Warning and Disclaimer: The degree of protection from wildfire hazards intended to be provided by this plan is considered reasonable for planning purposes and 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 protection devices, and ignition sources may contribute to future damages to structures and land uses even though properly permitted within designated wildfire hazard areas.

ACCEPTANCE

The Monument Fire District (MFD) Community Wildfire Protection Plan (CWPP) was developed in accordance with the guidelines set forth by the Healthy Forests Restoration Act of 2003 and the Colorado State Forest Services' Minimum Standards for CWPP's.

This CWPP is a collaborative effort to guide the MFD (District) and its stewardship management activities, including wildfire protection. The activities recommended in this plan are appropriate to meet District objectives and will benefit the natural resources and reduce the risk from wildland fire. This plan is voluntary, and where possible, the District intends to apply the recommended practices, thus improving community preparedness, and increasing public safety.

The CWPP has been reviewed and approved by the MFD CWPP Core Team.

President or Fire Chief
Monument Fire District

6/30/25
Date

Deputy Fire Warden - Elizabeth Ross

El Paso County

7/8/25
Date

Michael Till Digitally signed by Michael Till Date: 2025.07.02 10:47:10 -06'00'

Supervisory Forester
Colorado State Forest Service

Date

Table of Contents

INTRODUCTION AND ACKNOWLEDGEMENTS

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

ACKNOWLEDGEMENTS

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

- Monument FD Firefighters
- Town of Monument Council
- Colorado State Forest Service
- The Nature Conservancy
- USDA Forest Service
- USDI Bureau of Land Management
- United States Air Force Academy
- El Paso County Sheriff's Office, Wildland Fire Unit
- Pikes Peak Regional Council of Governments

Appreciation is also extended for information and support material to:

- Pikes Peak Regional Office of Emergency Management
- The many residents of the Fire Protection District who took time from their busy schedules to guide this document to its completion

I. EXECUTIVE SUMMARY

The Monument Fire District (Monument or the District) Community Wildfire Protection Plan (CWPP) is sponsored by the Pikes Peak Regional Council of Governments ("PPACG") and Monument Fire District (MFD) for the safety of life and protection of property in communities and neighborhoods throughout the District and their immediate vicinity. Participating in the establishment of this CWPP was a broad stakeholder group including MFD,Colorado State Forest Service (CSFS),), Bureau of Land Management (BLM, US Dept. of Interior), USDA Forest Service (USFS), U.S. Air Force Academy Natural Resources Department (AFA-NR), El Paso County Department of Environmental Services (EPCO), and residents of the District. 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 to upholding ecological values. Wherever possible, other values such as wildlife habitat enhancement, forest health restoration, improved aesthetics and increased property values will be factored in.

The Monument area includes a number of significant areas outside of their boundaries that pose a potential wildfire threat to the communities. These areas known collectively as the Wildland Urban Interface (WUI) area consist of Pike National Forest to the west, the Air Force Academy to the south, and park and open space lands managed by local, county and NGO's. With this CWPP, care was taken to propose and provide mitigation within the District 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. Seven areas with varying degrees of mitigation needs were identified within the neighborhoods. Mitigation for these areas will be reviewed annually for scheduling with full completion to take from twelve to twenty years, depending on availability of funds from multiple sources.

Four primary strategies are employed to achieve mitigation: 1) Each neighborhood or community providing fuel mitigation treatment to HOA owned land and critical private parcels; 2) Encouragement and support of private landowners doing their own wildfire fuel mitigation and Firewise home safety practices; 3) Working with Monument and other stakeholder agencies to require developers of stand-alone, undeveloped areas within zones surrounding the communities to mitigate land developments before building occurs, and to establish ongoing mitigation treatments for the future; and 4) support of on-going and future fuel treatment projects on federal, State and NGO properties.

This CWPP identifies the response, both from professional agencies and volunteer groups, that may be employed for wildfire protection or suppression when wildfires threaten areas within or outside the District. The El Paso County Sheriff's Office, in conjunction with the District, has the primary responsibility for protecting life and property in the District in the event of a wildfire incident. If a wildfire event is beyond their resource capability, the District is party to a mutual aid agreement for support from other El Paso County Fire Districts, City of Colorado Springs and U.S. Air Force Academy fire departments.

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

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

This CWPP is a "*living*" document that will be evaluated and maintained annually by the Fire Chief and District staff at the direction of the Monument Fire District Board of Directors. 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 remains viable and

achieves its original intent. Annual meetings should be held with stakeholder agencies to review the progress and effectiveness of this CWPP. A general public meeting should also be conducted annually to review the progress of the CWPP and receive public input.

The Fire District includes many communities with CWPPs of their own and Firewise USA Sites that have Community Assessments and Action Plans specific to the community. These documents reflect the communities specific plans and objectives better than this large scale CWPP can. The CWPPs and Firewise documents are incorporated into this CWPP. All communities in the District are encouraged to evaluate the hazards specific to their community and develop specific action plans to restore Fire Adapted forests.

Figure 1. Thinning and oak brush mastication created a fire adapted forest on the Monument Fire Center. In spring **2024, a controlled burn maintained the forest adjacent to Shiolo Pines. As shown in the left photo, the fire burned along the ground removing oak sprouts and accumulated fuel. By the spring of 2025, abundant grass provides good forage for wildlife.**

II. GOALS, PLAN COMPONENTS & ON-GOING MAINTENANCE OF PLAN

Primary Purpose

The Monument CWPP was developed for the safety of life and protection of property from wildfire emergencies within the boundaries of the District and the adjacent surrounding areas while upholding the ecological values of the community.

The plan was developed by a broad stakeholder group identified in the *Executive Summary of* this document. The Monument Wildfire Protection Plan addresses the areas of wildfire hazard mitigation and emergency response to the impact of widespread wildfires. The plan has three major focus areas: fuel mitigation, emergency response and the influencing and obtaining of private, state or federal grants to assist in carrying out prevention and fuel mitigation projects. In addition, the plan contains administrative details 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.

Figure 2. Fuel mitigation, properly done, is not a clearcut nor does it harm the forest. Fuel mitigation restores healthy forests to their natural fire adapted condition.

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 altered wildlife habitat.
- To protect critical infrastructure and municipal and Special District water resources flowing into, through and out of the fire district.

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.

Private, State and Federal Grants:

- To influence where and how private, NGO, county, state and federal agencies implement fuel reduction by proposing alternative locations and methods for treatment on lands in the CWPP zones.
- To assist in the acquisition of private, local, state and federal funds for all land ownerships in the District 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 Monument CWPP provides four primary sections plus reference information. Geographical and ecological background along with forest management and wildfire history is detailed in Chapter 3. Chapters 4 and 5 cover, respectively, hazards assessment and the resources for addressing wildfires. Chapter 6 identifies communication and information support for the residents in and around the District in the event of a wildfire emergency. Finally, Chapter 7 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 Monument CWPP is accomplished through annually monitoring plan accomplishments and effectiveness, and goal setting for the coming year. By adjusting the plan to account for current changes in wildfire hazard conditions, response capabilities, technologies and ancillary circumstances, the Monument CWPP is meant to be a "*living document*" which is updated annually to assure currency in both wildfire prevention and planned response to wildfire situations both in District's wildland/urban interface areas and outside the neighborhoods.

Each year, it is recommended that District staff conduct a CWPP performance review to include both an overall plan evaluation of the CWPP for the past wildfire season as well as any proposed changes to the CWPP, and mitigation goals for the following year. This schedule may be adjusted to allow conformance with the District's budget cycle. The overall evaluation and recommended changes to the CWPP should be presented to the Fire Chief during the annual program evaluation and review process. Changes should be formally incorporated into the CWPP and furnished to all stakeholders by January of the following year. These changes should also be reflected in the District budgets and applicable grant requests for the following year.

Between the aforementioned Fire District annual program evaluation process and the formal updating of the CWPP each year, the Fire Chief or designee(s) should meet with key stakeholders representing primary professional forest management, fire prevention and emergency services management to review proposed CWPP changes and updates. Once the Fire Chief and the key stakeholders are in agreement to the proposed changes and updates to the Monument CWPP, those changes and updates will be available for public perusal and comment; either at a pre-announced public meeting or through the District website.

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

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

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

III. BACKGROUND AND HISTORY

Geographic and Ecological Location

The Monument Fire District is located in northern El Paso County, it serves 43,000 residents and encompasses 62 square miles along the summit of the Palmer Divide (Monument Hill) north of Colorado Springs. The District borders Douglas County on the north, the Pike National Forest on the West. The City of Colorado Springs and the Air Force Academy on the South form the southern boundary And the eastern boundary adjoins other fire protection districts. It includes the Town of Monument, population 12,088, and many unincorporated neighborhoods along the forested south slope of the Palmer Divide.

The summit of the Palmer Divide separates the watersheds of the Arkansas and South Platte Rivers. As travelers of Interstate 25 know, storms hang up on the hill dumping more moisture there than in the lower elevations. The extra moisture that creates havoc for winter travel also gives the area its ecological character. Because of the greater moisture, extensive forests of ponderosa pine, Gambel oak, and tall grass grow on the Divide, creating a significant wildfire hazard for those who live in the area.

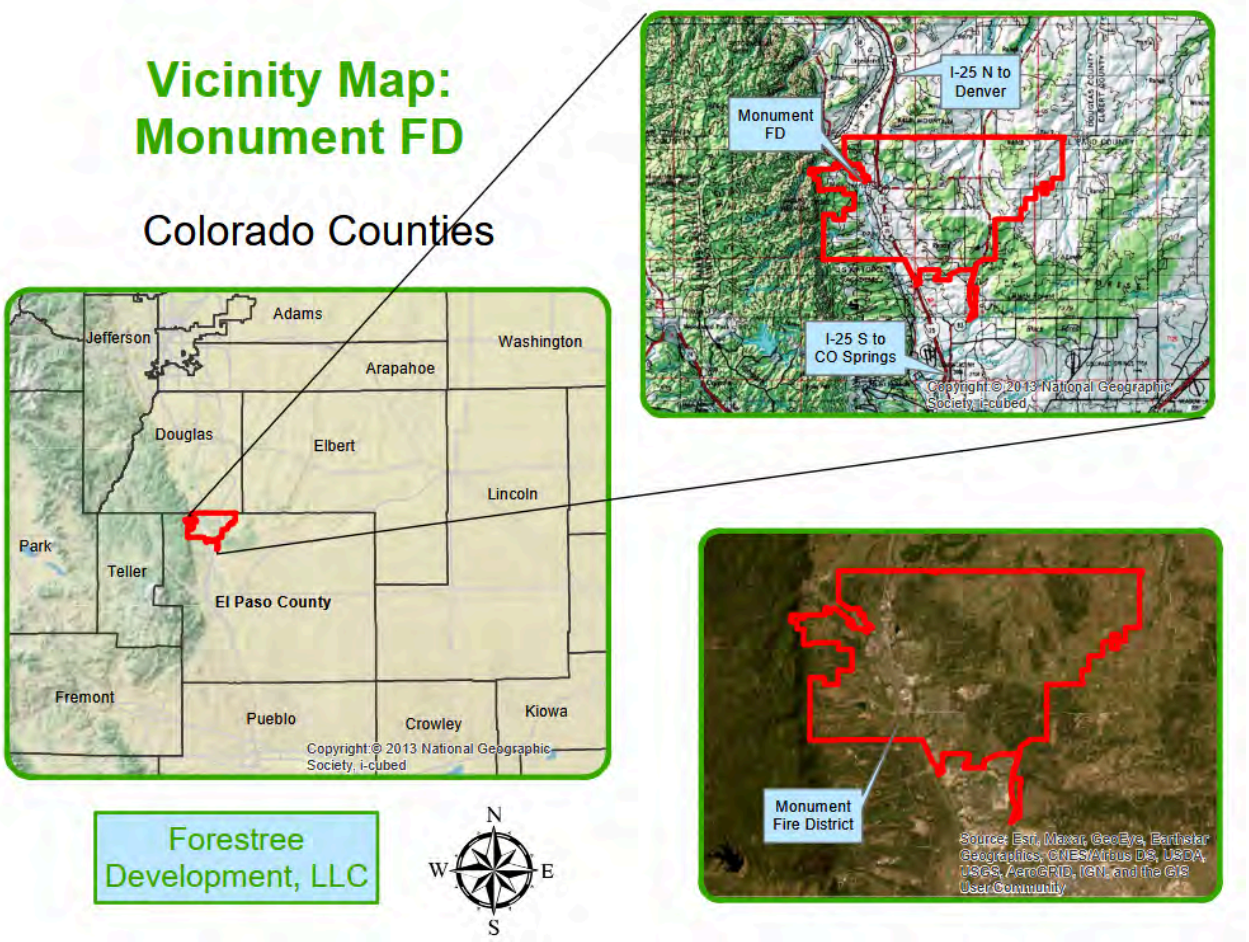


Figure 3. Vicinity Map

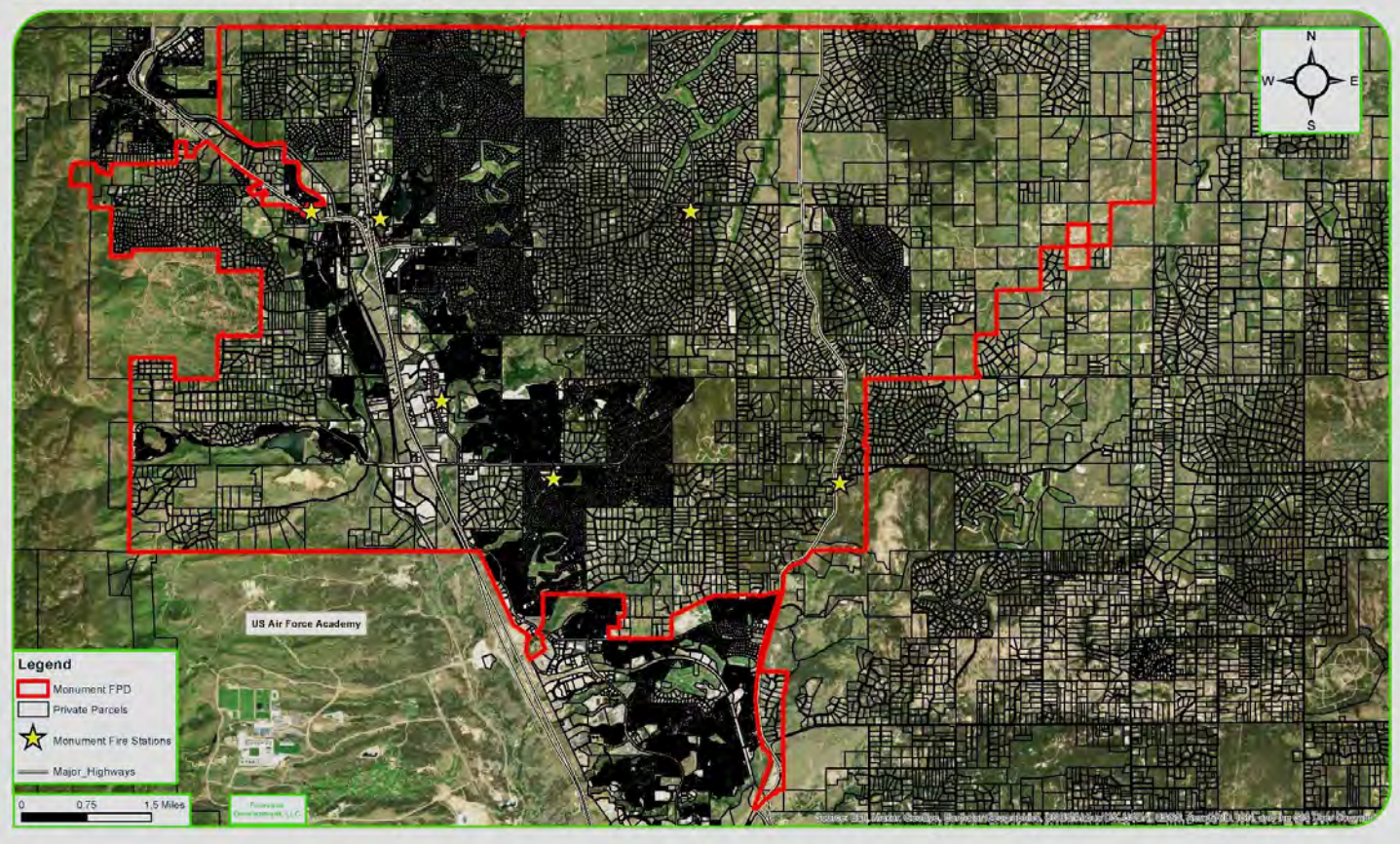


Figure. 4 Monument Fire District Property

The Fire District has rich ecological diversity and geology. Ecosystems vary from open rangelands in the low areas, transitioning through Gambel oak to ponderosa pine forests on its upper slopes. Gamble oak is the predominant shrub species found interspersed in all areas. This diversity also contributes to significant wildfire threat (see Figure 5, Ecological Values).

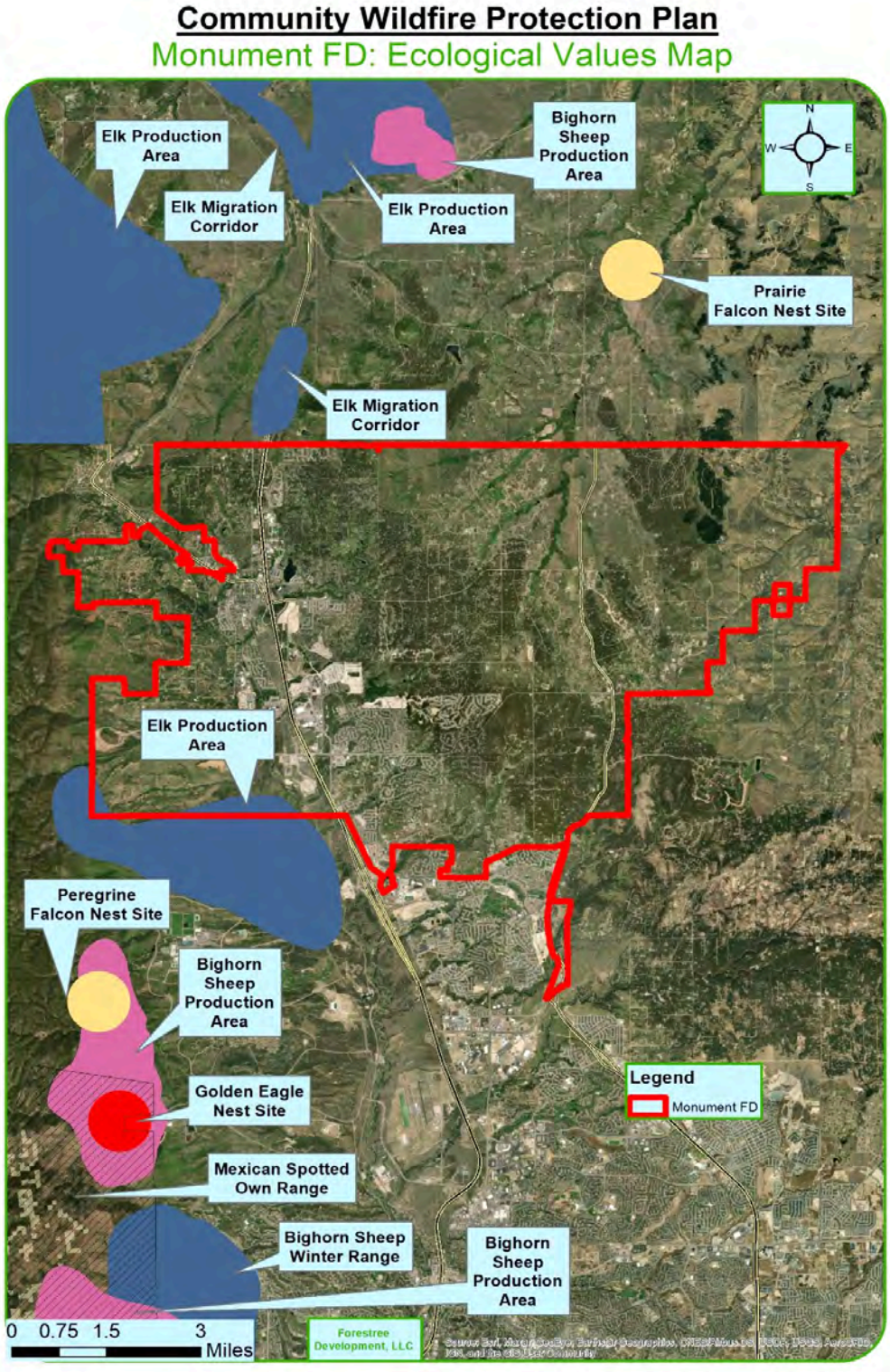


Figure 5. Ecological Values

Land ownership varies across the MFD. Federal lands predominate along the District's western boundary and are managed by the USDA Forest Service (USFS). The eastern boundary abuts other Fire Protection Districts in the Black Forest area. On the south is The U.S Air Force Academy, a US military installation controlled by the Department of Defense. East of the Academy the City of Colorado Springs borders the FPD. Land ownerships are shown in Figure 6, Land Ownership.

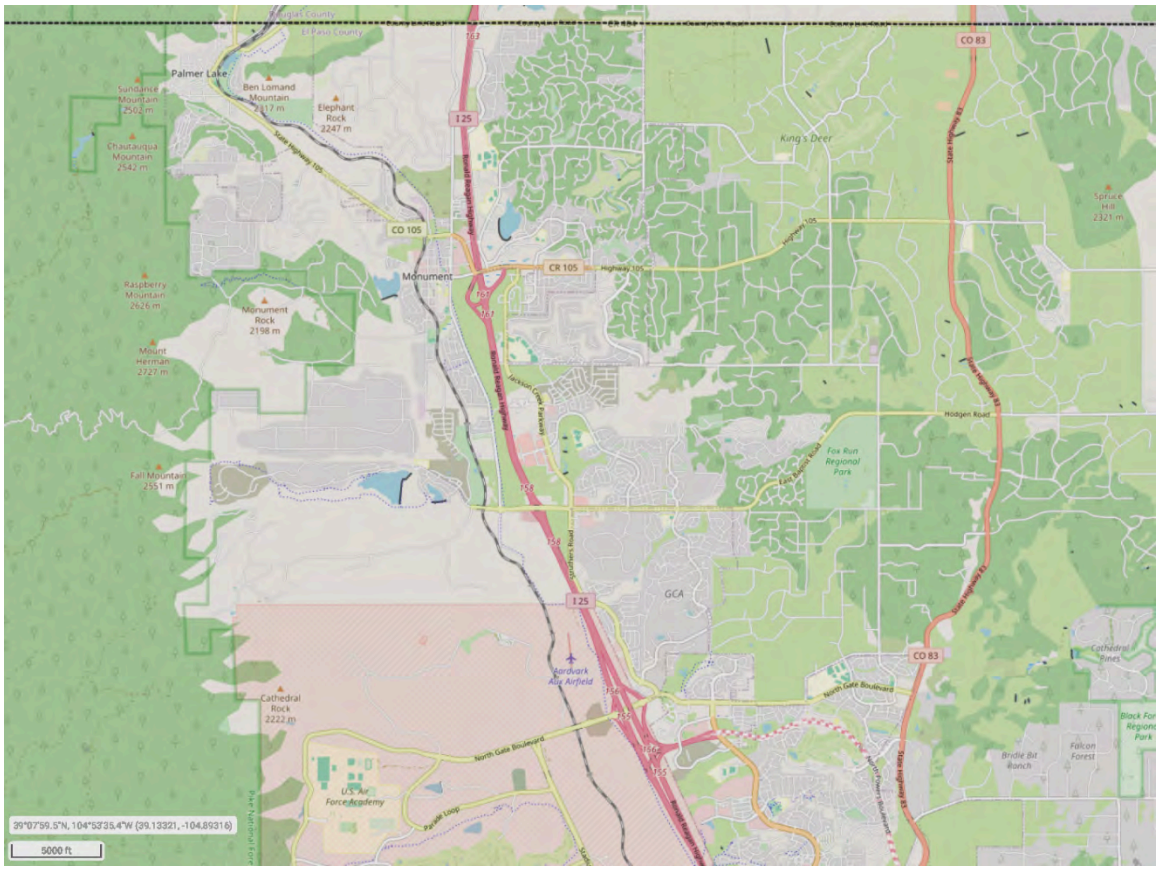


Figure 6. Land Ownership

History of the Fire Protection District

The District has a rich history. The area was used heavily for mining, timber harvesting and ranching.

The Monument Volunteer Fire Department was created in the late 1930's. Around 1975, the development of Woodmoor across I25 from the town led to the creation of the Woodmoor-Monument Fire Protection District, a full time paid department. The Woodmoor Monument District was renamed the Tri-Lakes FPD, In 2008 the Woodmoor-Monument and Tri-Lakes FPD's agreed to a full merger establishing the Tri-Lakes Monument Fire Protection District with all paid career Fire District. Continued growth in the region led to the 2002 merger between Tri-Lakes Monument and the Donald Wescott Fire Districts. The combined entity is now known as the Monument Fire District.,

Wildfire History

The Monument area is no stranger to wildfires and the need for wildfire prevention and protection. In 1880, the *Colorado Springs Weekly Gazette* noted:

> "MONUMENT, June 17th. Just now the leading subject of conversation here is the terrible drouth that has prevailed so long. . . For several weeks past the mountains west of town have been devastated by fires in the forests inflicting untold damage to the timber resources of the country. Scarcely any punishment would be too severe for those careless freighters and hunters who have been the means of such a whole- sale destruction of timber."

