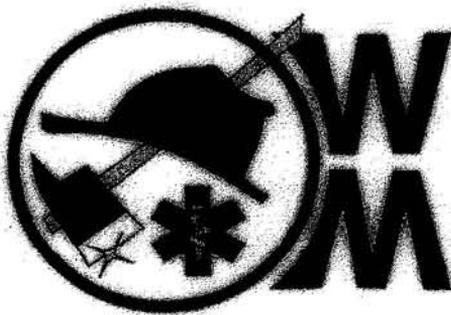
500 ft Avg. Between

ISO CLASS 6 RPUFD

3 metro including Rox

West Metro Fire Protection District Standard Operating Procedures

2006



**WEST METRO
FIRE PROTECTION DISTRICT**

**Dedicated to the Firefighters of West Metro Fire Rescue
And the Community they serve**

2006

STANDARD OPERATING PROCEDURE

OPERATIONS

S.O.P. #: 106

DATE: January 1, 2006

CATEGORY: Response

PAGES: 5

I. Purpose:

To specify units responding based on the type of call and to establish response time benchmarks.

II. Procedure:**A. Response Time Standards**

According to NFPA 1710 and Departmental Standards, the following time frames are established as benchmarks for response to 90% of WMFR incidents.

- | | | |
|-------------------|---|------------------|
| 1. Out of Station | - | 1 minute |
| 2. On-Scene | - | Within 4 minutes |

B. SINGLE UNIT RESPONSE:

1. 1 Medic Unit – CODE

- a) Medical Mutual Aid: Request for Medic Unit only by cooperating agency – at discretion of District Chief.

2. 1 Engine – CODE

- a) Auto Aid: Automatic response with South Metro, Littleton, Lockheed Martin and with established Auto-Aid Agreement agencies
- b) Mutual Aid Requests: At the discretion of the District Chief.
- c) Fire-Non-Structural: Small grass fires, dumpsters, etc.
- d) Vehicle Fire: Not in or near a structure
- e) Residential Fire Alarm:

3. 1 Engine –NON-CODE

- a) Carbon Monoxide Detector: Report of activated CO detector, no medical reported. (Other Units may be substituted for that Company's Engine if Engine is out of service or unavailable).
- b) Confirmed False Alarm: R/P or monitoring company states false alarm and unit needs to respond to reset alarm only.

4. Officer's Discretion (response based upon urgency of call):

- a) Assistance Requests: Lockouts with pet involvement or urgently needed medication involved, flooded structures, Knox Boy key placement, chopper landing, lift assist, assist police agencies, etc.
- b) Public Hazards: Downed power lines, tree limbs, etc.
- c) Spills: Minor gasoline spills (10 gal. or less).

NOTE: Tower 3 may be substituted if Engine 3 is unavailable and Tower 12 if Sqrt 12 is out of service or unavailable.
 Rescue 10 may be substituted (non-fire calls only) if Engine 10 is out of service or unavailable.

C. TWO UNIT RESPONSES: (Second Engine NON-CODE)

1. 2 Engines
 - a) Fire alarms: Monitored/Audible Fire Alarms
 - b) Gas Leaks and Odor Investigations (Residential): Unknown odor or smell of gas inside or outside of a structure.
 - c) Sparking Outlets/Switches, Smoking Ceiling Fans/Ballast: R/P reports appliances no longer smoking and no flames are present.
 - d) Oven/Dryer Fires: R/P reports fire contained to appliance.
 - e) Smoke Investigations: Inside or outside.
2. 1 Engine
 1 Medic Unit
 - a) Medic Calls: All medical calls. Responses with a private ambulance – SOP #604

NOTE: Tower 3 may be substituted if Engine 3 is unavailable and Tower 12 if Sqrt 12 is out of service or unavailable.
 Rescue 10 may be substituted (non-fire calls only) if Engine 10 is out of service or unavailable.