Small fires and lightning strikes have surely been common through the years. These were extinguished, or burned themselves out with no notice and have never been recorded. Only large fires were of sufficient interest to be recorded in the press.

In 1925, the Gazette Telegraph described a large fire northeast of Pring (a railroad water stop at the present site of Interstate 25 and Northgate Road) along the "Cherry Creek Road" firefighters recruited by the sheriff thought the fire was under control, but high winds the next day pushed it beyond control lines. The fire was finally brought under control a day later. If the "Cherry Creek Road" is present day Highway 83, the fire would have been near the site of the present MFD Station 5 (Shamrock Ranch). Numerous fire scarred trees and old burned stumps in Pleasant View, and northern Shamrock Ranch indicate a past fire in this area.

No fires were recorded until a 40 acre fire on the Baptist Camp, now Sanctuary Pointe, in April, 1965. A camper dumped hot ashes in the dump and high winds fanned the flames threatening to spread the fire to the treetops. The combination of human error, dry fuel and high winds has been around for a long time.

The first recorded fire in the modern era was the April 1989 Berry Fire south west of Monument. The fire started in Gambel Oak south of the Monument Fire Center and burned rapidly to the top of the Rampart Range. The fire scar is still visible.

On April 28, 2002, a resident of Pine Glen was mowing his field when dry grass was ignited by the muffler of the mower. Fortunately westerly winds blew the Pine Glen Fire onto the Pineries Ranch (now the El Paso County Pineries Open Space) and away from any homes. The fire burned 64 acres before it was controlled.

Two days later another fire broke out in the Glen area of Palmer Lake. It was quickly controlled, but could have been a tragic fire in a neighborhood that was choked with Gambel oak and homes built in the early years of the twentieth century. Several days later, juveniles playing with matches, ignited another fire in Gambel oak near houses at the west end of Baptist Road. Quick response and air support again prevented a tragedy. These fires were only a prelude to the June 2002 Hayman Fire.

A common thread that might go unnoticed in the fire history is that most of these large fires started in April, a time of year not commonly thought of as "fire season". There is no "fire season" along the Palmer Divide. Whenever the weather is dry or winds are strong, fire will burn.

The Hayman Fire of 2002 ignited near Lake George, but became so large that several neighborhoods and the town of Palmer Lake were placed on standby evacuation.

Two years of severe drought preceded the tragedy of the Waldo Cañon Fire, and the fire ignited on a hot, dry day with strong winds. The Cedar Heights neighborhood above Garden of the Gods was first threatened, but a combination of fuel breaks and defensible spaces completed by residents in previous years allowed firefighters to keep the fire out of that community.

On June 26th, 2012, strong downslope winds pushed the fire into the Mountain Shadows area. In a few short hours, two lives were lost, and 392 homes destroyed. The value of property lost is currently estimated as 350 million dollars, and the cost of suppression was $20 million. An additional $5 to 9 million will spent in on rehabilitation in the next few months but the true cost of the flooding will take years to determine[1]. Even after the flames are extinguished, the costs of restoration, flooding and environmental damage continue to mount.

The 2013 Black Forest Fire burned portions of the current Monument Fire District, including Shamrock Ranch, and High Forest Ranch. Proactive forest management on Shamrock Ranch and in High Forest ranch limited the damage in that community to a few, quickly extinguished, spot fires. No homes were lost, and damage was minimal.

Wildland Urban Interface (WUI) Impact Areas

With the high potential of ground lightning ignition, the Pike National Forest, abutting or within Monument District presents the greatest catastrophic wildfire threat to the District's residential areas. Much of the topography in the District consists of very steep terrain that may significantly affect mitigation and suppression efforts in terms of cost and feasibility.

It should be remembered that wildfires can also spread from private property into the surrounding areas. Human caused ignitions have the potential to burn into the State, Federal and NGO lands. The map below shows the WUI risks for the fire district.

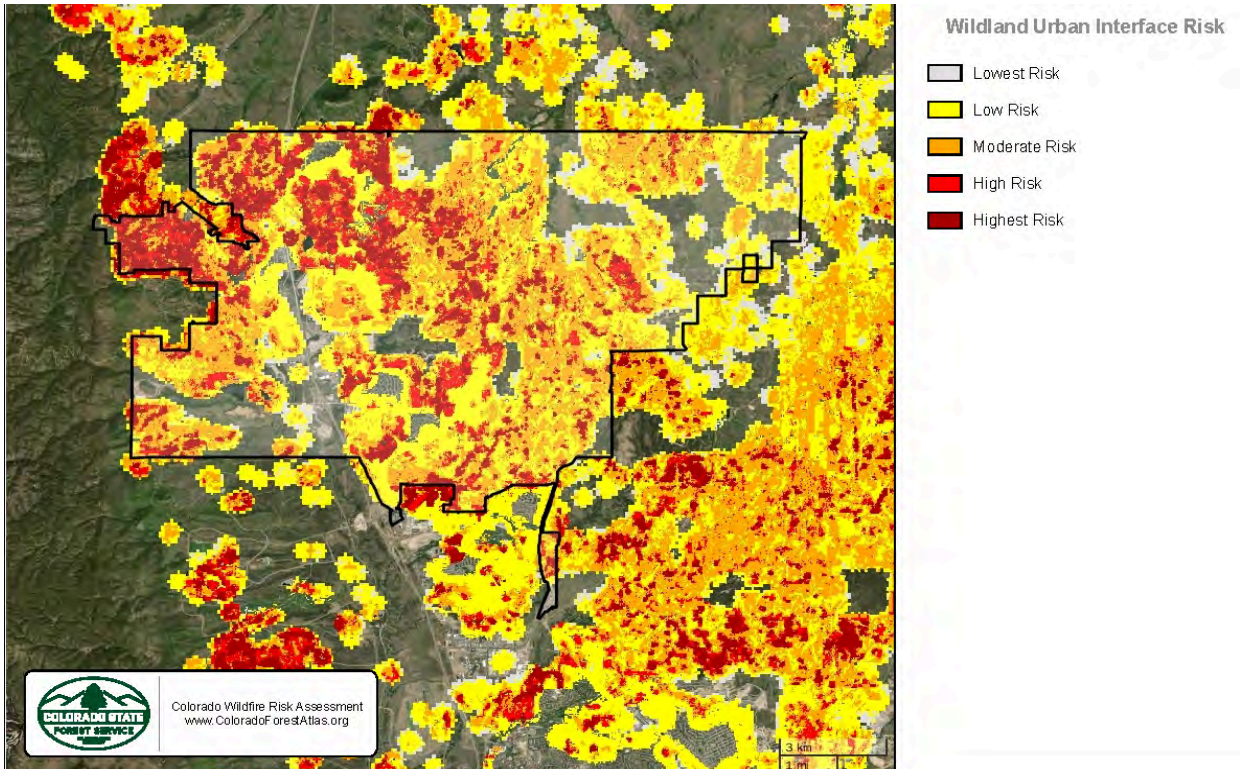
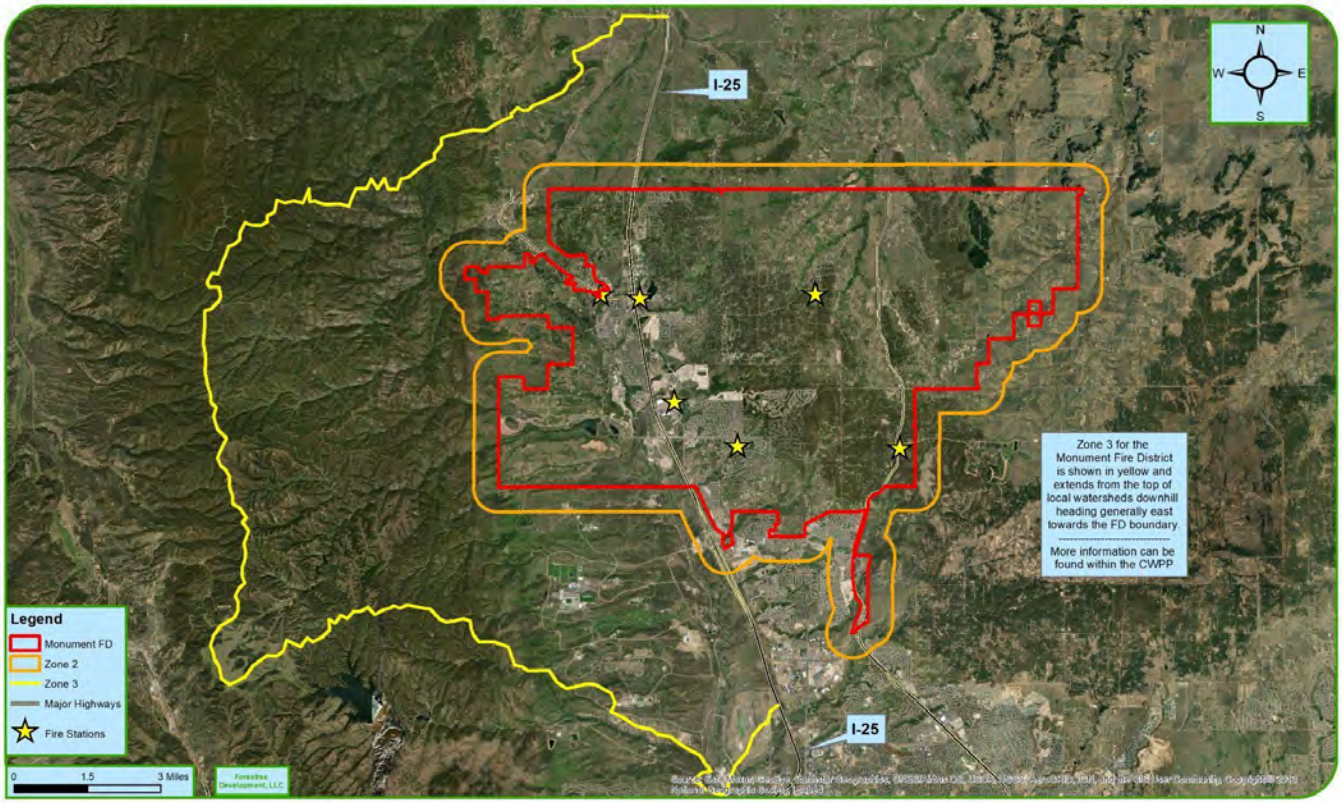


Figure 7. Wildland Urban Interface Risk throughout the Monument Fire District.

1 Carol Ekarius, Executive Director, Coalition for the Upper South Platte. 2013. Personal Communication.

The WUI for Monument was set after meeting with local, state and federal fire officials. These are shown on Figure 8. 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 Monument.

Figure 8. WUI Zones



Zone 1

Zone 1 is the Monument Fire District shown in Figure 7. It consists of the community and is approximately 62 square miles in size. The District is made up of subdivisions, ranch lands, commercial operations, schools and retail shopping centers.

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

In some neighborhoods, removal of trees and vegetation is strictly controlled by Architectural Control Committees (ACC) under the 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. This has been further codified by passage of Senate Bill SB-100 (see Appendix B, SB-100) that mandates all homeowner associations must allow fire mitigation. El Paso County recently passed subdivision regulations requiring a forest management plan on all forested tracts applying for subdivision status. More specific wildfire mitigation planning for Zone 1 is covered in Chapter 4.

Zone 2

Zone 2 is the adjoining Wildland Urban Interface and considered the “Wildfire Impact Zone”. Fires occurring in this zone can have an immediate impact on adjoining properties. The major owners within this zone are The U.S. Air Force Academy, USDA Forest Service (Pike National Forest), and adjoining private lands. This area covers all lands around the District. The western boundary of this zone was set utilizing planning areas outlined as highest priority under the Healthy Forest Restoration Act (HFRA). This is shown as an orange, cross-hatched area in Figure 8, WUI Zones.

The USFS has been actively restoring the forests west of the district for many years. Most recently was a prescribed fire to reduce fuels in the Gambel oak in the area surrounding the Monument Fire Center in the spring of 2024. Portions of the burn directly adjoined Shiloh Pines, and Redrock Valley. Residents of both neighborhoods were able to observe and interact with firefighters during the project.

Projects like the Monument Fire Center prescribed fire had contributions from local fire personnel, private citizens, and private non-profit groups working in conjunction with USFS on federal property. “Good Neighbor Agreements” supervised by Colorado State Forest Service on property abutting federal property may enhance these types of projects in the future.

Zone 3

Zone 3 is the extended area in which watershed and landscape scale wildfires will pose a risk to the community. It is considered the “Wildfire Influence Zone” and includes the watersheds west of the District. The limits of Zone 3 are shown as a heavy red line on Figure 8. A number of constraints were identified through the CWPP process that will hinder fuel treatments. This zone has areas of Preble's jumping mouse habitat. Terrain is also rugged and access limited with some designated roadless areas. However, areas abutting residences and ranches should be treated as possible areas for “categorical exclusions” under HFRA.

The western boundary is generally the west line of peaks that define watersheds flowing south toward the Arkansas River, and its tributaries. Post fire flooding and erosion from wildfires will threaten the property and safety of District residents long after flames are extinguished. The previously designated Front Range Fuel Treatment Project targeted the area for high priority treatment due to impacts to water quality in the Arkansas River Watershed. Unfortunately, a high percentage of lands within Zone 3 are inaccessible or inoperable for treatment.

Wildfire Mitigation Compartments

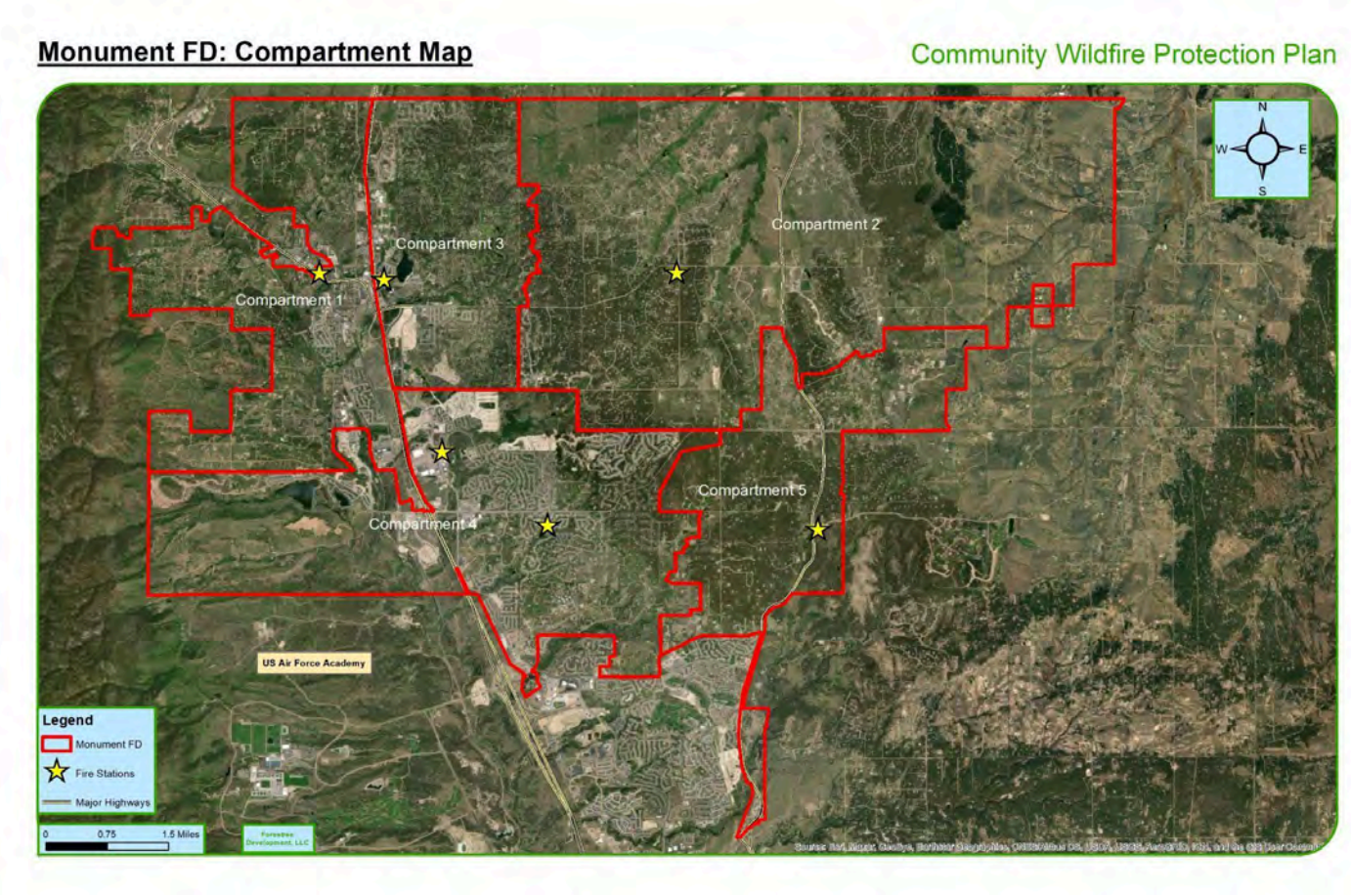


Figure 9. Compartments throughout the Monument Fire District

Division of the District into compartments of similar interest allows neighborhoods to work together in regional mitigation efforts. Efforts on the compartment scale can then be coordinated by the Fire District on a truly regional basis.

Each compartment is described in greater detail beginning on page 27.

Watersheds and Post Fire Flooding

The District and its residents are not only threatened by wildfires in populated areas. Flooding from the Waldo Canyon Fire caused severe damage for several years after the fire was controlled. The watershed surrounding the Monument Fire District extends west to the summit of the Rampart Range. Any fire in the watershed will threaten the District with flash flooding and debris flow for several years until the vegetation and soils recover.

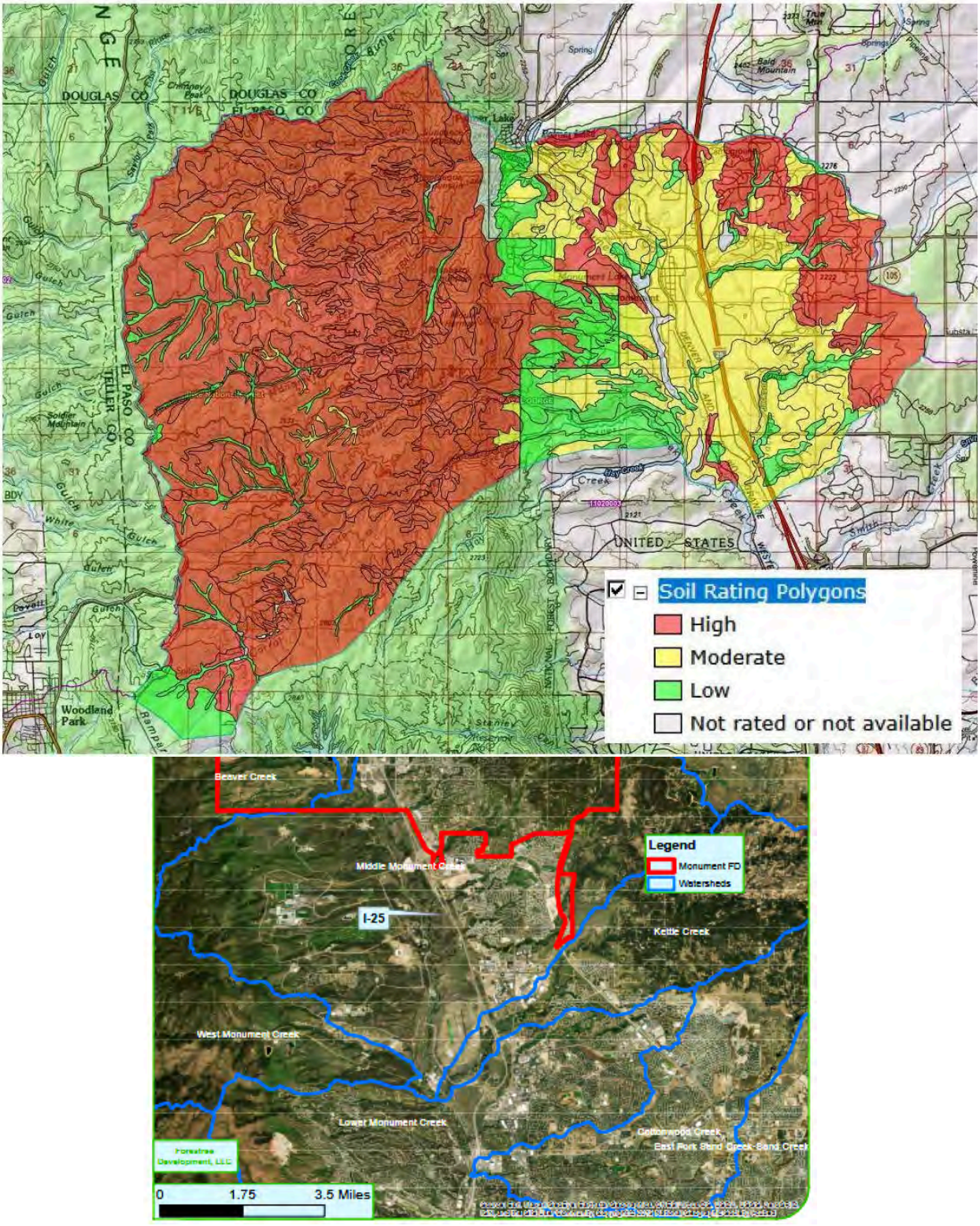


Figure 10. Watersheds in the Monument Fire District

Figure 11. The Potential Damage to Soil map from Fire from the Natural Resources Conservation Service's *Soil Survey for El Paso County Colorado.*

Soils in the watersheds west and east of the MFD are highly vulnerable to damage and post wildfire flooding. Downstream communities will be threatened by flash flooding and debris flow for years after an intense wildfire beyond the District's boundary. Wildfire mitigation is truly a regional endeavor.

Wildfire Crisis Strategy Project Outline

The Wildfire Crisis Strategy ("WCS") Projects on the Pike National Forest are in accordance with the 10-year Wildfire Crisis Strategy and are critical for reaching the final desired outcome of the strategy. The plan will start with a call to Forest Service regional foresters, followed by engaging with other Federal agencies, Tribes, states and other partners, to list projects in high-risk "**firesheds**" that are ready to go, lacking only the necessary funding to begin. More information about the Wildfire Crisis Strategy is available online at:

:https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/Confronting-the-Wildfire-Crisis.pdf

In particular, on USFS lands, they will identify projects to treat fuels and restore forest health at the necessary scale. Fuels are defined as plants, both living and dead, and woody, vegetative materials capable of burning.

The USFS looks for projects that are designed to reduce wildfire risk to communities, water supplies or critical infrastructure (including utility lines, roads and national security sites); critical ecological values including watersheds, wildlife habitat and old-growth stands) and ecosystem services (including carbon storage); economic values (including outdoor recreation, timber and grazing areas); areas of cultural and historic significance (including areas important to Tribes) and areas of social importance to communities (including for access and subsistence use). catastrophic wildfire is the largest threat to these values in the western United States. This strategy and the implementation of this plan will help protect and conserve these values.

Figure 12. Colorado Front Range Fireshed

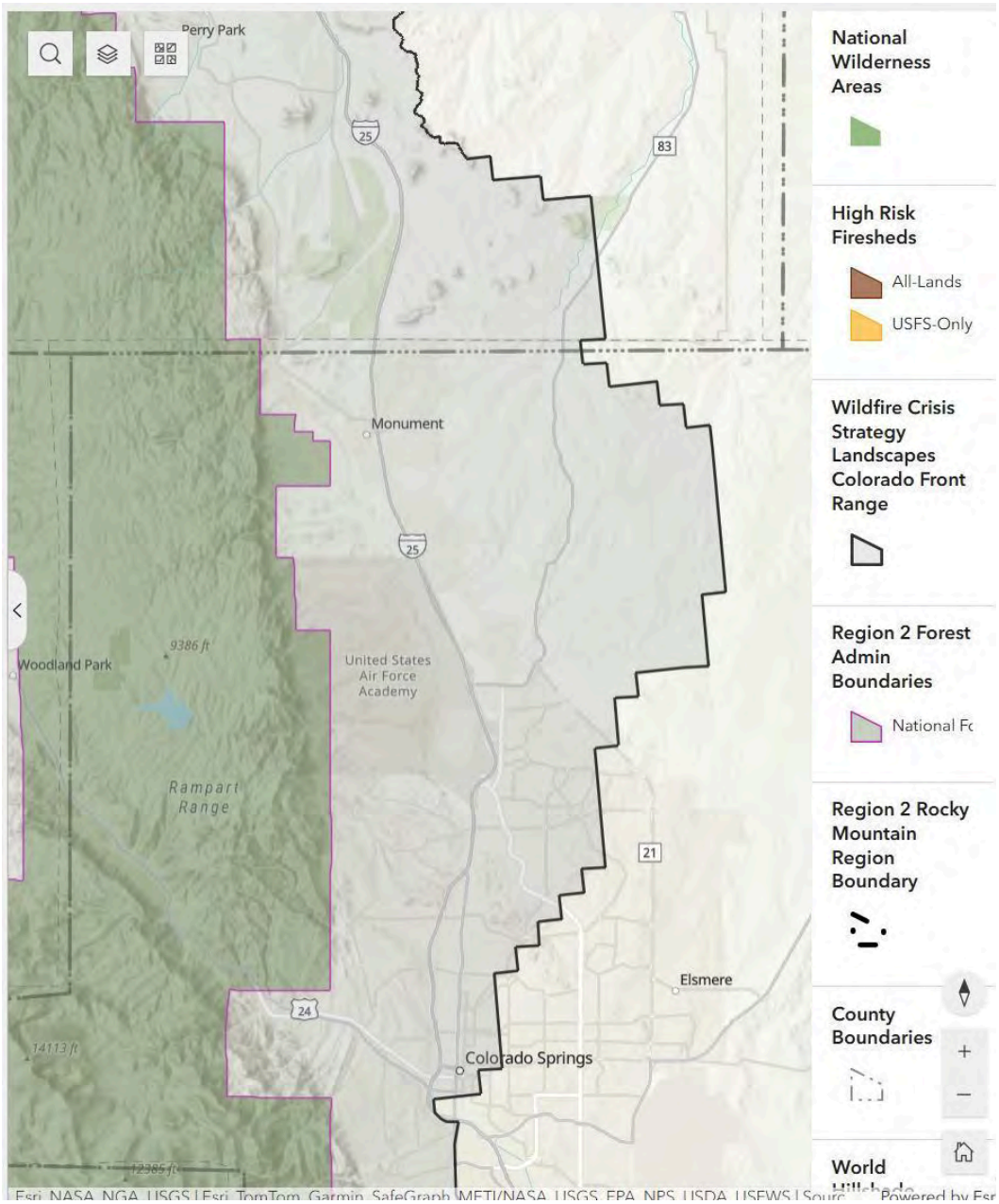


Figure 13. Monument Fire District within the Colorado Springs Fireshed

IV. WILDFIRE HAZARD ASSESSMENT

This section of the Community Wildfire and Protection Plan identifies and prioritizes fuel mitigation treatments for high-risk wildfire hazards impacting Monument Fire District. It also provides a brief assessment of vegetative fuels within the proposed fuel treatment areas.

Vegetation Mapping

The vegetation types found in the District are shown in Figure 14.

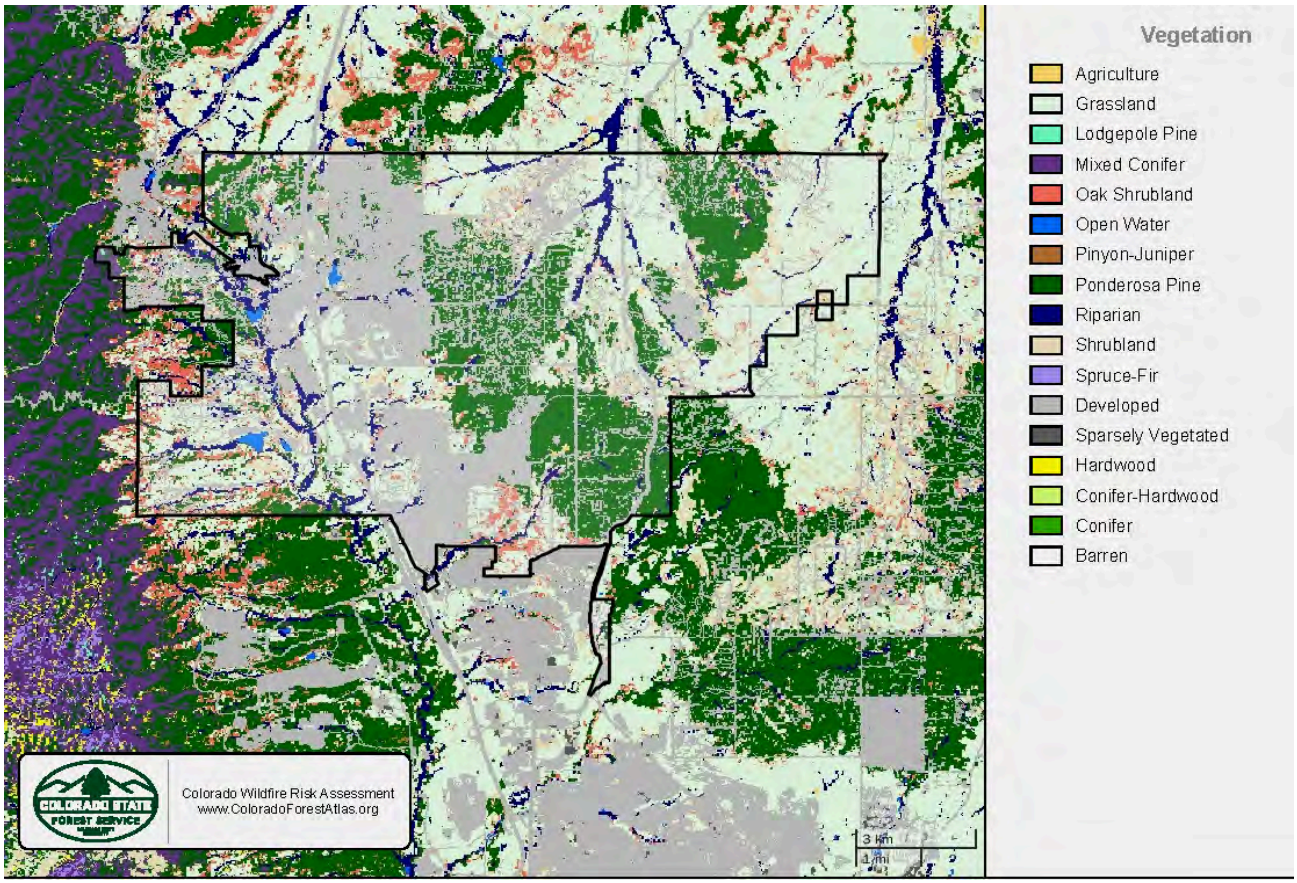


Figure 14. Monument Fire District Vegetation Cover

Vegetation Class	Acres	Percent
Agriculture	104	0.4%
Grassland	7,606	26.2%
Lodgepole Pine	3	0%
Mixed Conifer	59	0.2%
Oak Shrubland	1,051	3.6%
Open Water	98	0.3%
Pinyon-Juniper	88	0.3%
Ponderosa Pine	5,796	20%
Riparian	1,467	5%
Shrubland	2,179	7.5%
Spruce-Fir		0%
Developed	10,510	36.2%
Sparsely Vegetated	69	0.2%
Hardwood	4	0%
Conifer-Hardwood		0%
Conifer	2	0%
Barren		0%
Total	29,035	100%

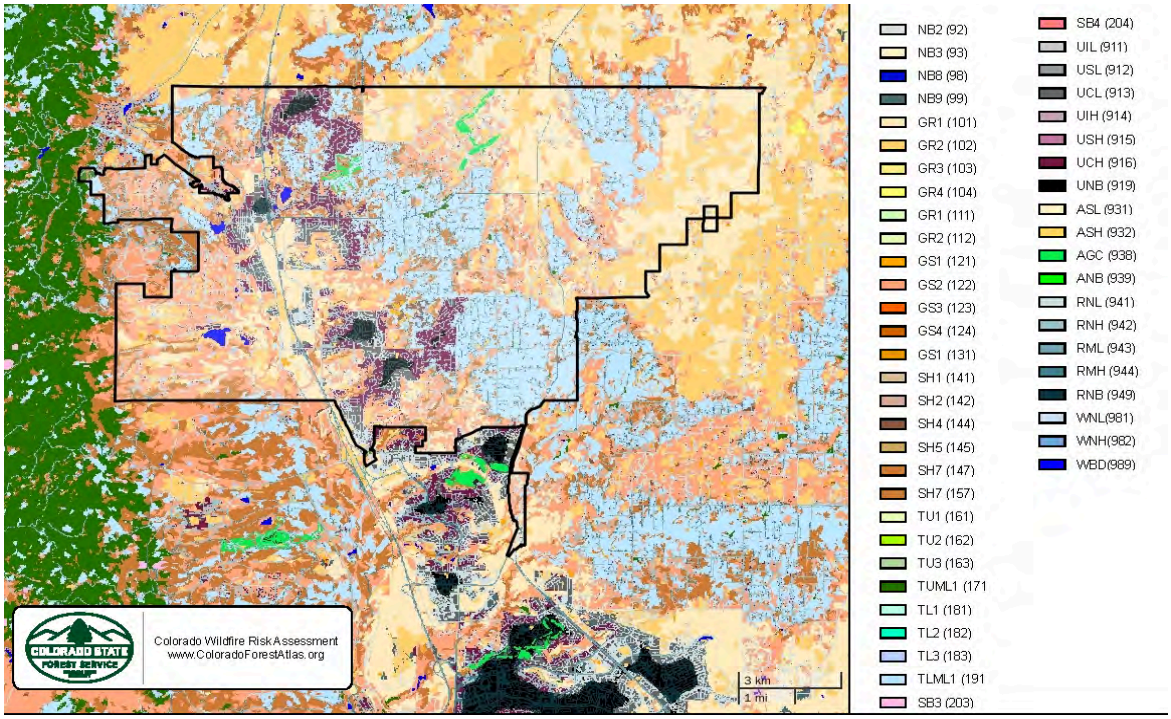


Figure 15. Surface Fuels

Surface Fuels	Description	Acres	Percent
NB2 (92)	Snow/Ice		0%
NB3 (93)	Agricultural		0%
NB8 (98)	Open Water		0%
NB9 (99)	Bare Ground	136	0.3%
GR1 (101)	Short, Sparse Dry Climate Grass	6,004	15.3%
GR2 (102)	Low Load, Dry Climate Grass	4,960	12.6%
GR3 (103)	Low Load, Very Coarse, Humid Climate Grass		0%
GR4 (104)	Moderate Load, Dry Climate Grass		0%
GR1 (111)	Short, Sparse Dry Climate Grass - ALPINE		0%
GR2 (112)	Low Load, Dry Climate Grass - ALPINE		0%
GS1 (121)	Low Load, Dry Climate Grass-Shrub	118	0.3%
GS2 (122)	Moderate Load, Dry Climate Grass-Shrub	7,531	19.2%
GS3 (123)	Moderate Load, Humid Climate Grass-Shrub		0%
GS4 (124)	High Load, Humid Climate Grass-Shrub		0%
GS1 (131)	Low Load, Dry Climate Grass-Shrub - ALPINE		0%
SH1 (141)	Low Load Dry Climate Shrub		0%
SH2 (142)	Moderate Load Dry Climate Shrub	18	0%
SH4 (144)	Low Load, Humid Climate Timber-Shrub	96	0.2%
SH5 (145)	High Load, Dry Climate Shrub		0%
SH7 (147)	Very High Load, Dry Climate Shrub	1,279	3.2%
SH7 (157)	Very High Load, Dry Climate Shrub	1,476	3.8%
TU1 (161)	Low Load Dry Climate Timber-Grass-Shrub		0%
TU2 (162)	Moderate Load, Humid Climate Timber-Shrub		0%
TU3 (163)	Moderate Load, Humid Climate Timber-Grass-Shrub		0%
TUML1 (171	Timber Understory Dynamic ML (TSYL 2022)	79	0.2%
TL1 (181)	Low Load Compact Conifer Litter		0%
TL2 (182)	Low Load Broadleaf Litter		0%
TL3 (183)	Moderate Load Conifer Litter	76	0.2%
TLML1 (191	Timber Litter ML (TSYL 2022)	7,025	17.9%

Surface Fuels	Description	Acres	Percent
SB3 (203)	High Load Activity Fuel or Moderate Load Blowdown	1	0%
SB4 (204)	High Load Blowdown		0%
UIL (911)	Isolated urban surrounded by Low FB fuel		0%
USL (912)	Scattered urban surrounded by Low FB fuel		0%
UCL (913)	Urban core surrounded by Low FB fuel	720	1.8%
UIH (914)	Isolated urban surrounded by High FB fuel		0%
USH (915)	Scattered urban surrounded by High FB fuel		0%
UCH (916)	Urban core surrounded by High FB fuel	1,897	4.8%
UNB (919)	Unburnable urban areas	252	0.6%
ASL (931)	Agricultural Low Load Fuels, with seasonal changes of its Burnable condition		0%
ASH (932)	Agricultural High Load Fuels, with seasonal changes of its Burnable condition	134	0.3%
AGC (938)	Golf courses - Non-Burnable (no encroachment)	175	0.4%
ANB (939)	Agricultural Fields, maintained in a Non-Burnable condition		0%
RNL (941)	Minor roads Low FB	3,165	8%
RNH (942)	Minor roads High FB	3,159	8%
RML (943)	Major roads Low FB	224	0.6%
RMH (944)	Major roads High FB	504	1.3%
RNB (949)	Roads surrounded by non-burnable fuels	142	0.4%
WNL(981)	Minor Water streams surrounded by Low Load Fuel (moderate encroachment)		0%
WNH(982)	Minor Water streams surrounded by High Load Fuel (high encroachment)		0%
WBD(989)	Water Bodies	135	0.3%
	Total	39,304	100%

48/70

Topography

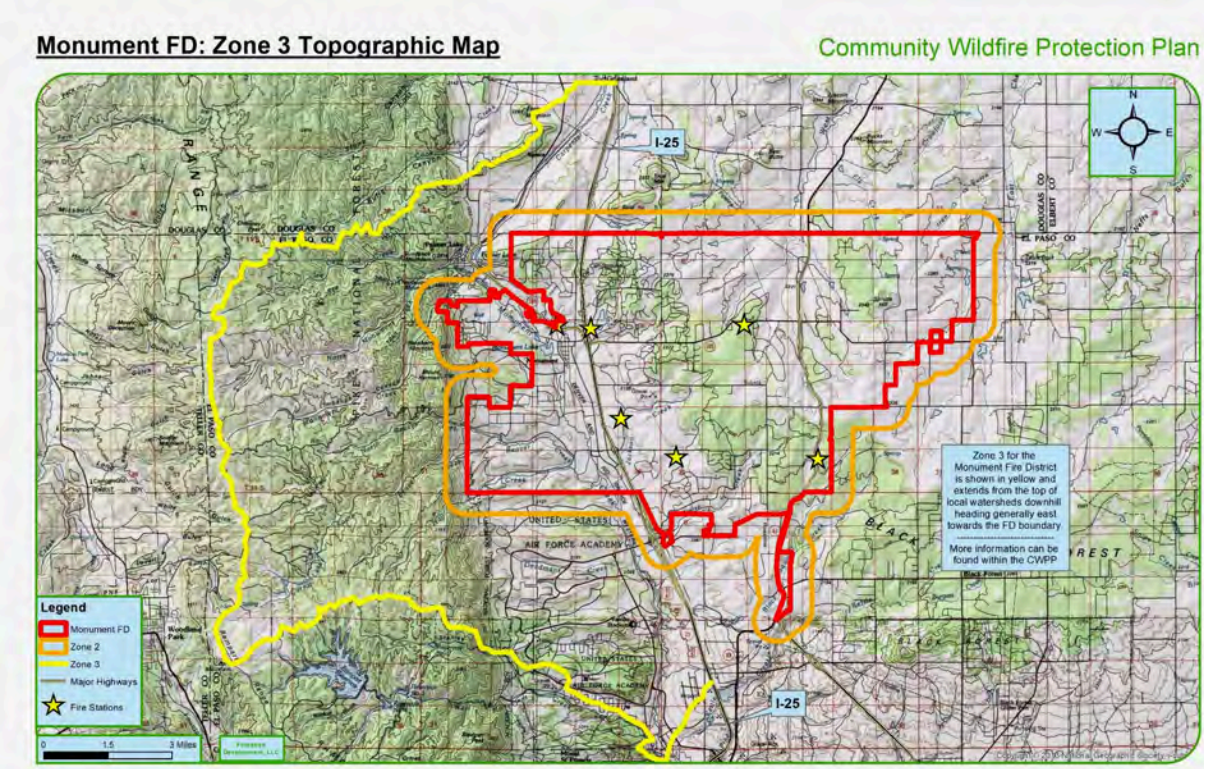


Figure 16. Topography

Much of the District is rugged terrain. Topography has a major impact on fire behavior. General topography of the District is shown in Figure 16.

More detailed topo maps for each compartment are included in the appendices.

Fuel Treatment Priorities

The following is a list of recommended priorities for fuel treatments within Monument:

1. Ingress/Egress Routes- Evacuation will be critical. Many roadways were found to be narrow and with significant fuel volumes along their routes.

2. Individual structures- No amount of fuel treatments around residential areas will be effective if homes are not defensible. All residents are responsible for the development of both defensible space and home ignition zones around their structures.

3. Potential Refuge Zones and Staging Areas- Evacuation may not always be possible. Zones of heavily treated fuels in close proximity to roadways should be created. In some communities, this can be as simple as regular mowing. In others, heavy fuel volumes should be treated along roadways or key intersections. These predetermined zones may also allow for more orderly evacuation and ingress of firefighting resources.

4. Areas with heavy concentrations of homes. Residential areas, subdivisions and enclaves of homes will need to treat areas beyond a normal home ignition zone; especially in areas with heavy fuels. Treatment goal will be to reduce crown fire potential, lower fire intensity such that limited manpower and resources can protect higher numbers of homes. Prescribed fire should be considered as a tool for protecting communities.

5. Areas with lower concentrations of homes. Each residence will typically have sufficient area to complete both a defensible space and home ignition zone. The goal should be the same as Number 4 above and allow for prescribed fire use for protecting structures.

6. Rural areas/Ranches-Owners will need to complete defensible space and ignition zones around all structures, including barns and outbuildings. A backup water supply is recommended.

7. In most areas of the District, safe evacuation or safe access for firefighters is compromised by heavy fuels adjacent to the rights of way. The rights or way along most roads are narrow, and effective ruel reduction requires treatments on adjoining private land.

8. The Fire District may facilitate work projects with private landowners adjacent to road rights of way areas as well as private lands in general to promote mitigation along the evacuation and ingress routes.

9. Roadside fuel treatments should meet standards as specified by the Colorado State Forest in its *Fuelbreak Guidelines for Forested Subdivisions* (See Appendix G).

"*Connection*" is a term used to describe fuel treatments that "*connect*" natural areas with light or no fuel content (e.g., rock ridges, riparian, etc.). These may also be fuel treatments that "*connect*" more widespread areas of mitigated fuels. "*Connection*" breaks are recommended in areas of heavy home development/structures to assist in home area protection without destroying the environmental esthetics of the area. (See Appendix G, *Fuelbreak Guidelines for Forested Subdivisions*, for descriptions and rationale for building fuel breaks.)

Connection is consistent with USFS concept of Potential Operation Delineations (PODs) developed as a strategy for influencing wildfire behavior on a landscape scale.

For undeveloped areas within Monument, such as specific areas within dense, untreated forests, potential mitigation would cover a much broader expanse of land than the wildfire fuel treatments considered for protecting developed properties. An example of fuel treatments proposed by this plan is shown in Figure 17.

Figure 17. Sample fuel treatment done on USFS lands.

Compartments

This Community Wildfire Protection Plan divides Monument into five compartments. Within each compartment, "*connection*" fuel treatments should be prioritized by wildfire impact risk and assigned a label, identifying the compartment area, and the mitigation priority. The fire hazard class will use the five-classifications utilized by the Colorado State Forest Service (See Appendix C, *Fire Hazard Classes and Fuel Models*).

Compartments are recommended as a planning tool to lay out fuel treatments that can either contain fire or prevent spread to other compartments. Clusters of homes, key roads and topographic features were used for establishing all seven compartments. Again, these are consistent with the implementation of PODs, but on a smaller scale.

Compartment 1

Compartment one is in the northwest corner of the District west of Interstate 25. It includes the Town of Monument with its homes and commercial buildings,and many surrounding subdivisions. Fuels vary from urban landscaping to ponderosa pine and Gambel oak. The highest priority in this zone is to protect homes, businesses, and major transportation routes such as Interstate 25.

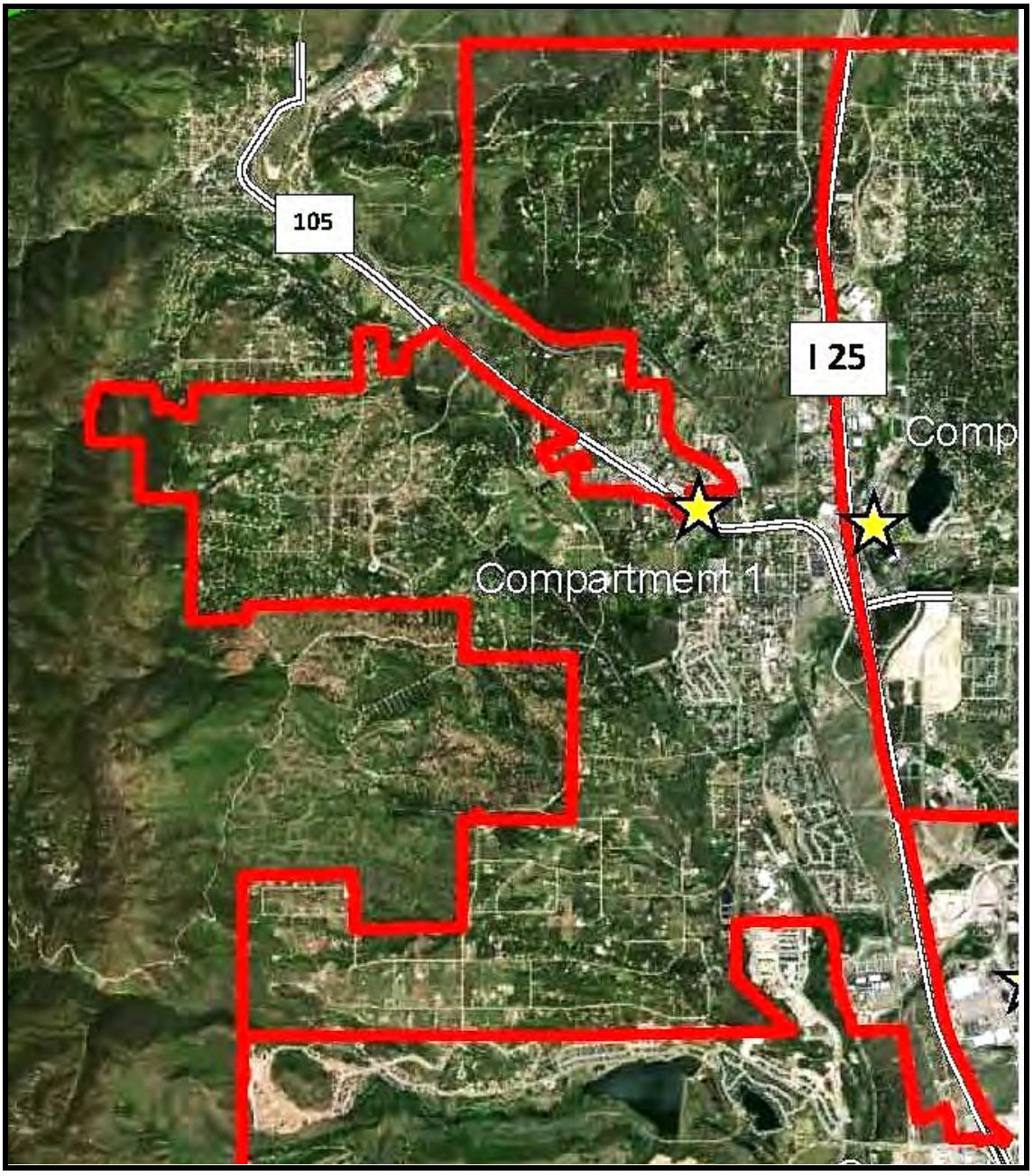


Figure 18. Compartment 1

Compartment 2

This compartment comprises the northeast corner of the District. Roughly from Furrow Road to the eastern District boundary and from the Douglas County line south. Highway 105/Walker Road, and State Highway 83 form the primary travel routes through the compartment. There are several subdivisions and much open land in the compartment. Fuels range from ponderosa pine to Gambel oak and extensive areas of grass.