D. THREE UNIT RESPONSES: (Second Engine and Tower/Rescue NON-CODE)

1. Gas Leaks and Odor investigations (Commercial): Unknown odor or smell of gas inside or outside of a structure.

E. FULL RESPONSE:

1. Confirmed Structure Fire: (All Units Respond CODE.)

2 Engines	R/P or on scene personnel confirms fire or any
1 Medic Unit	report of an explosion
1 District Chief	
1 Tower	
Rescue 10	
RIC Sqrt	
SaM-1	
Bureau 9	
2. Reported Structure Fire: (First Due Company responds CODE, all remaining Units NON-CODE until advised otherwise by Command)

2 Engines	R/P reports a small fire (mattress, trash can)
1 Medic Unit	that has the potential to spread/expand. Also, can

- 1 District Chief
- 1 Tower
- Rescue 10
- RIC Squirt
- Sam-1
- Bureau 9

be used by Dispatch if incident is not confirmed but unsure of complexity.)

F. SECOND ALARM:

- 1. 2 Engines
- 1 Medic Unit
- 1 District Chief
- 2nd Tower
- Air-3
- Notification of Chiefs: 1 through 7

Notifications are automatically made by Dispatch and Division responsibilities are performed upon activation or when the call appears that it will be lasting more than one (1) hour.

G. THIRD ALARM AND SUBSEQUENT ALARMS:

- 1. 3 Engines
- 1 Aerial
- 1 Medic Unit

Response will be a TASK FORCE consisting of units listed. May be obtained from WMF/R, Denver and South Metro departments or others. Notifications made under 2nd Alarm responses.

H. SPECIAL ALARMS:

- 1. 1 Engine
- 1 Medic Unit
- 1 District Chief
- Dive 2
- Tower or Rescue 10
- Sam-1
- WFD Dive-1
- SMFR Dive-3

- 2. 1 Engine
- 1 Medic Unit
- Dive-2

- 3. Dive-2

- 4. 1 Engine
- 1 Medic Unit
- 1 District Chief
- HazMat 5
- Tower or Rescue 10
- Sam-1

Water or Swift Water
 The Metro Dive Team will be activated automatically if the call is received as a known dive incident or at the request of the District Chief or Incident Commander, by pager, per Dispatch Procedures. Westminster Fire (Dive-1) and South Metro Fire (Dive-3) automatically dispatched for rescue.

Ice Rescue involving animals or people: R/P reporting animal and/or person(s) still on the surface.

Recovery Only (NON-CODE)

Hazardous Materials – Notifications made to the Adams Jeffco Team per WMF/R SOP's. An additional Engine will be dispatched if the call is in Station 5's first in response area.

- 5. 1 Engine
1 Medic Unit
1 District Chief
Company 10
Tower
SaM-1
Air-3
Technical Rescue – High angle, low angle, confined space, trench rescue, collapse, etc.
- 6. 1 Engine
1 Brush Company
1 District Chief
Large Grass Fire or any reported brush fire on a "Red Flag Day"

- I. ADDITIONAL ALARMS: Each additional alarm request will add the following resources to the incident.
- 1 Engine
 - 1 Brush Company
 - 1 Medic

NOTE: If structures are involved a "FULL RESPONSE" should be requested. The IC is then responsible for notifying incoming units if they will be performing interior or exterior operations to allow crews to don the appropriate PPE.

J. AUTO ACCIDENTS:

- 1. 1 Engine
1 Medic Unit
Any MVA that is reported and not located on one of the four highways covered in Administrative Procedure #2310-Highway Incident Scene Protection.
- 2. 2 Engines
1 Medic Unit
Any MVA that is reported on one of the four highways covered in Administrative Procedure #2310-Highway Incident Scene Protection.
- 3. 1 Engine
1 Medic Unit
Tower or Rescue
1 District Chief
SaM-1
Any MVA where an R/P or on scene resource is reporting parties trapped.
- 4. 2 Engines
1 Medic Unit
Tower or Rescue
1 District Chief
SaM-1
Any MVA on one of the four highways covered in Administrative Procedure #2310-Highway Incident Scene Protection where an R/P or on scene resource is reporting parties trapped.

Incident Command is responsible for ordering appropriate resources and may modify these assignments as required or necessary. IC also has the responsibility to order and release units as the incident requires and is expected to modify response based upon conditions.

K. TEMS RESPONSE:

Engine 7
 Medic 7
 District Chief
 (notification only)

At the request of LPD (units will be notified by pager only). If any unit from CO-7 is unavailable the closest unit (either Engine or Medic) will be dispatched until they can be relieved by the appropriate CO-7 unit.