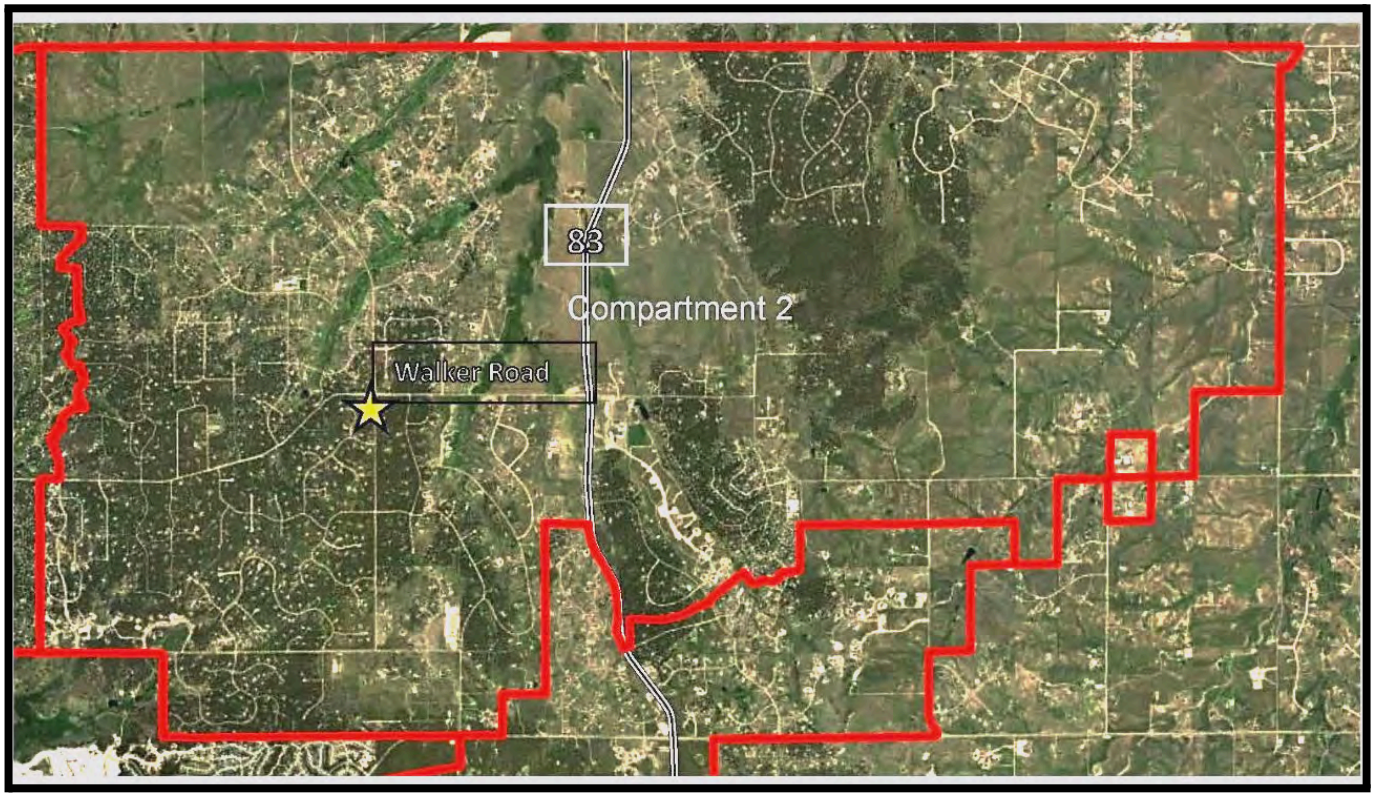


Figure 19. Compartment 2

Compartment 3

Compartment Three generally coincides with the boundaries of Woodmoor. Woodmoor is a high hazard area of great concern due to the dense housing and high population. Woodmor has a longstanding program of mitigation and a CWPP specific to the community. The principle concerns in Woodmoor are structural ignitability, evacuation safety, and protection of the environment.[2] Primary fuel types in Compartment Three are ponderosa pine, Gambel oak and urban landscaping. This compartment also includes commercial structures along Highway 105 east of Interstate 25.

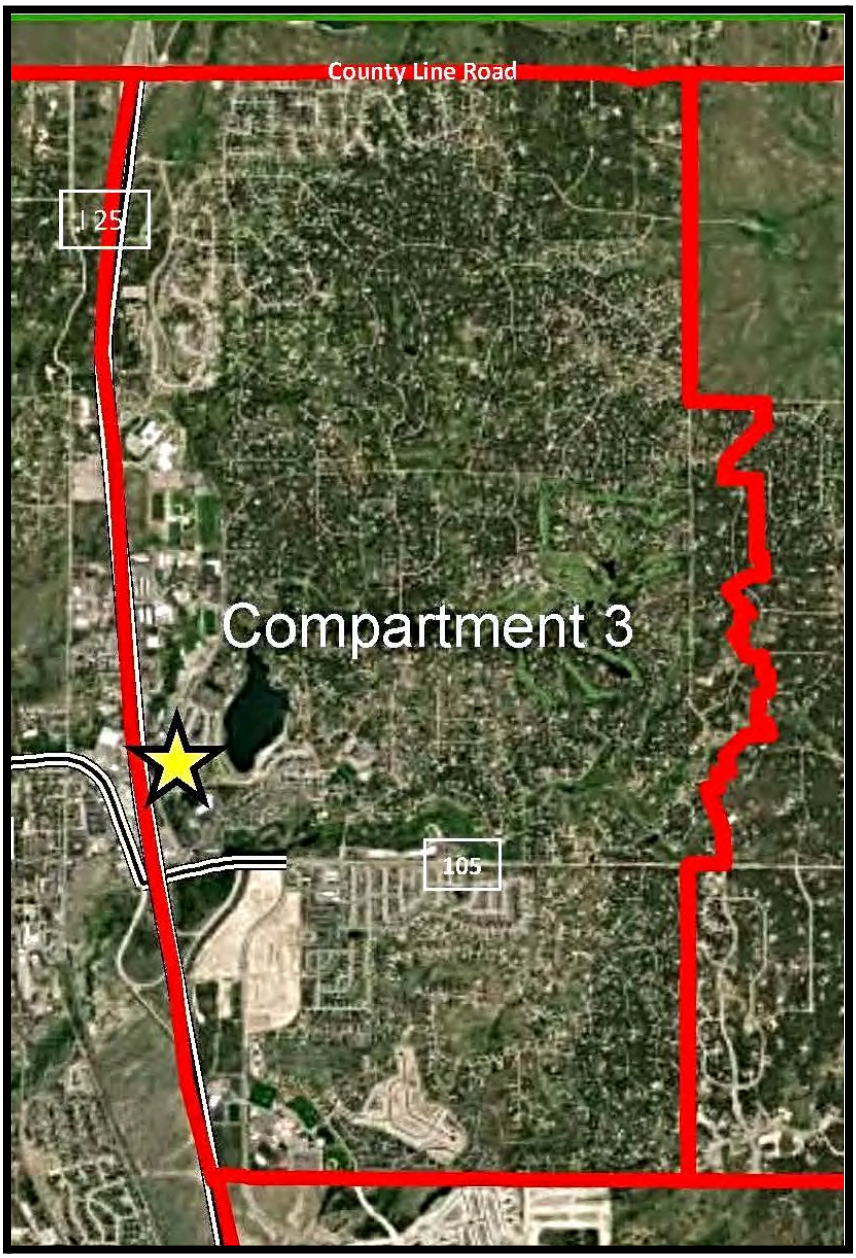


Figure 20. Compartment Three

2 Woodmen James, Edwards Miller (2017). *Updated Forest Stewardship and Community Wildfire Protection Plan,* Woodmoor Improvement Association .https://csfs.colostate.edu/wp-content/uploads/2018/03/Woodmoor_2017_CWPP_Final-1.pdf

Compartment 4

Compartment Four is in the southwestern corner of the Fire District. West of Interstate 25, It is bounded on the south by the Air Force Academy on the south. This section of the compartment is currently being developed to a housing development with homes on urban densities. The western boundary is Pike National Forest. The principle fuel type here is Gambel oak, but as development proceeds landscaping may become the largest fuel type, particularly if firewise landscaping is not required.

East of Interstate 25, the compartment is developed into urban density neighborhoods and commercial properties along Interstate 25. Here the southern boundary is with the City of Colorado Springs, Fuels here are Gambel oak, some ponderosa pine and urban landscaping. important travel routes through the compartment are Baptist Road and Jackson Creek Parkway.

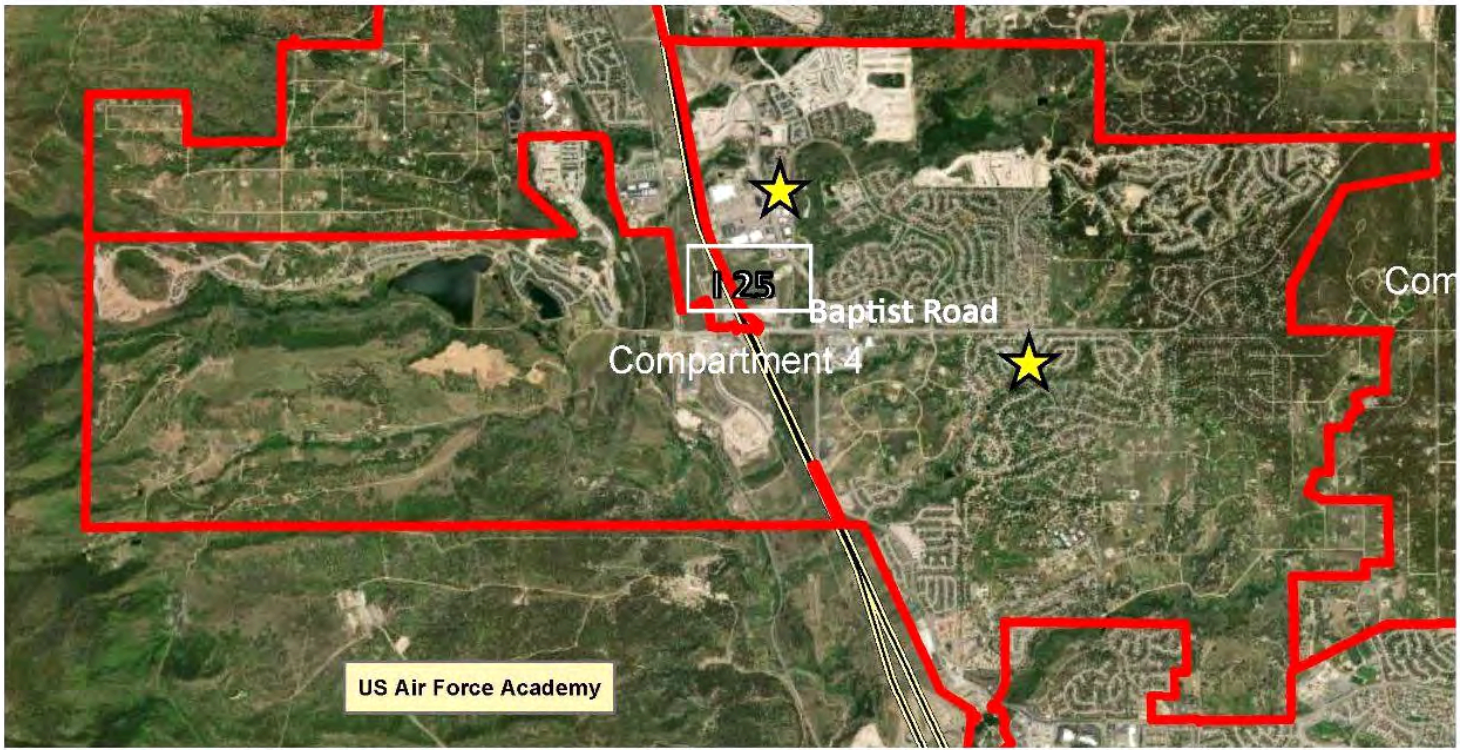


Figure 21. Compartment Four

Compartment 5

Compartment Five is in the southeastern corner of the District. It encompasses the eastern portion of the former Donald Wescott Fire Protection District and areas formerly in the southeast corner of the Monument FD. To the east, the boundary abuts the Black Forest Fire District, and the City of Colorado Springs forms the southern boundary. The primary fuel type is ponderosa pine and some grass.

Included within this compartment are Fox Run Regional Park, Shamrock Ranch, and the Benet Hill Monastery and nursing facility. All three of these properties are involved in wildfire mitigation. This compartment is the only area of the Monument Fire District that was burned in the Black Forest Fire.

The main travel routes through this compartment are Highway 83 and Hodgen or Baptist Road. It is important to note that the Wescott FPD, in cooperation with Shamrock Ranch and the Colorado Department of Transportation, did extensive mitigation work along the portion of Highway 83 on the ranch property. This provides a visible example of how potential escape routes should be properly mitigated.

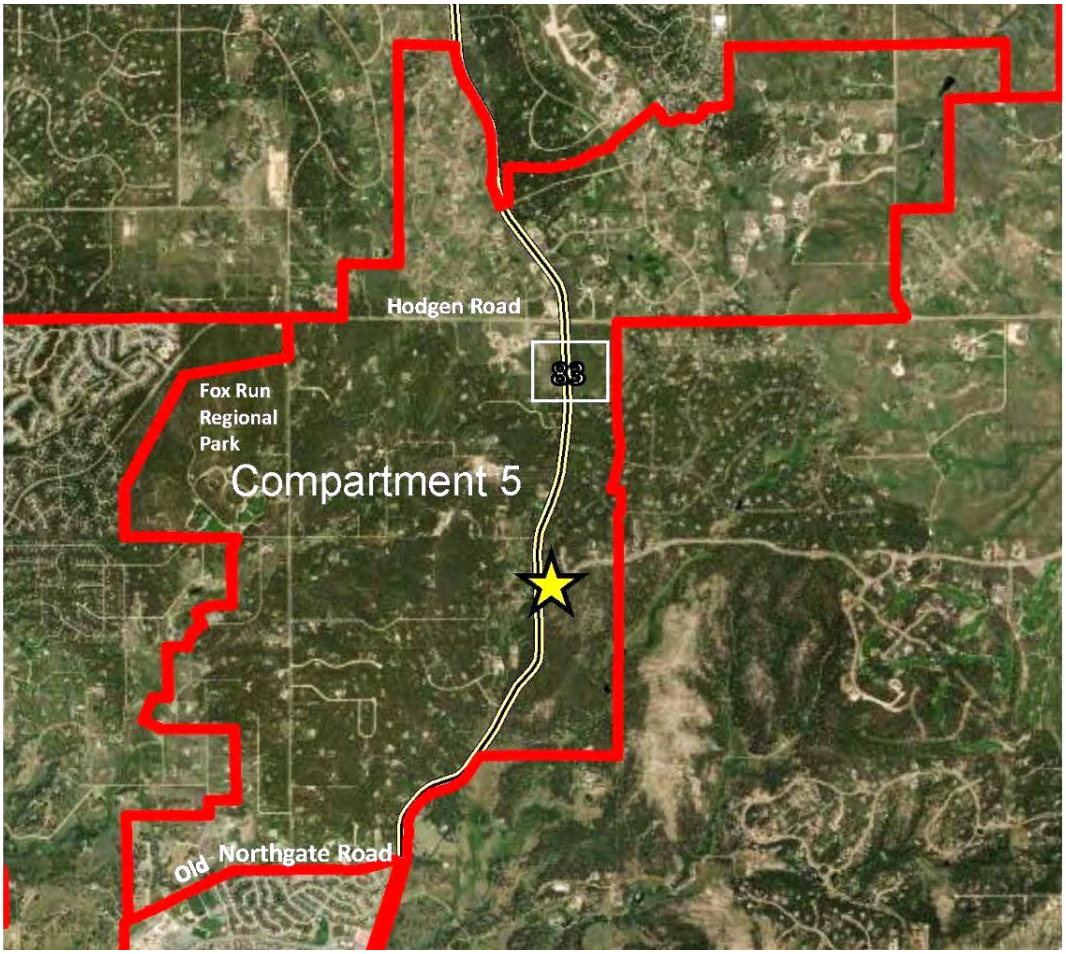


Figure 22. Compartment Five

Three Proposed Mitigation Strategies

The Monument CWPP recommends three strategies for effecting fuel mitigation for proposed projects. The application of a specific strategy will have to be based upon the ownership and developed or undeveloped aspects of the property proposed for mitigation. The basis of any strategies will be two-pronged: cost and legal.

Road Rights of Way

For properties on which El Paso County possesses rights of way, or on properties directly owned by an HOA, mitigation work may be funded by El Paso County, Monument FD and/or the HOA. This funding will either come from direct funding or through State or Federal grant monies applied for and received by Monument or others.

Private Homeowner and Landowner Properties

Monument FD neither has auspices nor declaration of use of private properties within its boundaries. Therefore, fuel mitigation on private properties, although highly encouraged by the Fire District, is the responsibility of the property owner. However, Monument 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,
- Demonstration projects.
- Possible mitigation slash disposal site air curtain burner or other disposal method.
- *Firewise Household Tips.*
- *Property Mitigation and Protection*.

In private lands adjacent to a road right of way fuel mitigation, owners are encouraged to work with the District to attain a more effective fuelbreak by "*feathering*" the fuelbreak into their property. Such work should meet Colorado State Forest Service standards (See Appendix C, *Fire Hazard Classes and Fuel Models*).

Undeveloped, Publicly-owned Properties

Monument will work with NGOs, State and Federal agencies to treat lands adjacent to private land that pose a threat to structures and public safety. Monument should strongly encourage the El Paso County Board of County Commissioners to enact ordinances to require property owners and land developers to *pre-mitigate* fuels on high-risk wildfire properties to be developed. This *mitigation* should be required prior to allowing the building of structures (See Chapter 8, *Implementation Plan*). There appears to be some degree of acceptance by developers to this community protection strategy since some developers see the marketability of treated properties. Monument should assess potential in-fill areas that may be planned in these currently undeveloped but prime real estate areas (See Chapter 8, *Implementation*).

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 prior to mitigation being performed. The objective of any fuel reduction practice is not to randomly remove fuel. Rather, it is to restore the forest to a healthy, fire adapted condition. As indicated in Appendix G, *Fuelbreak Guidelines for Forested Subdivisions*, care will be given to assure environmental and aesthetic values of the immediate and surrounding area are improved as well.

Vegetation Analysis

Current analysis of the density and varieties of vegetation is an integral part of deciding when to schedule projects. Vegetation mapping can be kept simple and follow very simplified Colorado State Forest Service Fuel Mapping categories. It should be noted this "simple" system was developed years ago for use by planners and laypersons with little or no wildfire background. Although the ratings are old, the fuels have changed little. The greatest change over time is the increase in structures built in high hazard areas. These should be augmented by USDA Forest Service **National Fire Danger Rating System (NFDRS) designations** (General Technical Report INT-39) or "Anderson's Aid to Determining Fuel Models for Estimating Fire Behavior."

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 east 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 east Compartment. (NFDRS Fuel Model L. Areas with more than 1/3rd rabbitbrush cover should be Fuel Model T.)
- B- Medium fuels like those found along the riparian areas such as willows and other shrub mixes. (NFDRS Fuel Model E after leaf drop and Fuel Model R after trees have leafed out.)
- **C-** Heavy conifer tree areas found in most areas of the Fire District. These tend to be predominantly ponderosa pine. Some areas may contain a Douglas-fir and Ponderosa Pine mix,. Many areas have dense stands of ponderosa with Gambel oak in the understory. (NFDRS Fuel Model G if untreated. Treated stands, thinned and ladder fuels removed, could be considered as Fuel Model H.)

More exact fuel mapping should be done as individual projects are planned.

Scheduling

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

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

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

V. PRESCRIPTIONS FOR WILDFIRE HAZARD REDUCTION

Figure 23. Diagram of Home Ignition Zone (Source: CSFS)

In a broad sense there are two generalized categories of mitigation around structures. First is defensible space thinning in the Home Ignition Zone around structures to increase the chance that the structure will survive a wildfire. Second, is fuel break thinning away from structures to reduce severe fire behavior and give firefighters a safer place to work and possibly halt an approaching wildfire. Both approaches require thinning of the canopy and removal of ladder fuels. The approach will vary depending on the specific forest conditions existing in the area in question.

THE HOME IGNITION ZONE:

Modification of vegetation around a structure to reduce fire intensity is called defensible space. The term "home ignition zone" (HIZ) is defined as a structure and the surrounding vegetation. A structure's vulnerability to wildfire depends on the condition of surrounding vegetation, landscaping, and the structure itself.

Thinning around homes is different from thinning for fuel breaks. Thinning in the HIZ is designed to protect structures from the heat of wildfires. Defensible space includes both thinning for defensible space

around structures to reduce the heat from burning vegetation, and reducing combustibility of the structures to protect them from wind borne embers (firebrands), radiation and convective heat.

Information is available at the Colorado State Forest Service website:

www.csfs.colostate.edu

A direct link to the newest Home Ignition Zone guidelines is:

https://csfs.colostate.edu/media/sites/22/2021/04/2021_CSFS_HIZGuide_Web.pdf

NOTE: Homeowners should always follow state and national guidelines since these may be updated based on recent science. Tips/action sheets can be done, but always based on most current recommendations.

Defensible space is defined as an area around a structure where existing vegetation is modified to slow the spread and reduce the intensity of an advancing wildfire. Basically, this is the area where firefighters must have space to work safely. This includes selective removal of trees around structures in two or three concentric management zones. On slopes, increase the width of each zone on the downhill side. Fuels are reduced according to prescriptions for each zone.

Zone One:

This is the closest zone to a structure and extends 0-5 feet from the outermost edge of a structure including any decks. The management goal is to reduce or eliminate most large trees or shrubs within this zone so that the convective heat will not ignite the structure. A few tall trees may be left in zone one if the lowest branches are pruned so that they are well above a fire-resistant roof. It is best to limit this to one or two trees near a structure. Treat such trees as part of the structure and create 15 feet of space outside the tree to the next tree.

While it is necessary to remove combustible material in zone one within five feet of foundations and under decks, it is not necessary to do so elsewhere. Needles on the forest floor act as mulch retaining moisture in the soil, reduce erosion, and add organic matter to the soil as they decay. If regeneration of new trees is an objective, however, it is desirable to expose some bare soil since this will promote seed germination and establishment. *Raking up pine needles is not a substitute for thinning and ladder fuel removal.*

Zone Two:

The width of zone two depends on the slope around the house. If the average slope angle is less than 5%, zone two extends out 30 feet from the foundation. As slopes increase, increase the width of zone two on the downhill side of the house, and increase the spacing between tree crowns.

The main fuels reduction guideline for zone two is to thin the trees to an average spacing of 10-feet crown separation. Clumps of two or three trees may be retained in this zone if the space between the clump and the adjoining trees is at least 30 feet. All ladder fuels under trees should be removed. The branches of large trees should be pruned to a height of 8 feet above ground, but small trees should have at least

two-thirds of the green needles remaining. Leaves and conifer needles should be kept to a minimum in this zone.

Firefighters must be able to escape quickly if conditions suddenly deteriorate. Zone two should extend along both sides of driveways for a width of 30 feet from each edge of the drive. This is important to allow safe access and egress for emergency vehicles. Adequate clearance should be maintained to allow access for large structural fire trucks. Twelve feet of horizontal clearance and 15 feet of vertical clearance should be maintained. At the end of driveways, adequate room for a large fire engine to turn around should be maintained (Figure 24). Recommended dimensions are shown in the detail below.

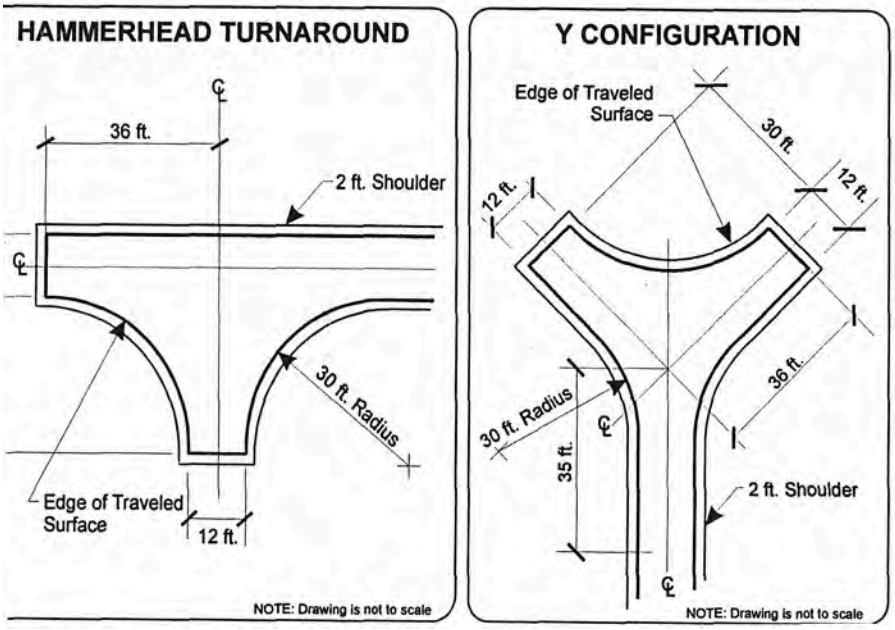


Figure 24. Fire Engine Turn-around Requirements (Source: Boulder County Regs)

Zone Three:

Zone three extends from the outer edge of zone two to 100 feet from the structure. The guideline for zone three on flat ground is to thin the forest primarily to improve forest health and create at least 10 feet between tree crowns. Tree crown spacing should be increased as slopes increase. Spacing is less critical in this area but spaces should be made in the canopy. A useful rule of thumb is that, generally, a tree's branches should not touch or intermingle with branches of adjacent trees.

Thinning in zone three is often considered an afterthought compared to zones one and two. Thinning in zone three is usually recommended as a form of forest stewardship rather than fire mitigation. Management and thinning in this area are critical to fire mitigation on a community wide basis since it connects the defensible spaces into an integrated whole. Note: Leaves and pine needles should be left in place to protect forest soils as a natural mulch layer to hold in soil moisture and moderate soil temperatures. Maintain at a depth of 4 to 6 inches and only remove where concentrations exceed 6 inches.

HOW STRUCTURES CATCH FIRE

There are three ways that a wildfire can transfer itself from natural vegetation, or burning homes, to other homes. They are through radiation, convection, and firebrands.

Radiation:

Wildfires can spread to a home by radiating heat in the same way a radiator heats rooms in the wintertime. Radiated heat can ignite combustible materials from a distance of 100 feet.

Convection:

Direct contact with flames, or the wildfire's convective heat column—the hot air and gasses rising from the flames--may also ignite a home. This will most likely occur when landscaping, trees or brush near a structure ignite, and the flames touch a flammable part of the structure.

Firebrands:

Firebrands are burning materials that detach from a fire during strong convection drafts in the burning zone. Embers in other words. In most cases, the flame front passes quickly, but a shower of embers impinges on the structure for some time before and after the flame front passes. Firebrands are most often the cause of home loss. Firebrands can be carried long distances – more than a mile – by the winds associated with a wildfire. Many homes in communities are particularly vulnerable to firebrands.

Figure 25. Unburned trees in the background indicate that the home in the left photo, burned in the Black Forest Fire, was ignited by embers. Only a block away, the home on the right with proper mitigation and structural hardening survived the fire without damage.

The 2002 Hayman Fire burned 138,000 acres and 132 homes in 20 days. After Hayman, the homes burned were thoroughly studied to determine the manner in which they were burned. USDA Forest Service scientists Jack Cohen and Rick Stratton reported on the causes of home destruction in the *Hayman Fire Case Study*.[3] Surprisingly, 662 homes within the perimeter of the fire were not destroyed. Many of the homes that survived did so without intervention by firefighters. The study objective was to determine if there were common factors among these surviving homes that might be helpful in preventing loss of homes in future wildfires.

They found that "torching" or intense crown fires within 30 feet of a structure destroyed 70 homes. If a house was destroyed but the surrounding trees did not burn, they assumed that embers or firebrands ignited it. Based on this logic, they concluded that 62 (47%) of the 132 homes destroyed in the Hayman Fire were ignited by surface fires or firebrands.

Cohen and Stratton found that home destruction was related more to a house and its site-specific surroundings than to the context of the larger Hayman Fire. If the vegetation around a house allowed high intensity fires to burn near them, they did not survive. If the vegetation permitted only low intensity fires, the structures had a good probability of surviving. Flammability of roofs, siding materials, and other house construction features raised or lowered the risk of flames igniting homes.

HOME CONSTRUCTION AND VULNERABILITY TO WILDFIRE:

The construction materials, location and even the shape of a structure influence its vulnerability to wildfire.[4] It is not the intent of this CWPP to suggest extensive alterations to homes that already exist in the community. Understanding how home construction affects the vulnerability of the structure to a wildfire helps residents plan defensible space projects to compensate for construction differences. When remodeling or home improvement projects are done plans can be made to reduce the ignitability of the buildings.

Decks and roofs are the most vulnerable parts of a structure. If either burns, the home will be lost. They are most likely to catch windblown firebrands, and air currents are more likely to form eddies that trap heat in the irregular surfaces found in roofs and decks.

Fire restive roofs are extremely important. *Wood shake roofs are the cause of many home losses due to firebrands.* Roof material with a class A rating indicates the best resistance to fire. Many roofing materials are available to homeowners, but they vary in cost, weight and longevity. Homeowners should consult with a reputable building contractor to determine which roofing material will best suit their needs.

Even the most fire-resistant roofs require maintenance. The most important item is to keep the roof—and gutters--free of debris. Combustible debris such as leaves and pine needles may ignite from firebrands and start the home on fire even with a class A roof. Combustible litter is most likely to accumulate in areas where one shape meets another such as gables and dormer windows. Gutters will also accumulate debris. These same areas are most likely to accumulate firebrands because of eddies in wind currents during a wildfire. Combustible debris should be removed anytime it accumulates.

Many homes in the District have metal roofing that is a class A roofing material. However, home autopsies have shown that the small ridges in metal roofs where one panel overlays another can be openings where fire brands may collect directly on the plywood sub roof, leading to ignition of the plywood. The holes underneath such ridges should be plugged with caulking or a similar material. Homes with Spanish tile roofs should likewise have tiles, called bird blockers, inserted in the gaps in the tile edges to prevent ember entry.

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[3] Graham, Russell T., (2003): *Hayman Fire Case Study.* USDA Rock Mountain Research Station, Report RMRS-CTR-114.

[4] Slack, Peter, (2000): *Firewise Construction: Design and Materials.* Colorado State Forest Service.

The eaves (the extension of the roof over the outside wall) are also vulnerable areas. Open eaves, with the roof joists exposed, are particularly vulnerable because the irregular surfaces can trap hot gasses and fire brands. Enclosure of exposed eaves (called a soffit) helps prevent this. It is best to construct soffits so that the lower edge of the soffit meets the wall at a 90° angle. This reduces the amount of heated air and fire brands that might be trapped.

Vents, in roofs and foundations, are also areas of vulnerability, but are necessary to ventilate attics and crawl spaces to prevent moisture accumulation. During a wildfire, heated gasses and firebrands can enter attics or crawl spaces through vents. All vents should be screened with metal screening with openings of 1/8 inch or less. Soffit vents should be located as close to the edge of the eave as possible. Vegetation around foundation vents can create unintended vulnerability, particularly on the downhill side of the home. Landscaping with noncombustible mulch within three to five feet of the foundation and underneath decks or porches is essential.

In addition to the roof, decks are extremely vulnerable to fire. The deck surface is exposed to fire brands and fire brands can collect underneath decks. Possibly the worst mistake any homeowner can make is to store any combustible material beneath a deck. Countless homes have been lost because of firewood, scrap lumber, even gasoline stored under a deck. Even motorized equipment, when left under a deck, with gas in the tank has caused home losses during fires.

Ideally the underside of decks should be enclosed with a non-combustible material. If that is not possible, covering the area under a deck with stone, concrete or rock mulch will make the deck safer.

When decks are rebuilt use fire resistant materials. Cement Fiberboard is a popular flooring material for decks due to its resistance to ignition. Fire resistant fiberboard should have a Class B rating, but not all cement fiberboard is class B. Be certain the decking has a class B fire rating before purchasing it.

Carefully consider the landscaping in the vicinity of decks as well. Avoid planting flammable shrubs, such as junipers, anywhere near decks. Potted plants or planters on decks may also increase the hazard. Even furniture with cushions or wooden frames may ignite from firebrands. The area of defensible space should be increased near decks, especially on the downhill side.

Fire resistance of windows and doors should be considered. If window glass breaks, firebrands will enter the house. The most fire resistant glass is low emissivity, tempered glass which withstands the heat of a fire for the longest period. Double pane windows last longer than single pane windows when exposed to the heat of a fire.

Window frames are also important. Metal frames offer the best protection. Vinyl frames usually do not burn but can melt when exposed to heat. Wooden frames will burn. Metal screening on the outside of windows offers additional protection, but most windows are sold with nylon screening that will melt. Solid metal shutters offer the best protection, assuming the homeowner has the opportunity to close them before evacuating.

Wooden doors are obviously able to burn during a fire. The thicker the door the more resistant it will be. Metal doors are far superior, and glass in doors is subject to the same vulnerabilities as window glass. Well maintained weather stripping in outside doors will help prevent fire brands from entering a home.

VI. Emergency Egress

The Monument Fire District has many areas where ingress and egress will be difficult under emergency conditions. Narrow roadways, blind curves, steep grades and heavy fuels will place evacuating residents and incoming emergency personnel at risk. It is recommended MFD prioritize transportation routes within the District for fuel treatments.

Figure 26. Smoke, here from a low intensity prescribed burn, can significantly reduce visibility along roads. In high intensity wildfires visibility can be reduced to zero.

Multiple ingress and egress points are critical to public safety. Egress is needed for residents to evacuate and ingress is required for emergency services. That multiple egress and evacuation points ensure 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 most communities[5] At present, many older housing enclaves have only one actual egress point as do some newer areas along spur roads off of steep ridgelines. It is also important to note that "bottlenecks" may occur within these communities if all traffic is directed to only one entrance.

A quote by Jack Cohen, Fire Scientist with the USDA Forest Service noted that, "Long evacuation routes are NO evacuation routes."[6]

If a fire is threatening an area, it is sensible to evacuate before the sheriff issues an evacuation order. Escape on narrow unmitigated roads during the congestion and panic of an evacuation is dangerous. Conversely, if no evacuation order is issued, returning home is a simple matter.

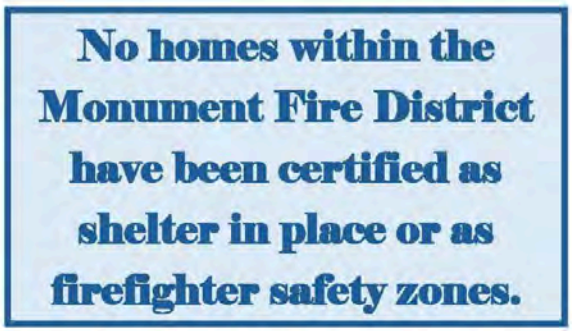
5 Cova, Thomas J. (2005). Public Safety in the Urban-Wildland Interface: Should Fire-[rone Communities Have a Maximum Occupancy? Natural Hazards Review, August 2005.

6 Cohen, Jack (2006). Personal communication at the National Wildland/Urban Interface Fire Education Conference. November 4, 2006.

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 waited too long to evacuate. It is recognized that if smoke and flames are already present, it may already be too late to evacuate. Evacuations are panic situations. It can be expected that residents fleeing the community will clog existing roadways and impede access by emergency service providers.

Creating secondary access out of most communities may not be possible or practical. Therefore, it is critical that all roadways be heavily treated to reduce fuel volumes along major ingress/egress routes.

Shelter In Place (SIP)



All residents should make plans to evacuate immediately when advised by emergency services personnel to do so. However, in the event homeowners are trapped and unable to escape, the home may be the next safest place to stay.

Limited access and sub-standard egress routes in heavy fuel areas may force homeowners to consider shelter-in-place ("SIP") as their only alternative during a major wildfire event. Many fatalities occur during the process of evacuation; especially when homeowners wait too long to evacuate. At this writing no homes in the Monument Fire District have been certified as shelter in place standards. Even if SIP conditions are met, evacuation orders from fire authorities should be followed. The decision to shelter in place should be made by the fire management team and not individual homeowners, and all orders from authorities should be followed.

NOTE: Achievement of SIP should be considered just one part of the long range goal toward "Wildfire Adaption" and "Fire Adapted Communities" (FAC). It is included in this plan to help property owners understand the levels of mitigation necessary to coexist with fire as a natural phenomenon.

It is important to understand that all the requirements for shelter in place must be met well in advance of a wildfire. It is not possible or safe to attempt to create stand-alone conditions during a wildfire. To do so is unwise and compromises the safety of homeowners and firefighters. Furthermore, creation of stand-alone conditions requires a great deal of advance planning and coordination between the landowners, fire professionals and natural resource advisors.

The recommendation to shelter-in-place should only be followed by individuals who have taken precautionary measures prior to a wildfire event. The following 17 criteria are recommended to be met in their entirety prior to considering sheltering in place.

1. Has the structure been determined in advance to be "Stand Alone" by the local fire district? Structural hardening against ember intrusions is necessary.
2. Is the fire management team aware that shelter in place conditions have been met, and are they aware that residents are being sheltered?
3. Are building materials fire resistant enough to prevent combustion from a flame front or firebrand storm?
4. Is the property defensible with minimal resources?
5. Can the property (ecosystem) actually benefit from fire, or suffer little harm?
6. Can fire be used by professionals in the defense of the property?
7. Are the adjacent properties treated as well?
8. Is the community treated to reduce fire intensity and manage wildfire behavior?

9. Have the surrounding areas, including public lands, been treated to reduce fire intensity? Are watersheds feeding the community treated?
10. Are there adequate safety zones meeting NWCG criteria on the property?
11. Can safety zones within the community be accessed safely during a major fire event?
12. Are driveways and roadways safe for travel during a major event?
13. Are there multiple routes to the safety zone?
14. Has the property owner received wildland fire operations safety training, and understands fire behavior? Does the owner have appropriate safety equipment and apparel?
15. Are backup fire prevention/suppression measures in place? In the event of power loss or public water system failure? Examples: Foams, generators, gels, fire retardant systems.
16. Is the person healthy and both physically and mentally fit?
17. Are sufficient supplies (food, water, medical supplies) on hand for at least a 72-hour period?

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

Shelter-in-place Structures as Fire Fighter Safety Zones

Conceptually, if sufficient numbers of homeowners within neighborhoods create easily defensible structures, defensible spaces and home ignition zones (HIZ), then firefighting resources can potentially remain in place longer and with a higher degree of safety. Fire adapted homes and properties can allow for fire frontal passage and deployment back into neighborhoods to check on structures and perform “mop-up” operations. Ideally, all homes are safety zones and fire fighters can focus on protecting natural resources.

It should be noted that no homes within the Monument Fire District have been identified as either SIP or Safety Zones. All wildfires require firefighter “situational awareness” and should include use of structures as temporary shelters. It should be a long-term goal, in cooperation with property owners, to eventually identify future SIP structures.

VII. SERVICES, INFRASTRUCTURES, WILDLAND FIRE REPONSES

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

Professional Wildland Fire Response Services

For wildland fire emergencies endangering residents, the first line of responders are MFD firefighters. If MFD finds that the fire is beyond their capability to suppress, the Incident Commander on-scene will request additional assistance. Assistance will be available through Automatic Response and Mutual Aid agreements from both within and outside El Paso County. Monument Fire District will coordinate and administer these services.

El Paso County Sheriff's Office (EPSO)

Subject to the provisions of any relevant plans or agreements, the sheriff of every county, in addition to other duties, shall act as fire warden of the sheriff's respective county and is responsible for the coordination of fire suppression efforts in case of prairie, forest or wildland fires or wildfires occurring in the unincorporated area of the county outside the boundaries of a fire department or that exceed the capabilities of the fire department to control or extinguish" CO rev stat § 30-10-512 (2024).

The El Paso County Sheriff's Office (EPSO) is the law enforcement agency for El Paso County and may work with the other municipal law enforcement agencies as needed to facilitate emergency evacuations. EPSO also has the EPSO-Wildland Fire Unit that focuses on wildland fire mitigation efforts across the county, and wildland fire suppression should wildland fires occur in unincorporated El Paso County, or should fire districts request additional aid within the county.[EF1]

The Sheriff, by state statute, is the "Fire Warden" for unincorporated areas of El Paso County. Emergency evacuations are handled by EPSO and may involve coordination with other law enforcement agencies in adjoining areas.

Other Emergency Resources

Pikes Peak Regional Office of Emergency Management (PPROEM):

The Pikes Peak Regional Office of Emergency Management is a comprehensive emergency management program that focuses on building resilience for the whole community through disaster coordination, preparedness, planning, and recovery activities. PPROEM activates and operates the Emergency Coordination Center during all-hazard events to support the community, resource management, operational coordination, and information sharing. The ECC Operational Plan and the PPROEM Emergency Operations Plan describes how the ECC is activated, operated, and demobilized along with partner roles and responsibilities.

Peak Alerts: El Paso-Teller 911 Authority:

The El Paso-Teller 911 Authority is the regional organization responsible for providing and maintaining the Peak Alerts emergency notification system. Incident commanders provide the area of notification to their primary dispatch agency, which then sends out the appropriate message to impacted areas. The messages may be:

- Pre-Evacuation Warning - Be Prepared to Leave
- Evacuation Order - Ordered to Evacuate Now
- Shelter-in-place - Shelter in a safe place away from doors and windows.

The Authority has contracted with Resident Connections to provide a robust database that contains landline, VoIP and mobile numbers associated with addresses in El Paso and Teller Counties. See page 12 for the El Paso-Teller 911 Authority website address.

Mutual Aid and Automatic Aid

In the event of a large-scale wildland fire, MFD maintains mutual aid agreements with neighboring fire and emergency services agencies to provide equipment and personnel assistance for incidents that exceed the capability of the local resources to manage. The agreement(s) encompasses fire departments from El Paso, Douglas and Teller Counties, City of Colorado Springs and the Air Force Academy Fire Department. As resources begin to deplete and the situation is recognized to be one that could be disastrous, municipal and county officials will become involved.

Monument Fire District

Monument Fire Protection District (Monument) is the first responder to a sighted or reported wildland fire threatening the the environs surrounding and interior to the District. Monument has five stations: A photo of the district's fleet is shown in Figure 27.

In the event Monument FPD personnel and equipment resources become exhausted, first reinforcement mutual aid calls are Colorado Springs Fire Department, Air Force Academy Fire Department and El Paso County Sheriff's Office County Wildland Team. Automatic Aid and Mutual Aid Agreements are on file with MFD.

Figure 27. MFD Fleet

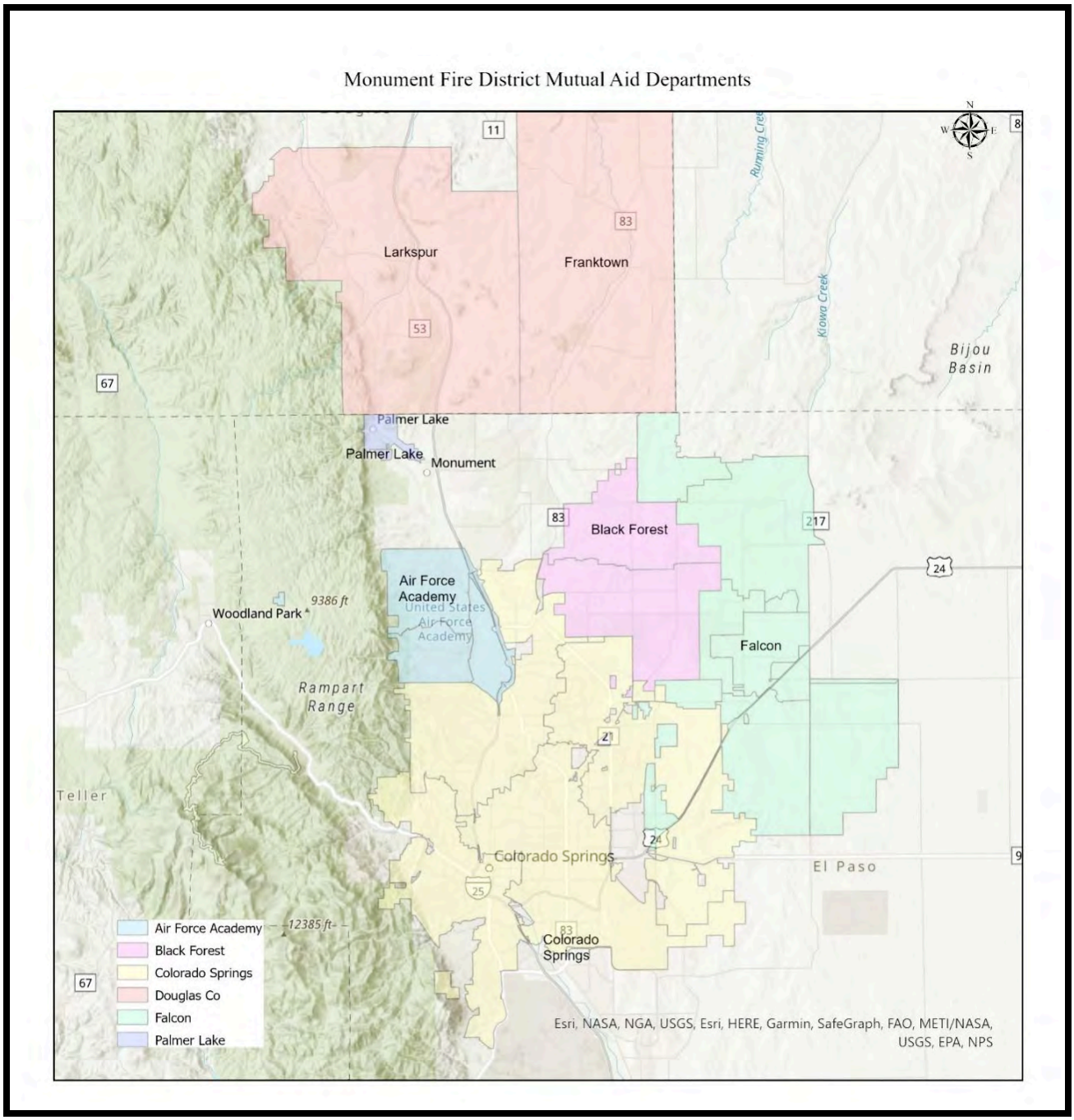


Figure 28. Mutual Aid Fire Departments

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

Emergency Medical Services

MFD provides advanced life support emergency medical services to the District. All MFD operations personnel hold a minimum of certification of Emergency Medical Technician (EMT) with select employees certified to the Paramedic level..

MFD Community Risk Assessment (CRA)

The fire district has completed an updated (2025) Community Risk Assessment (CRA) covering all known risks to life, property and natural resources of the district. This comprehensive document outlines MFD's response to wildfires in and outside of the district. Due to its length, it is not included here but is kept on file at the district headquarters. The map of MFD water systems, in Figure 29 , is from the 2025 CRA.

Water Resources

MFD has a combination of hydranted and un-hydranted areas. Hydrant systems are typically operated and maintained by a water district or combination water/sewer districts. These are shown in Figure 29. Facilities consisting of water storage tanks, wells, pumping stations and water treatment plants, were assessed during the CWPP study period. All are considered "critical infrastructure". Sewer system components were also assessed. In general, the following conditions were observed:

- Buildings need to be hardened against ember exposures.
- All combustible components that may be damaged by high heat should be protected. Examples are telemetry, electrical and communication lines that can melt.
- Vegetation clearances should be increased along with weed management both in and around facilities.
- Electrical transformers and utility pedestals should also be protected as an extension of the facility's critical infrastructure.
- In areas without redundant backup systems in place, backup power supplies should be installed. Examples are sewer lift stations affected by a wildfire related power outages, that may impact the habitability of the served community.

In the un-hydranted areas of the district, MFD has water tenders available for structural protection and wildfire protection. Mutual aid departments can also provide backup water. Cisterns may also be available if not located in the path of approaching wildfires. Example: The Cathedral Pines cistern system was not safely accessible by firefighters during the 2013 Black Forest Fire due to surrounding heavy fuels and extreme fire behavior.

NOTE: Water supplies and delivery systems are traditionally set up to handle one structure on fire at one time. During a wildfire, hundreds of homes may be affected at the same time. Add to this the mobility required by firefighters during wildland events to stay out of harm's way, and suppress fire starts across wide areas. Water delivery cannot be assured due to demands on the system resulting in: 1.) No water is available; or 2) Insufficient water pressure is available.

Large bodies of water are present in the district. Monument Lake, Lake Woodmoor, and Forest Lakes contain significant volumes of water potentially available for wildfire suppression. Both are of sufficient size to allow use by firefighting helicopters, or as water drafting sites. However, use is not guaranteed. MFD should consider:

- Obtain written permission from the owner of the lake and water rights for emergency use.

- Establish authority of MFD for emergency use of water.[7]
- Consider installation of “dry-hydrant” standpipes for water drafting capability with the necessary vehicle access points.
- Seasonal variations in water depth and accessibility.