L. MCI PROCEDURE:

1 Engine
 3 Medics
 District Chief
 SaM-1

The trigger point for the declaration of an MCI is the request for a third medic unit. It is at this time that the IC must declare whether or not the incident is an MCI. If the IC fails to do so Dispatch will inquire, as a reminder, if the IC wishes to declare it as such. Coincides the response of additional resources for support of Operations, such as Medic Unit drivers.

III. Reference:

Department Policy

Approved:
 Deputy Chief of Operations

Dated: 1/1/06

Approved:
 Fire Chief

Dated: 1/1/06

STANDARD OPERATING PROCEDURE**SPECIAL OPERATIONS****S.O.P. #: 500****CATEGORY:** Wildland Fires**DATE:** January 1, 2006**PAGES:** 2**I. Purpose:**

To provide a guideline for initial operations at a fire in Wildland or Urban Interface.

II. Procedure:

The following is a guideline for operations at Wildland fires. While Operational Principles (SOP #102) and Incident Command (SOP #201) remain the same, strategies, tactics as well as safety considerations on these incidents differ from structural fires.

A. Operations:

1. Size-Up Considerations:

- a) Immediately threatened life or property
- b) Fuel type
- c) Rate of spread
- d) Topography
- e) Weather (wind, temperature, relative humidity, thunderstorms)
- f) Access
- g) Water supply

2. Strategies:

a) Offensive:

- 1) Start with an anchor point, preferably the heel of the fire
- 2) Hose line or progressive hose lay
- 3) Mobile attack along the flanks

b) Defensive:

- 1) Fire line construction or fire break utilization
- 2) Backfiring (only by personnel trained and USFS certified)
- 3) Structure protection:
 - Back in apparatus
 - Limited commitment of equipment
 - Continuous size-up and risk benefit assessment
 - Structural preparation (close windows, remove drapes, exterior fuel reduction)

B. Additional Tools/Resources:

1. Class A Foam
2. CAFS Engine 9
3. Water Tenders (request through Dispatch)
4. Hand Crews (request through Dispatch)
5. Helicopters, Single Engine Air Tankers (SEAT), Air Tankers (request through Dispatch)

6. Sheriff's Office or PD for evacuations (request through Dispatch)

C. Safety Considerations:

1. Wear proper PPE and fire shelters.
2. Be careful working in terrain not seen in daylight.
3. Be careful driving apparatus and working in smoke.
4. Beware when working with fire below your position.
5. Beware of snags and rolling or falling debris.
6. Rehabilitation and relief for fatigued crews.

D. Standard Firefighting Orders:

1. Keep informed on fire weather conditions and forecasts
2. Know what your fire is doing at all times
3. Base all action on current and expected fire behavior
4. Have escape routes for everyone and ensure they are communicated
5. Post a look out
6. Be alert, keep calm, think clearly, act decisively
7. Maintain communications with your Firefighters, your Supervisor and adjoining crews.
8. Give clear instructions and be sure they are understood.
9. Maintain control of crews at all times.
10. Fight fire aggressively but provide for safety first.

III. Reference:

Fireline Handbook

Approved:
Deputy Chief of Operations

Dated: 1/1/06

Approved:
Fire Chief

Dated: 1/1/06

Wildland Fire Notification / Aircraft Requests

- IC must be on scene and have performed a size up.
- Must have the capability of communicating with the aircraft on USFS Air/Ground frequency. (172.475)
- Should be able to provide a location, either in terms of Township/Range/Section or GPS coordinates. GPS coordinates must be in degrees/minutes/seconds format.
- Contact Pueblo Dispatch to advise them that we have a fire, and provide the location to prevent duplicate reports and responses.
- Do not order the SEAT directly from Pueblo, but you may advise them that a request may be coming through Jeffco/Dougco or CSFS and ascertain availability.
- Jeffco/Dougco will forward the SEAT request to Pueblo on approval of the Sheriff's Office.
- CSFS FDO must be notified on any fire involving state lands, Denver Water, Denver Mountain Parks, and Jefferson Country Open Space properties. Notification of other wildland fires is desirable.