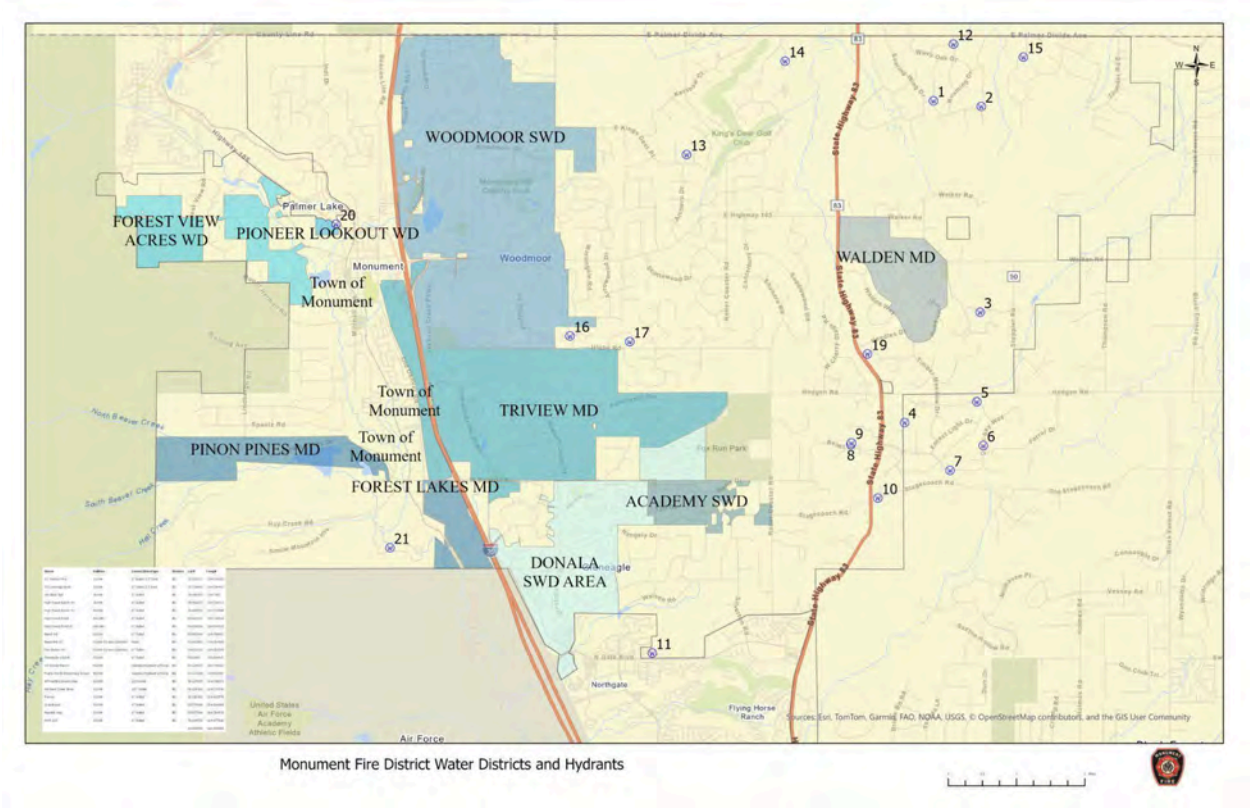


Figure 29. Water Systems available to MFD (Source: MFD CRA-2025)

Refuge Zones/Staging Areas

During emergency situations, it may be necessary for residents and emergency services providers to reach a safe place that is outside of the community. MFD, in conjunction with other wildfire authorities, recommends establishment of Refuge Zones outside the communities. These can be used as reasonably safe areas where little or no wildfire risk exists in close proximity to either natural (vegetation) or man-made (homes) fuels. These may serve two purposes. The first is as a refuge from any wildfire threat. The second is as staging areas to allow timely and orderly evacuation of residents. It should be noted that many of the civilian fatalities from wildfires are caused during evacuations in which residents become trapped and overrun by fire. Once residents are evacuated, these safety zones may be used by firefighters as staging areas for marshalling resources within the community. MFD should work toward formal designation of these areas over the next 5-10 years in cooperation with all emergency service providers.

All residents should learn at least two exits from their communities.

[7] Actual case, 2002 Hayman Fire. Pueblo Interagency Fire Dispatch was denied helicopter access by the owner of a lake in Perry Park, Co. .

Public Information and Communications

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

Residents often struggle to receive accurate and timely information during wildfire events. Local media cannot always be relied on to provide updates for specific locations within a wildfire incident area. 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. Residents are encouraged to register for Peak Alerts to receive information directly from local dispatch centers.

At the request of the Monument Fire District, the El Paso County Sheriff's Office Public Information Officer (PIO) may provide public information support to the emergency, and/or the Joint Information Center (JIC) may be activated through the Pikes Peak Regional Office of Emergency Management (PPROEM) for further public information and communication support.

Critical Utilities

In the event of a wildland fire that would impact the Fire District, Monument or the Incident Commander Would notify critical utilities for their support. Specifically, emergency involvement of utility support would focus on two areas: 1) Safety of the public and emergency response personnel and 2) Direct support of mitigating the emergency event.

Public and Emergency Response Personnel Safety

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

Natural Gas Services:	*Blackhills Energy* Colorado Springs Utilities
Electrical Power Services:	*Mountain View Electric Association* *CORE Electric Cooperative*

Direct Support

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

Water:	*Water Districts:* *Town of Monument*

Woodmoor Water and Sanitation
Tri-View Metropolitan District
Forest Lakes Metropolitan District
Forest View Acres Water District
Donala Water District
Walden Water (Corp.)
Academy Water District

Wire-line Communications: *Century Link Communications*:
Comcast
Force Broadband

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 in the watersheds to the west of, or in the Fire District, the Pikes Peak Regional Office of Emergency Management will need to immediately coordinate with SME's state, local and Federal partners to assess the hazards and to reclaim or stabilize areas above homes. Burned areas will be prone to mudslides, debris flows and/or rock fall hazards. These can have an impact on surviving residences and the District 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. El Paso County 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. This should be coordinated through El Paso County DOT.
3. Consider the most effective stabilization of areas above homes and critical infrastructure with a combination of temporary and permanent erosion control measures. This should be coordinated through EP Environmental Services, Natural Resource Conservation Service (NRCS) and local soil conservation district.

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

Insect and Disease Prevention and Control

The Palmer Divide contains stands of ponderosa pines that will be susceptible to Mountain Pine Beetle (MPB) infestation. Mountain Pine Beetle is active in the area, although the activity seems to be confined to individual trees or small pockets of trees at this writing. The threat of increased activity is always present, and vigilance will be necessary on the part of District residents to regularly inspect trees on private lots and greenbelt areas for any signs of infestation.

Large groups of dead trees can contribute to fuel loading in the community and should be removed and treated in a timely manner each year to prevent spread. No general, area-wide preventive spraying program is recommended at this time for prevention of MPB. Should an outbreak occur in the area, homeowners should be advised to consider preventively spraying non-infested mature pines using a Colorado Department of Agriculture (CDA) licensed applicator. Note: No pesticide applications are approved or endorsed as part of this plan. It is in violation of federal law to apply any pesticide inconsistent with label directions. Preventative spraying is not recommended as a precautionary strategy when MPB activity is endemic (low). The preventative kills insects that prey on aphids. Unneeded preventative spraying may result in severe aphid damage to the tree.

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

Builders who remove trees for lot clearing and subsequent home construction should chip or remove all lot clearing slash within six weeks of cutting to prevent use of fresh slash by Ips Engraver Beetles (Ips) as brood wood. Ips generally attack trees weakened by lightning strikes, root damage during construction or transplanting. Ips activity is currently heavy just south of the District in Fremont County and the insects appear to be moving north. High value, stressed trees may be preventively sprayed until the stressing agent is eliminated. The most effective prevention for harmful insects is always a good program of forest management and thinning. Properly thinned trees will be less susceptible to insects, and thinned stands are more likely to survive a wildfire without serious damage. More information about insect and disease prevention and treatment is included in Appendix E.

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

Weed Control

Virtually all areas of the District are infested with noxious weeds that are displacing native plants and degrading wildlife habitat. Noxious weeds can also contribute to wildfire spread. District residents should begin an annual control program of mowing and spraying. CDA licensed applicators are recommended. If spraying is not possible, biological control agents (typically host specific insects), should be introduced to lower the rate of spread. Information on noxious weeds and their control is available through the El Paso County Cooperative Extension Service. Their web site is:

https://elpaso.extension.colostate.edu/

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

VIII. PUBLIC NOTIFICATION, COMMUNICATION AND SUPPORT

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

Warnings and Hazard Notification to the General Public

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

Services Communications and Support Systems

Non-threatening Conditions
Informational notifications are done for public meetings, events and general services conduct or schedule information. Several mediums are used for general public informational notifications including Fire District Board of Director notices of meetings, general letter mailing, flyer posting and mailings.

Wildfire Condition

In the event of an actual wildfire impacting the community, updated residential wildfire event information may be posted periodically on https://pproem.com/ . Periodic updates regarding emergency events are also generally broadcasted via AM radio, on the official emergency public broadcasted radio station for El Paso County.

Peak Alerts notifications are not automatically routed to cellular phones. To be certain of notifications, residents who rely on cellular phones should register their phones at:

peakalerts.org

IX IMPLEMENTATION PLAN

Chapter 9 provides a summary of actions needed to implement the MFD Community Wildfire Protection Plan. These actions address four broad subject areas to enhance residents' safety and diminish wildfire potential in and adjacent to the District as identified in Chapter 4, Wildfire Hazard Assessment. The public education actions will teach residents to reduce the ignition potential of their homes and community. In the event of a wildfire crisis, residents will have advanced knowledge to protect their family's safety.

The actions set forth in the Fuels Treatment category, short and long term, are based on current forestry and fire science. Fuels Treatment actions address wildland fuel mitigation in the MFD and adjacent private and Forest Service owned lands. The general time frames identified for developing fuel treatments in these high wildfire risk areas is based upon risk potential and funding availability. The priorities associated with these areas can be found in Chapter 4, *Wildfire Hazard Assessment*, and Appendix A, *Hazard Reduction Mitigation Projects*.

The third area addressed in the implementation plan is communication, support and information services. The information will be useful to motivate mitigation by private landowners and for firefighting efforts when a fire occurs.

The final broad focus area is project maintenance and addresses preserving the effectiveness of fuel mitigated areas as well as ongoing CWPP administration.

Public Education

The MFD 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*," the community may experience up to 10% change to its profile of residents during the year. Many of these "*new*" residents of the community may not be initially familiar with living in a high wildfire risk area. The Public Education actions of this Community Wildfire Prevention Plan are planned to educate these newcomers as well as increase the knowledge of the current residential base in areas of family safety, Firewise strategies and construction, fuels mitigation actions, and landscaping materials that are more resistant to ignition than wood or other commonly used building and landscaping products.

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

- Public Education programs will use professionally developed instruction material from resources recognized for their experience and expertise including,
    - National Firewise USA
    - American Planning Association
    - United States Forest Service
    - Colorado State Forest Service
    - Colorado State University Cooperative Extension
    - Monument Fire District
    - El Paso County
    - Private Consultants

- Upon publication of the **2025** Community Wildfire Protection Plan for Monument Fire District, the District staff should develop an annual schedule that is published and available for public review. Also, see **Appendix E**, *Firewise Household Tips, Property Mitigation and Protection.*

- Coordinate firefighter training with other agencies. Work with surrounding fire departments, the USFS, Air Force Academy and El Paso County to provide fire experience for slash pile burning and prescribed fire.

- Involve the public in as many phases of planning as possible for all burning operations to teach that smoke in the air can be a good sign of fuel hazards being reduced. Also teach the economy of scale for fuel treatment costs utilizing fire as a management tool for both fuel reduction and ecosystem restoration. Good communication with Monument on all agency or NGO burns should be done well in advance.

- Utilize any social media sites to relay information. Twitter, Facebook, Nextdoor and other communication apps/tools should be used if appropriate.

Although several public meetings have been held to inform and/or assess public opinion of *Firewise* and wildfire issues, the 2025 baseline for this implementation plan area is considered zero. Annual assessment of public training will be based upon the public education training and informative session attendance as well as comments and reactions from the general public. For overall impact against the wildfire protection plan program, training session attendance should be totaled annually and expressed as a percentage of total residents. This percentage should be trended year after year for evaluation and public education course management purposes.

Fuels Treatment

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

<u>Road Rights of Way and Refuge/Staging Zones</u>

Fuel Treatments along roadways provide quick, safe access for wildfire defensive positions and wildfire suppression; as such, they are necessarily linked with road systems. Where possible, potential fuelbreaks proposed in this Plan have been connected with public and private roads and time-established

trails within less developed areas. These potential fuel treatments will provide good access and defensive positions for firefighting equipment and support vehicles. In addition to creating defensive gaps of potential wildfire fuel and affording good access, potential fuel treatments are proposed in this plan to create "*compartments*" as described in Chapter 5 that break up large tracts of dense fuel, thus limiting uncontrolled spread of wildfire. The planned fuel treatments and the "*compartments*" they enclose can be seen on the Compartment Map, Chapter 4, *Hazard Assessment.*

Adequately designed Refuge/Staging Zones can aid both residents and firefighters. These will need to be monitored throughout the growing season for potential wildfire risks. Once constructed, the primary need will be mowing and pruning of ladder fuels. Caution should be taken on large scale forest openings and their impact of soil erosion; especially on steep slopes.

Implementation Actions

Mitigate existing and proposed road areas within the right of way associated with the road. Generally, in all established and planned roads within the Monument Fire District, this action creates a fuel gap of 60-120 feet; i.e., 30-60 feet either side of the centerline of the road. Although Colorado State Forest Service 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 the right of way can be mitigated quickly. within the road right of way, followed later by working with adjacent landowners to encourage widening the fuel treatments into fuelbreaks by encouraging "*feathering*" of the fuel treatments into their private land. The Monument Board will:

- Work with Colorado Department of Transportation (CDOT), El Paso County Department of Transportation (EPDOT), CSFS and El Paso County Environmental Services to assess and cooperate on joint fuel mitigation projects;
- Review prioritization of fuel mitigation projects and schedule projects annually based upon funding and the identified risk priority of the projects;
- Take action to establish a separate budgeting category (2025 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 Monument Fire District Board jurisdiction;
- Detail and file for particular State and 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 Monument FPD website (if developed) for public access.

State and Federal Properties

Publicly managed areas away from main roadways and refuge/staging zones can either help or hinder individual homeowner actions. State And federal 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 lot size, terrain, differing or absentee ownerships, etc. On-going maintenance by outside contractors or in-house staff will be important to provide risk reduction for adjacent home sites.

Implementation Actions

The Monument Fire District staff will need to work closely with government agencies adjacent to landowners to ensure that treatment projects allow for some level of privacy protection currently provided by the overgrown and declining Gambel oak and conifer plant community. Visual sensitivity will be important. The District staff should:

- Work with wildfire professionals to lay out treatment areas on state and federal properties by advising the neighborhood of all activities. Coordination with adjacent property owners will be necessary.
- The same items noted under Fuel treatments and Refuge/Staging Zones will apply.
- Work with wildlife professionals to aid in fuel treatments that will be effective while minimizing effects on potential threatened or endangered (T&E) species. Or the reverse: that T&E species regulations will not prohibit or deter homeowners fire mitigation efforts.

Private Homeowner and Landowner Properties

Wildfire fuel mitigation on private properties is the responsibility of the property owner. Monument Fire District has no authority to compel projects on private land. District staff will provide information and services to encourage and assist property owners in their mitigation efforts. Land owners, adjacent to open space properties, will be encouraged to work with the adjacent land managers in extending mitigated fuel treatments into their private property. Cross boundary mitigation is a fundamental belief that underlays all objectives in this plan. Cross boundary projects benefit all participants with economies of scale, and larger areas of forest restoration.

Implementation Actions

- Monument Fire District will work with private property owners within the boundaries of the District to support them in mitigation efforts by:
  - Providing resource and education help as indicated in the "*Public Education*" actions, above;
  - Continue to track "*in kind*" private fuel mitigation work on private property;
  - Fund certain support projects; e.g., periodic *slash* removal;
  - Develop alternative methods to fund the slash and yard waste disposal sites; The Black Forest Slash and Mulch Site is open to District residents, but inconveniently far for most. As a high priority under this CWPP, The District should seek grant funding to purchase a mobile air curtain burner to help landowners dispose of slash.
  - Formalize Design Review processes and Design Guideline modifications that allow for implementation of Defensible Spaces. These shall utilize the services of Monument FD firefighters and professional foresters. Note: The recent passage of Colorado State Statutes that must allow for homeowner defensible spaces shall be incorporated into any new guidelines.
  - Continue to encourage replacement of wood shake-shingle roofs by allowing as many materials as possible. Note: There is no prohibition on use of fiberglass composition

roofing. Alternatives that maintain the aesthetic values currently established, while providing a "Class A" level of protection are critical.

- Provide information distribution of wildfire planning or Firewise events or activities affecting the homeowner;
- Recognize and adopt SB-100 wildfire mitigation language as part of the architectural control (ACC) process (see Appendix B, SB-100) so that no homeowner is prohibited from implementing mitigation efforts.
- Notify owners/operators of telecommunication facilities in the District that fire protection efforts will be limited or impossible without pre-treatment/mitigation.
- Assist owners with any Endangered Species regulations that may impede implementation of Firewise actions on private land. Actions that involve Federal funds may require cooperation with US Fish and Wildlife Service (USFWS). USFWS guidelines are attached as Appendix J. Colorado State Forest Service Defensible Space thinning criteria are attached as Appendix K.

Undeveloped, NGO Properties

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

Implementation Actions

- Monument Fire District will work with private property owners of undeveloped lands bordering residential properties to assess and plan potential joint mitigation efforts. Concurrently, MFD should pursue collaboration with El Paso County agencies and officials to assist and support efforts to reduce wildfire exposure by addressing undeveloped areas. Such actions will include efforts to:
  - Assess timing of in-fill development in undeveloped areas and working with them, in conjunction with El Paso County, to effect guideline driven fuel mitigation on their targeted properties prior to structure construction;
  - Encourage and stimulate El Paso County authorities to effect changes in ordinances and statutes to require developers to mitigate the areas being developed prior to any construction;
  - Initiate further discussion with owners of large parcels, the United States Forest Service (with the Pike National Forest to the west), and the Air Force Academy to assess potential individual and joint wildfire mitigation efforts on common interest areas.

Communication, Support and Information Services

Communication, support and information services, with emergency services agencies and the public, is instrumental to nurture wildfire prevention and protection in the event of a wildfire emergency (See Chapter 7, *Public Notification, Communication and Support*). Actions designated below will raise 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 Monument.

Implementation Actions

- ➢ Implementation actions, in addition to Peak Alerts, are recommended to:
  - Notify the public of wildfire preventive actions being taken by using the Monument FD newsletter, distributed flyers, direct mailing, or combinations of the aforementioned media.
  - Recognize implemented projects in the newsletter;
  - Identify, schedule and fund wildfire protection ancillary projects; e.g., Remote Automated Weather System (RAWS), improved communications, signage, etc.
  - NOTE: Peak Alerts has the capability of identifying the percentage of residents signed up for alerts. Coordinate sign-ups with the assistance of the El Paso/Teller 911 Authority to measure participation before and after outreach projects.

Mitigated Areas Maintenance

The focus of this broad section of the Implementation Plan is twofold: 1) to establish maintenance guidelines for completed fuel reduction, and 2) to set forth a checklist of administrative actions that need to be followed by the MFD.

Implementation Actions

- ➢ Existing wildfire fuel treatments must be maintained to remain effective. In order to evaluate effectively when maintenance of mitigated areas is needed, the horizontal and vertical separation of fuels should be assessed. A rule of thumb is to maintain a vertical separation of three times the height of the understory vegetation. This guideline is applicable to both private and public property. To maintain mitigated areas, private property owners and the Monument Fire District Staff 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 vertical vegetation growth becomes a ladder fuel.

 Recommendations to MFD staff for implementation of administrative actions:

- Establish a separate Monument 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 privately owned property, Monument support functions and Monument 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 Monument funds for "*direct*" funded wildfire fuel mitigation on road/trail rights of way and any Monument owned property;
- Contact and begin discussion with private property owners for potential individual and joint wildfire mitigation efforts on common interest areas and conduct training on defensible space and home construction safety;
- Fund wildfire prevention training for all Monument Fire District residents;
- Assess timing of and maintain a schedule of land development action in currently undeveloped areas;
- Support communities to effect a second road for egress/ingress to all developed areas within the District;
- 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.

Post-fire Preparedness

Post-fire flooding can occur when large areas of forests are severely damaged or destroyed. Heat baked soils can become hydrophobic causing loss of soil stability that often results in severe runoff containing silt, ash and debris. All the agencies listed previously will need to work together to protect the habitability of the community. Examples are:

- Major arterial roadways and local streets where these cross natural and manmade storm water channels will be at greatest risk.
- Infrastructure and utility lines contained within these drainageways will be at risk.
- Neighborhood impacts to culverts and side streets will be an ongoing maintenance issue from mud flows.
- Mud and debris flows from severely burned hillsides above homes can result in home losses. **NOTE: Losses by flooding are not typically covered by homeowner insurance.** Homeowners may need to acquire insurance through federal flood insurance programs.
- Home protection measures may be required to divert storm flows around homes such as sandbags, concrete diversions, and construction of embankments.
- Severe storm alerts should be monitored for many years after damage occurs. Even today, twenty years after the 2002 Hayman Fire, storm warnings alert the public to potential flooding in the burn area.

Insect and Disease Control

Forest insects and diseases (I&D) can contribute to wildfire potential by creating large bodies of dead and/or dying fuels. Drought periods will contribute to I&D losses. The following are several key pests:

Dwarf Mistletoes

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

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

Mountain Pine Beetle

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

1. Train all homeowners in MPB detection and control.
2. Establish an annual inspection program of all pine stands and locate infested trees by late fall.
3. Develop a plan for infested tree removal and treatment.
4. When there are infested trees nearby, recommend preventive spraying of high value pines on residential properties. All infested trees should be treated or removed by May 1 of each year.
5. Thin all pine stands to CSFS recommended levels for improved tree health and vigor.

Ips Engraver Beetles

Ips, or engraver, beetles frequently invade slash from mitigation projects if it is not properly treated within six weeks of cutting. Then ips may invade smaller green teas creating patches of dead fuels. Any slash should be treated by chiping, properly lopping and scattering or transport to the Black Forest Slash and Mulch site within four weeks or cutting. Landowners should be trained to look for signs of ips infestation–reddish boring dust– on slash and on green trees.

Other Forest Pests

Several other forest insects are present. If outbreaks occur in the future, high value trees should be treated to prevent losses that will contribute to additional fuel loading. Budworm defoliated trees will become more susceptible to attack by bark beetles. Budworm outbreaks are often controlled by climatic factors that allow for either epidemic or endemic conditions. The following actions may be necessary:

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

The insect pest currently being monitored in western El Paso and Douglas Counties is Douglas-fir tussock moth. This pest can rapidly defoliate and kill Douglas-firs. Typically, infestations are at low levels and inconspicuous. However, climatic factors can allow for occasional outbreaks. No action is required at this time. MFD should stay in contact with CSFS foresters to monitor for outbreaks in the area.

X. RESIDENT RESPONSIBILITIES

Multiple large fires have occurred in this area, resulting in the loss of homes. Additional fires are certain to occur in the future. Residents and property owners should be put on notice that:

- Wildfire mitigation is the responsibility of the property owner who is the sole owner of his/her fuels. An Australian saying bluntly states, "You own the fuel, you own the fire." A model for homeowner responsibility is shown below.

- Secondary responsibility falls on neighbors who must work together to manage their collective wildfire risks. Property owners who do not mitigate their fuels place their neighbor's lives, homes and forests at risk.

- Thinning trees to provide good spacing between individual or groups of trees, and pruning dead and lower branches, reduces wildfire risk as well as improves forest health, vigor, growth, and aesthetic value.

- Structural hardening against ember ignitions and flames must be done on all structures constructed in wildfire prone environments. This will be critical to maintain access to affordable homeowner insurance.

- Property owners must recognize their responsibility to firefighters by providing a safe working space. Firefighters will attempt to protect all homes, if given a chance. Owners should also be aware that failure to mitigate their structures and native fuels may negate the time and expense invested by landowners who mitigated their fuels.

- Structure protection by firefighters during an incident is not guaranteed.

- Property owners must learn that traditional firefighting resources are based on one house on fire at one time. Wildfires, especially with extreme burning conditions, place hundreds of homes at risk at one time. Property tax assessments that fund the fire department are predicated on the traditional model not the wildfire model.

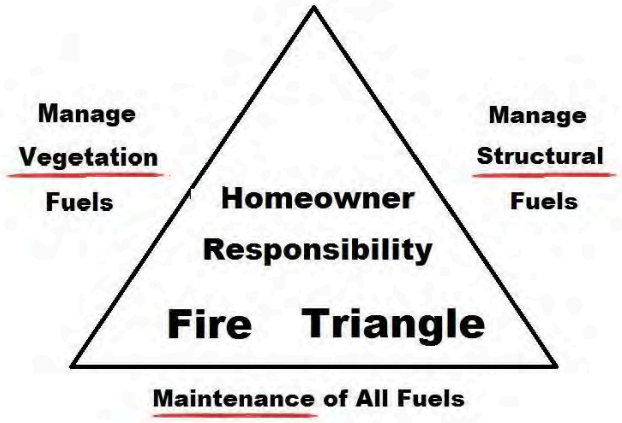


Figure 30. A Fire Triangle[8] in which property owners take personal responsibility for their private property

[8] Based on wildland firefighter "Fire Triangles". Fire Triangle is fuel, heat and oxygen. Fire Behavior Triangle is fuel, weather and topography. The common element is fuel- the only shared and controllable element.

Firefighters are trained to understand two important “triangles”. The first is the Fire Triangle representing the three requirements for combustion: Fuel, Heat and Oxygen. The second is the Fire Behavior Triangle representing Fuel, Weather and Topography. Homeowners should adopt the triangle shown on the previous page (Figure 30) since they are responsible for their vegetative fuels, structural fuels, and maintenance of both.

Critical Lessons Learned

No amount of fire engines, firefighters, bulldozers, slurry bombers or helicopters could have stopped the Waldo Canyon or Black Forest Fires. Unmitigated forest fuels combined with up sloping terrain and high winds immediately overwhelmed any attempts at containment. Unfortunately, four residents lost their lives in the ensuing firestorms.

Critical lessons learned were:

- Defensible spaces are critical for ensuring firefighter safety and effectiveness.
- Defensible spaces and Home Ignition Zones can be overwhelmed by wildfire from unmitigated adjoining properties.
- Where forest fuels have been treated, tree losses and resource damage are significantly reduced.
- Fire is an ecological process. Fire adapted communities are more resilient and result in reduced risks.
- Structural hardening to prevent ember ignitions is just as important (if not more important) as treatment of surrounding native fuels.
- Unregulated construction in areas prone to extreme wildfire behavior will continue to result in similar disasters.

XI. SUMMARY

This plan is intended as a guide to help reduce losses from catastrophic wildfire. The CWPP is a living document that allows for flexibility and adaptive management. Adjustments, based on new science and technologies, can be adopted without need for plan modification, so long as the intent of the CWPP is met.

MFD is a special area and provides a unique living environment with its mix of forests and prairies. Wildfires are inevitable and a part of the Ponderosa Pine, mixed-conifer, pinon-juniper and prairie ecosystems. It is not a matter of “if”, but “when” wildfires will occur. It takes a community that is resolved to work together to manage this risk. Responsibility begins with every property owner, supported by community wide mitigation efforts.

Appendix A:
Projects and Priorities

The following pages contain projects the Monument Fire Protection District (MFPD), its partners and all private owners should undertake to manage wildfire risks to MFPD. These should all be considered high priority projects to complete within the next five years. Any fuels mitigation on ownerships within a ½ mile wide area should be included as a priority. Partners may include:

Town of Monument
Town of Palmer Lake
City of Colorado Springs
Colorado Springs Utilities (CSU) and all other utility providers.
Water and Sewer Districts providing service to fire district residents.
Colorado Springs Fire Department (CSFD) and all auto-aid and mutual aid fire departments.
El Paso County- (EPC)
El Paso County Sheriff's Office- EPCO-SO
El Paso County Public Works.
Pikes Peak Regional Office of Emergency Management (PPROEM).
Colorado Dept. of Transportation- (CDOT)
Colorado State Forest Service- (CSFS)
United States Air Force Academy (USAFA)
USDA Forest Service, Pike National Forest- (USFS)
Abutting Subdivisions to include open spaces and lots.
Abutting private ownerships and businesses.
Special Districts

Monument Fire Protection District

Critical Infrastructure	Action	Partnerships
Water System	Implement water system upgrades to include construction of additional storage tanks as may be determined by all water providers.	
	Install a five feet wide noncombustible border around all water facilities and structures. Implement "Structural Hardening" measures to prevent ember ignitions.	
	Implement defensible space and HIZ fuel treatments around all structures.	
	Maintain access to fire hydrants with 10' of clearance of all fuels. Ensure engine accessibility at roadsides.	

	Install vehicle turn-outs at hydrants that will allow fire engine connection and accommodate passing vehicles.	
Sewer System	Install five feet wide noncombustible border around all buildings and structures. Implement "Structural Hardening" measures to prevent ember ignitions.	
	Mitigate all fuels within 200 feet of all buildings and structures.	
CSU, Mountain View REA and Core REA-Electrical	Upgrade aging facilities. Maintain line clearances.	
Black Hills Energy (CSU?)	Protect above ground facilities. Educate homeowners on meter protection	
CenturyLink	Upgrade system-wide improvements	
Comcast	Maintain pedestals and provide service to unserved areas.	
Other	Participate in the development of additional cell coverage within the community.	
Critical Ingress/Egress Routes		
	Encourage all private road maintenance districts to adopt minimum road widths that will accommodate two full lanes of travel. 24 feet of drivable all-weather surface is recommended.	
	Install additional street signage to aid responding firefighting resources that will not be familiar with the community. Signs are needed at intersections, irregular street configurations, and all dead-end roads. Single-lanes, steep grades, sharp curve radii, and lack of sufficient turn-around areas at dead ends pose a risk to evacuees and responding firefighters.	
	Road sections with only one lane of travel should have vehicle turn-outs that can accommodate multiple vehicles. Locations should be at: 1) Road sections where the on-coming traffic is visible; 2) No more than 400 feet apart on long stretches; or 3) where any impediment to travel may exist (steep grades,	

	deep roadside ditches, tight curves, or private improvements.	
	Treat all native vegetation to shaded fuel break specifications along all main egress route streets to minimum width of 150 feet, each side.	
	In areas with prairie fuels, these should be mowed 30 feet wide on both road sides at least twice per year to a maximum height of 6 inches.	
All Structures (High Priority)		
	Structural hardening against embers required for all structures in MFPD.	
	Implement Home Ignition Zones around all structures.	
	Develop “fire adapted” fuel treatment zones as proposed on the attached map using zones of low/no fuel volumes as boundaries.	
	Interconnect HIZs from home to home and to areas of lower fuel volumes (rock formations, pastures, meadows, etc.	
Critical Forest Fuel Treatments	All properties treated to mitigate ladder fuels and implement forest restoration with the goal of fire adaption.	
	All forest lands and shrublands within 600 to 1,000 feet of district boundaries. See the “Fuel Treatment Zones” map. This includes subdivisions, open spaces, public lands, businesses, and other private properties abutting the community.	
	Manage fuel loading on vacant lots that abut residential areas utilizing grant funds.	
Biomass Treatment Program	Note: Critical for long-term support of communities taking action to mitigate their fuels.	
	Establish a slash disposal program available to all residents of the district. Fund annually. ● Curb-side chipping or pickup. ● Slash/Mulch Site. ● Air curtain burner or other alternative.	
	Establish a seasonal wildfire mitigation crew that may serve as a seasonal fire crew.	

Annual and ongoing events	Educational programs	
	Develop a Five Year Plan outlining priorities and potential costs to be updated annually by the MFPD or active Firewise programs..	
	Maintenance of prairie fuels along egress routes	
	Maintenance of fuel treatments along egress routes	
	Apply for grants or other funds to assist with fuel treatments both inside and outside of the community. This may include distribution and administration of funds.	
	Annual cleanup projects around businesses and residences.	
	Continue slash chipping or other comparable slash removal program.	
	Peak Alerts Signup to receive emergency notifications.	
	Access and Functional Needs Registry for those with special needs (homebound, handicapped, infirm, etc.). NOT currently available.	
Pre and Post-fire Planning		
Monument Creek	Begin engineering assessments of crossing point at all public roads in partnership with relevant road maintenance agencies.	
Internal drainage channels	Begin engineering of any other storm channel crossing points to withstand 100+ year flood event.	
All Roads	Analyze all culvert crossings and roadside ditches for ability to withstand post-fire mud flows. Pre-plan for silt/ash cleanup.	
Utilities Crossing Major Storm Channels	Plan for emergency repairs. Harden all crossing points if road crossings are upgraded to handle 100+ year events.	
All Neighborhoods	Identify areas most prone to post-fire mud and debris flows. Recommend to owners in these areas acquisition of FEMA Flood Insurance.	

The following appendix contains maps of the project areas described above:

NOTE: All of the items listed above are considered essential (high priority) for the protection of life, property and natural resources in and around the fire district. Firefighter safety and effectiveness should be factored into all proposed projects.

- Major Landowners within a half mile wide buffer zone around the fire district (Zone 2).

- Watershed Compartments that drain into the fire district (Zone 3).

The table below lists communities currently active, at some level, with wildfire mitigation. These are covered by this CWPP with base data applicable per the compartment maps. All have been assessed by MFD staff as “at risk of wildfire exposure”. Also covered are any area of two or more properties that cooperate to manage their wildfire risks.

Location	Mitigation Program	Firewise Community
The Timbers HOA	Y	
Red Rocks Ranch HOA	Y	Y
Ridge at Fox Run HOA	Y	
Colorado Estates HOA	Y	
Bent Tree HOA	Y	
Arrowood HOA	Y	
Jackson Ranch HOA	Y	Y
Back of the Winds HOA	Y	
Forest View Acres	Y	
Shiloh Pines	Y	Y
Hilltop Pines	Y	
Arrowood III	Y	Y
Gleneagle North	Y	
Black Forest Park	Y	

Benet Lane	Y	
Pleasant View Estates Service Club	Y	Y
Tall Pines Ranch	Y	Y
Cherry Creek Crossing	Y	
Struthers Loop	Y	
Canterbury Estates	Y	
Sun Hills Estates	Y	
Timberedge Ln	Y	
Red Rock Reserve	Y	
Wissler Ranch	Y	Y
Sanctuary Pointe	Y	Y
Promontory Pointe	Y	
Higby Estates	Y	Y
Abert Estates	Y	
Woodmoor Improvement Assoc.	Y	Y
Mount Herman	Y	Y
High Forest Ranch	Y	Y
Gleneagle Civic Assoc.	Y	
Fox Pines	Y	
Walden		
Hawkridge		
Kings Deer		

Jackson Creek		
Hay Creek		
Green Mountain Estates		
Location	**Mitigation Program**	**Firewise Community**
Willow Springs Ranch		
Chaparral Hills		
Forest Lakes		
Jackson Creek North		
Cloverleaf		
Home Place Ranch		
Grandwood Ranch		
Misty Acres		
Meadows at Monument Lake		
Lake of the Rockies		
Brookmoor Estates		
Cherry Springs Ranch		
Searle Ranch		
Valley Ridge		
Pastimes		
Wagons West		
Trails End		
Multiple Unnamed Areas		

Summary of MFD subdivided properties:

- 18441 divided properties in the fire district
- Approximately 75% of properties are residential

Wildfire Mitigation and Homeowner Association Information

MFD contains many HOAs that have restrictive covenants or architectural control documents that may be impediments to individual homeowner wildfire mitigation activities as recommended by MFD, CSFS or other resources. The section below is included here as a tool to allow these owners to take appropriate measures. Also included is suggested language for existing and future HOAs to consider for adoption or modification of their governing documents.

Homeowner Bill of Rights

The following is an excerpt from Senate Bill 100, often referred to as the "Homeowner Bill of Rights" and included in the Colorado Revised Statutes section "Colorado Common Interest Ownership Act" (CCIOA or "Kiowa" for short.)

SB-100 language

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

NOTE: While this statute allows homeowners within HOAs to implement wildfire mitigation actions, all steps outlined in the section must be followed or the homeowner may be at risk of a covenant violation. To remain in compliance, the following steps must be followed:

1. If proposed mitigation actions are planned, the homeowner must follow required procedures for submittals to the HOA,

2. If denied by the HOA, the homeowner must obtain a written defensible space plan (DSP) from one of the referenced agencies or approved individuals (AAI).
3. The plan must be submitted to the HOA, again per its submittal requirements.
4. Any changes to the DSP, if requested by the HOA, must be approved by the AAI prior to homeowner actions.
5. If the AAI does not provide consent to the HOA requested modifications, then the DSP, as submitted, becomes the final approved DSP.
6. All steps outlined above should be documented and must be followed before any mitigation actions are taken, or the homeowners will be in violation of the covenants.

Suggested Wildfire Mitigation Language for Covenant Controlled Communities

Covenants, Conditions and Restrictions (“CC&R’s” or “Covenants”) typically run with the land and create the obligation to adhere to a set of rules. The subdivider, developer or home builder records these in the county public records and become part of a property owner’s title to the land. A Homeowners Association (“HOA”) is also formed as the enforcement mechanism for the HOA. A major concern is the long-term implementation by the HOA of measures necessary for public safety. In this case, wildfire is the known risk.

Covenants are often difficult to modify due to requirements for approval by a majority of all owners. In some cases, a “super-majority” may be required. Language is suggested below for use in covenants for future subdivisions that can allow HOAs to implement and manage their wildfire risks.

HOAs may also be governed by other documents that do not require approval by a majority vote of all owners. If an HOA Board of Directors (“BOD”) is established, it may follow By-Laws that it can be modified by a majority vote of the BOD.

A second layer of governing documents are the Design Guidelines (“DG”) that can usually be modified by a majority BOD vote. The covenants may also call for establishment of an Architectural Control Committee (“ACC”), governed by the BOD, and tasked with enforcement of the DGs. It should be noted that DGs are rarely recorded against a title to land. Most importantly, these can often be changed by the ACC and adopted by the BOD. With regard to adoption of wildfire risk management recommendations or requirements, the DG is the best mechanism for modifications. Suggested language for DGs is provided below.

Covenants

The following are recommendations of language for consideration in future covenants:

1. Wildfire is a natural part of the ecosystem and requires that homeowners take measures to protect structures and the forest.
2. All owners have the responsibility to maintain their properties in such a manner to reduce wildfire risk to their properties and adjacent common areas as may be determined by the local fire authority.
3. Tree cutting is permitted for the purpose of promoting forest health, improving wildlife habitat, controlling insects and diseases, and reducing wildfire risk to homes and the forest. Tree removal shall follow recommendations of a professional forester, natural resource manager or fire authority.
4. The Association shall establish a Firewise Committee comprised of residents, a local fire official, and a natural resource professional. The ACC may serve in this capacity if a local fire official and natural resource manager are used as part of the site and landscape plan reviews.
5. The Association shall establish an annual budget and assess its members for the operation and maintenance of common areas, gates, emergency access and wildfire prevention measures.
6. Access is hereby granted to the Local Fire Authority for the purpose of inspecting and insuring conformance by the Association of maintenance of facilities, common areas, tracts, right-of-ways and easements to insure safe ingress and egress from the community.
7. Failure to comply with local fire regulations shall be considered a violation of the Uniform Fire Code and enforceable by the Fire Authority through remedies available to it.
8. Homeowners agree to abide by Firewise guidelines adopted by the Colorado State Forest Service for building, landscaping and living in wildfire prone areas, as may be amended from time to time.
9. Fire may be used as a tool for maintenance of properties and common areas under the direction of the local fire authority. Any use of fire shall require a plan and permit from the fire authority.

Design Guidelines

If an ACC is established under the CC&R's, the ACC, or its agent, is often the enforcer of rules established by the CC&R's and Design Guidelines. This can be an important amendable document for insuring Firewise development. The items listed above should also be added if it is not possible to amend the covenants. Other important wildfire related language:

1. All structures shall follow Wildfire Mitigation or Firewise guidelines established by the Colorado State Forest Service or other Emergency Service Providers. Alternatives may

be considered If deviating from established guidelines. Technology, information and building materials are constantly evolving that may allow for suitable alternatives.

2. Forest Management activities shall be done under the direction of a professional forester, natural resources manager, or trained fire professional. Such plans shall be submitted to the ACC for its approval, which shall not be unreasonably withheld.

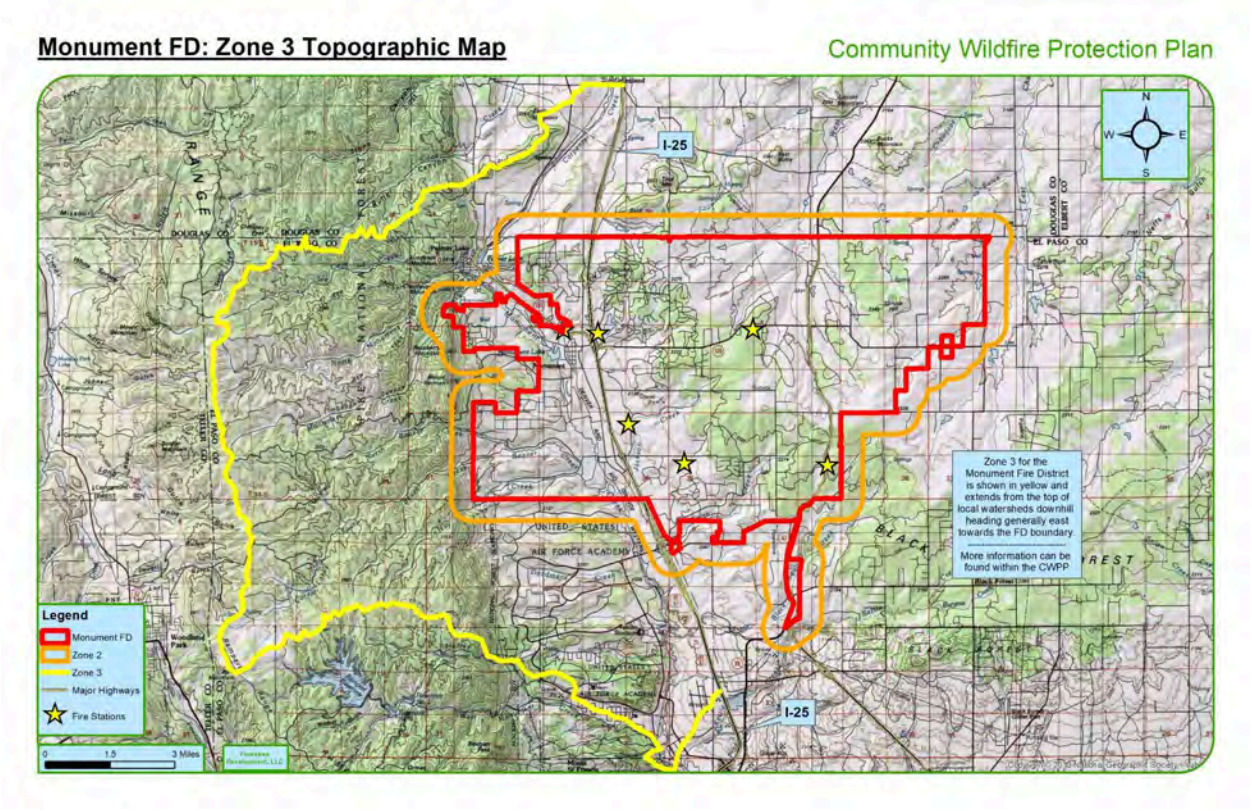
3. Wildfire mitigation activities shall include provisions for forest health, wildlife habitat protection, aesthetics, privacy, and protection of property values.

4. Provisions for maintenance of the defensible spaces, structures and driveways shall be included in building plans, site plans and landscape plans. Both “Defensible Space” and “Home Ignition Zone” should be addressed in all plan submittals.

Appendix B:

Monument Fire Protection District

CWPP Maps



Zone Map

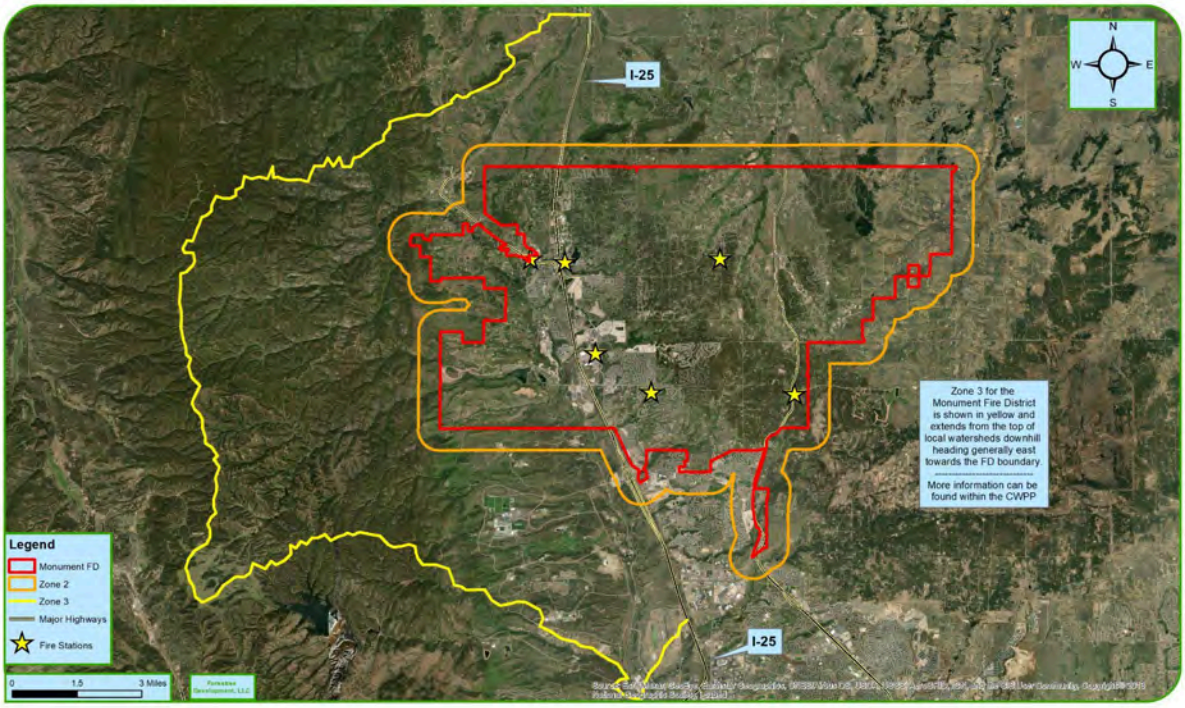
Zone 1- Fire District Boundary (red line)

Zone 2- Wildfire Impact Zone. Wildfires in this zone can have an immediate impact on the fire district. USAFA, CDOT and USFS projects are within this zone.

Zone 3- Wildfire Influence Zone. Wildfires in this zone can spread to the fire district. Post-fire impacts such as mud, ash and debris flows can impact watersheds and downstream infrastructure.

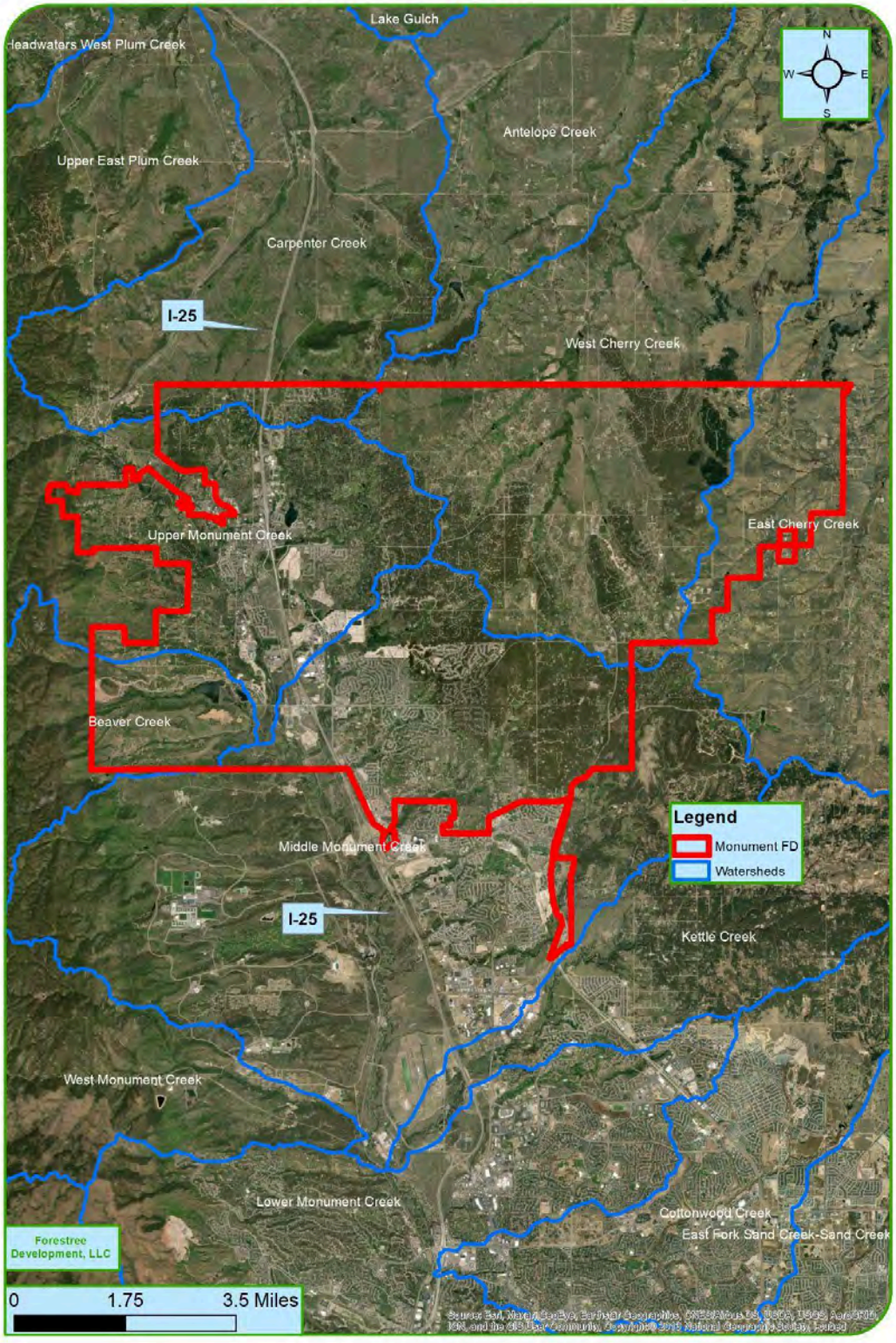
Monument FD: Zone 3 Map

Community Wildfire Protection Plan

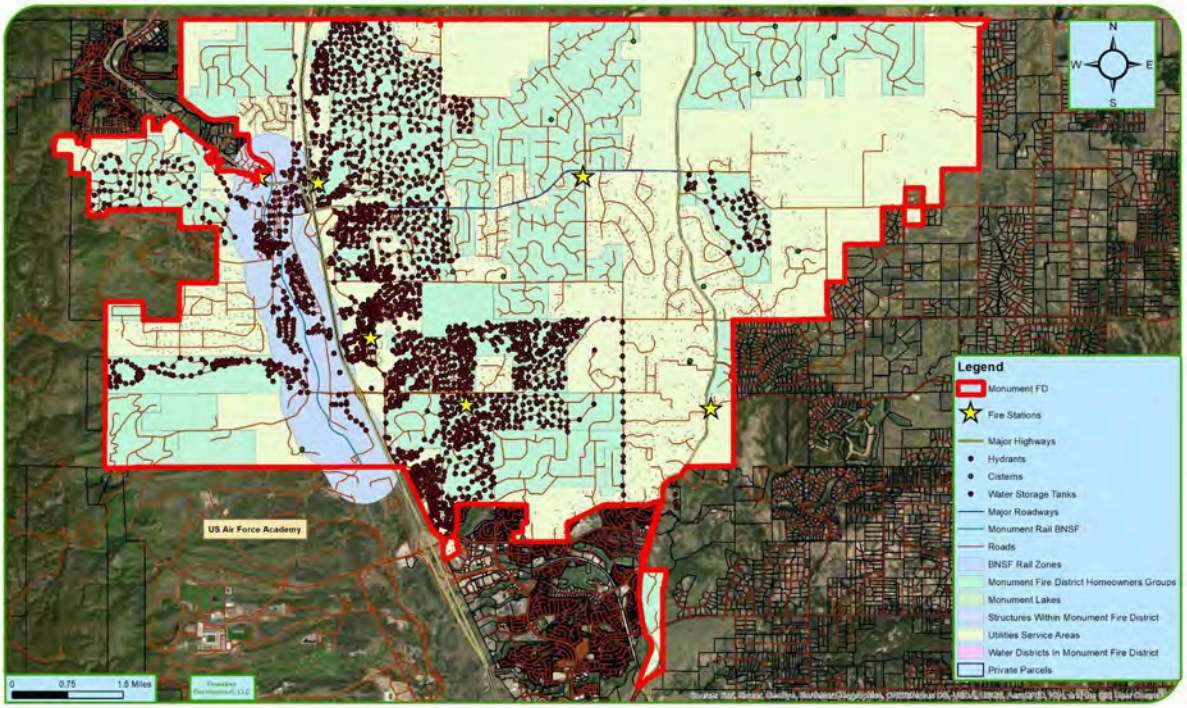


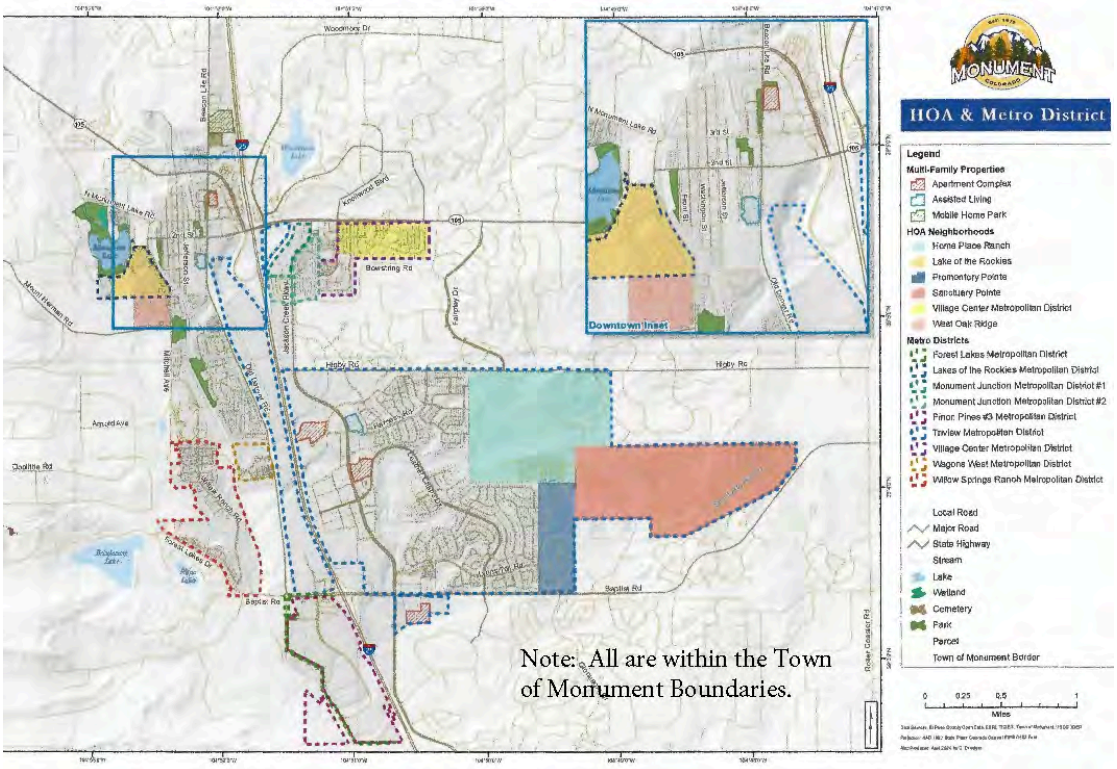
Community Wildfire Protection Plan

Monument FD: Watersheds Map

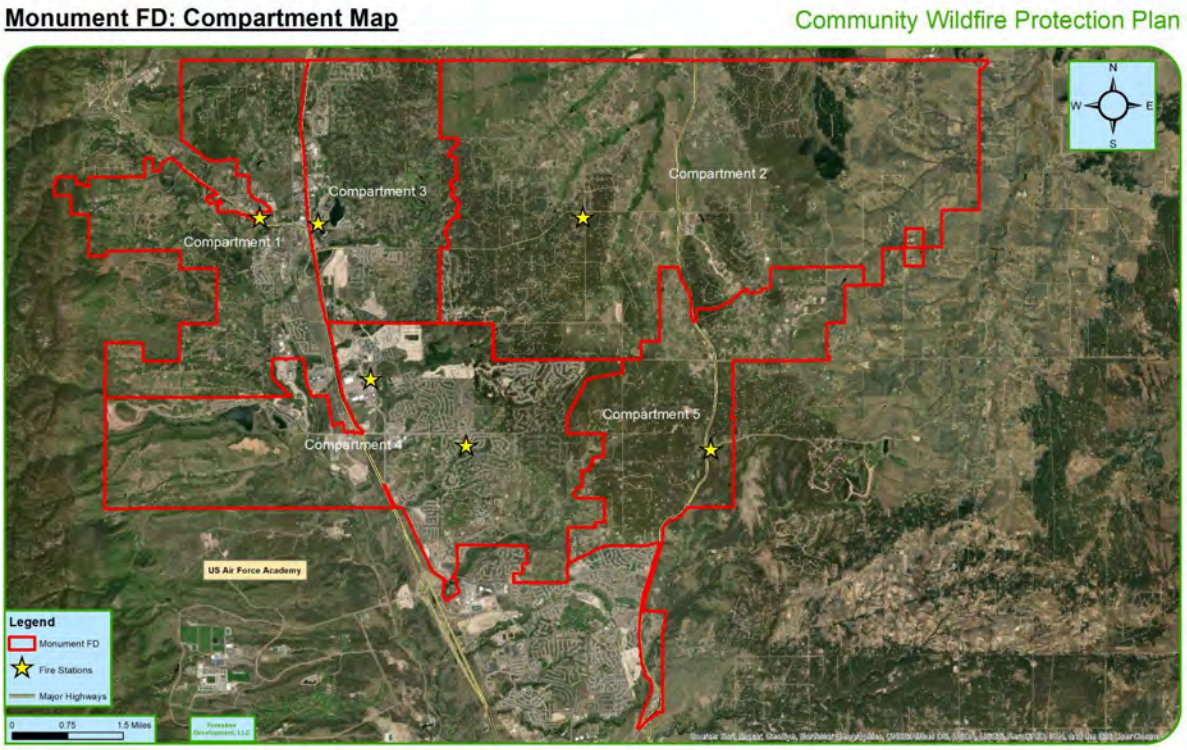


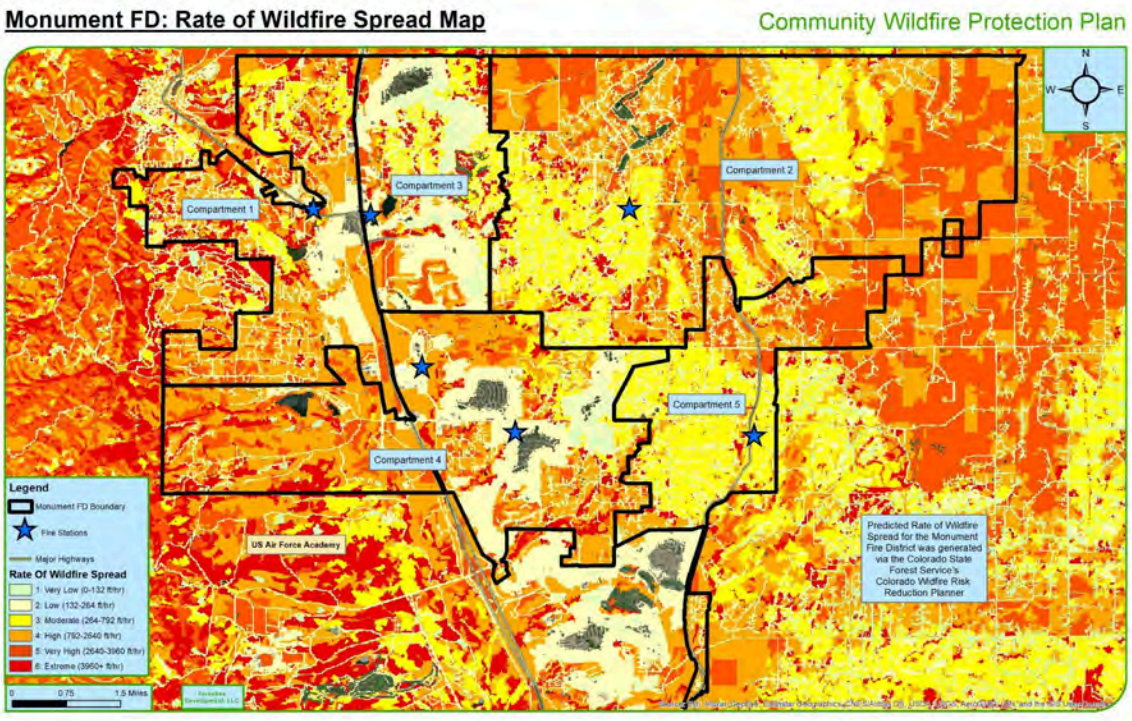
Monument FD: Neighborhood Map Community Wildfire Protection Plan

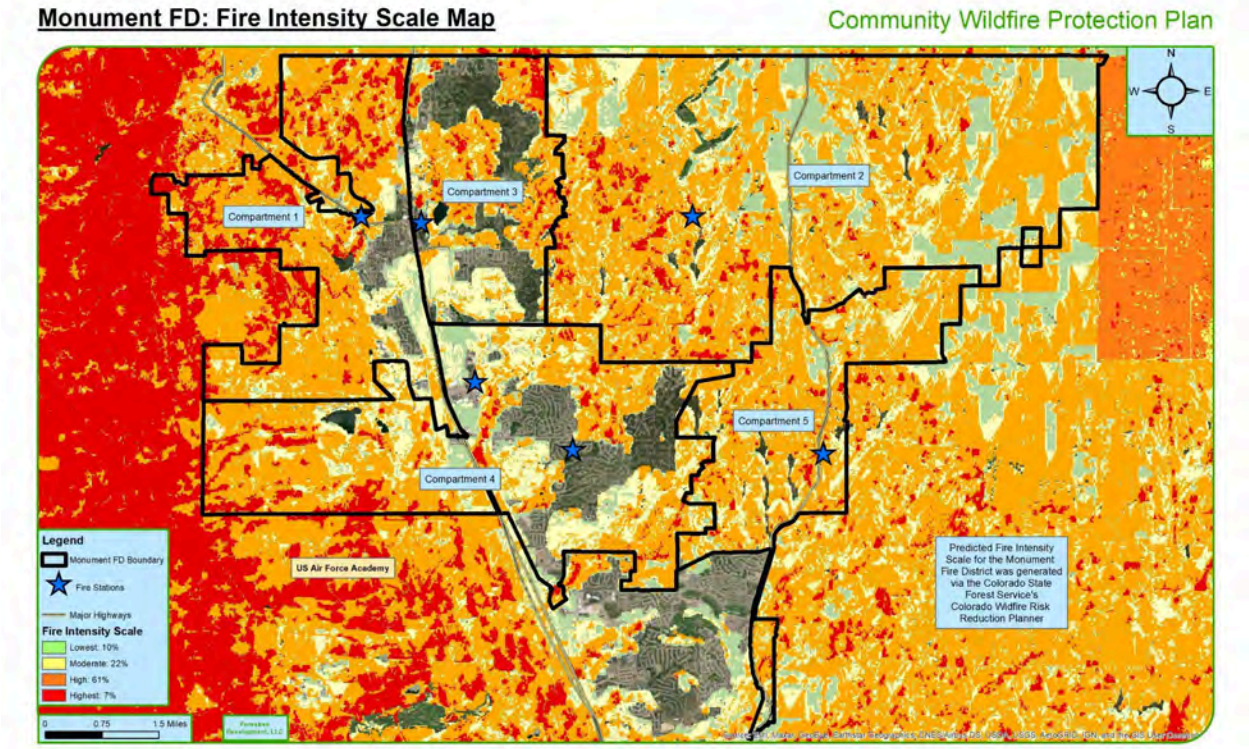




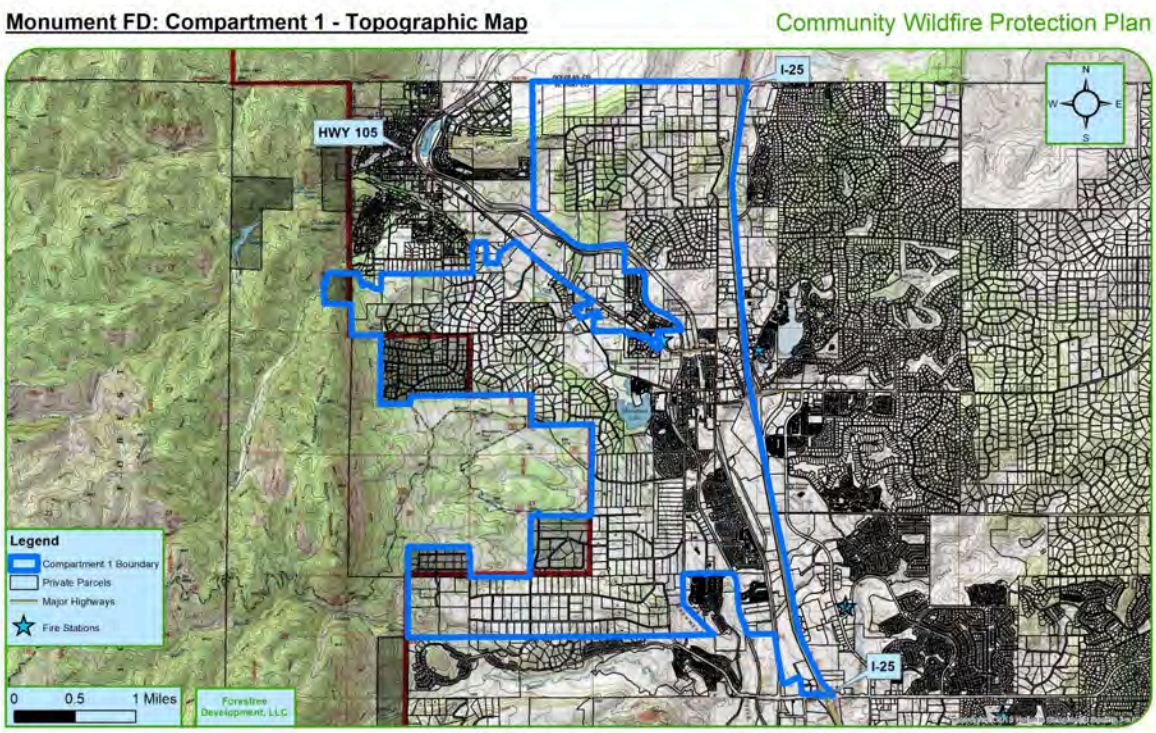
MFPD Overall Maps- Compartments based on Station Response Areas.



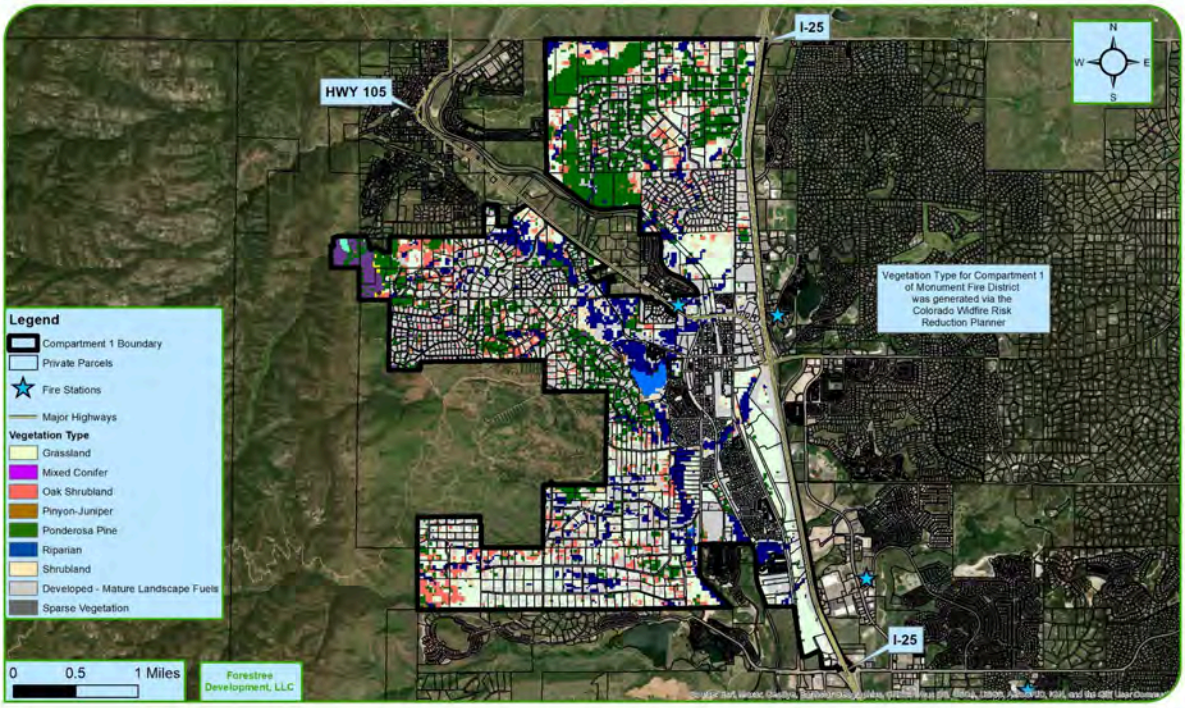




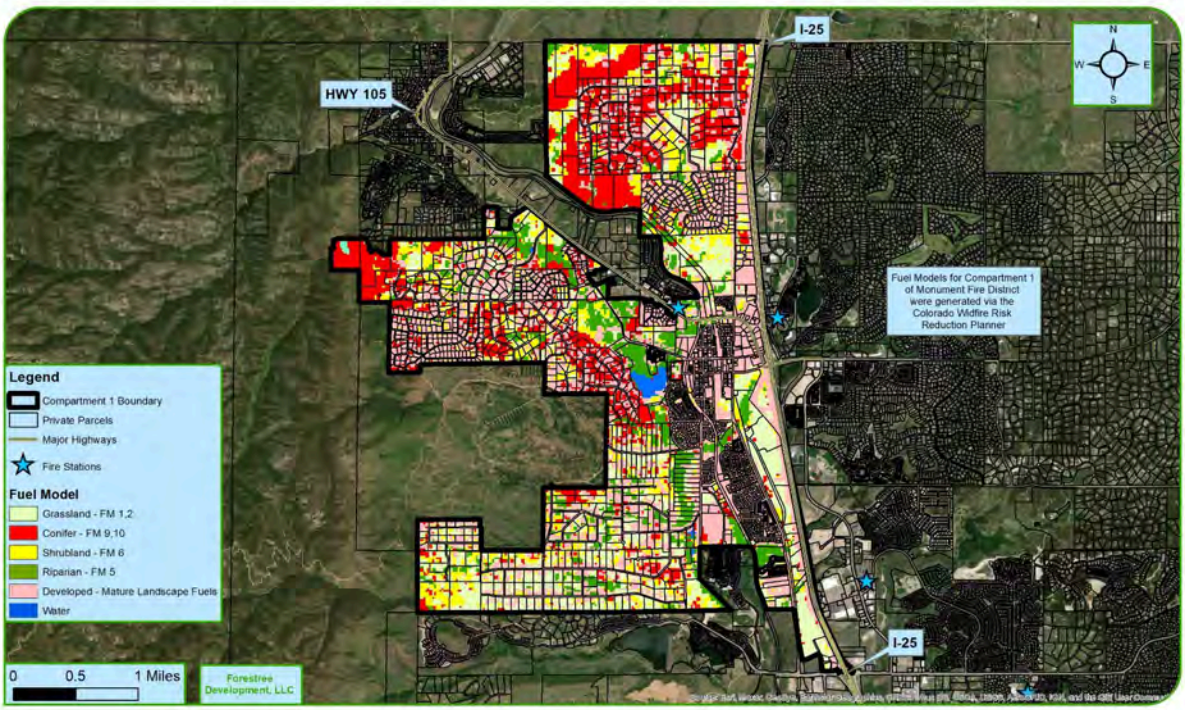
Compartment 1



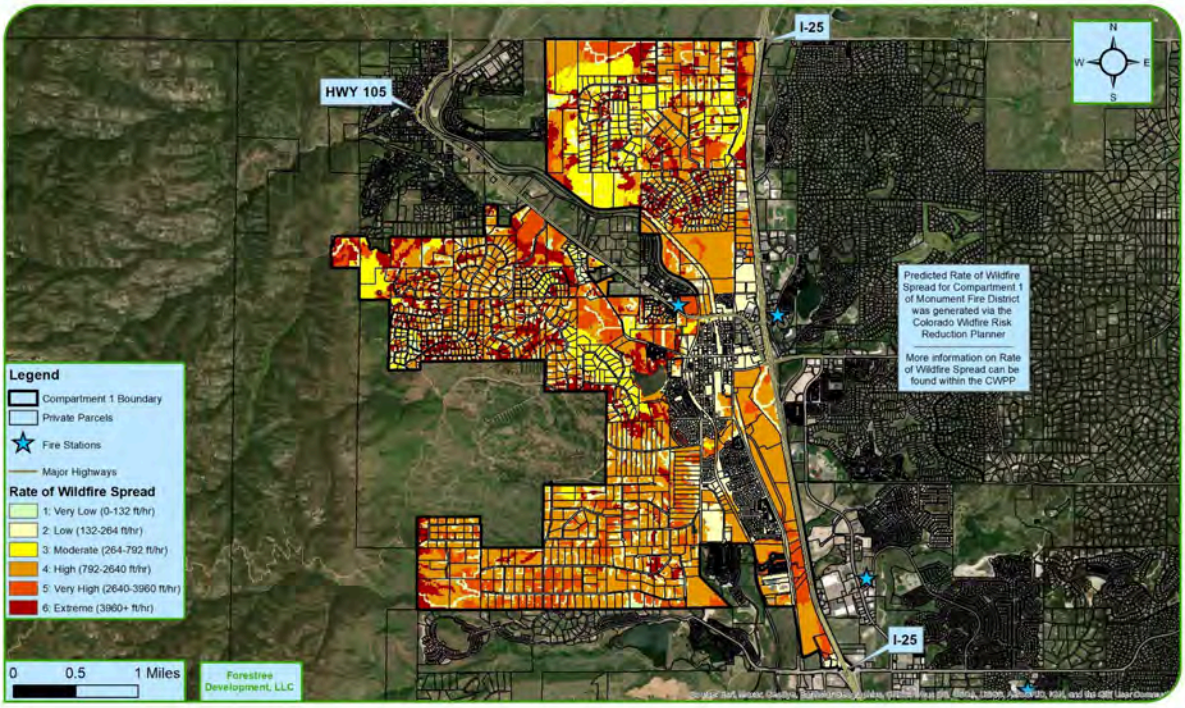
Monument FD: Compartment 1 - Vegetation Type Map Community Wildfire Protection Plan



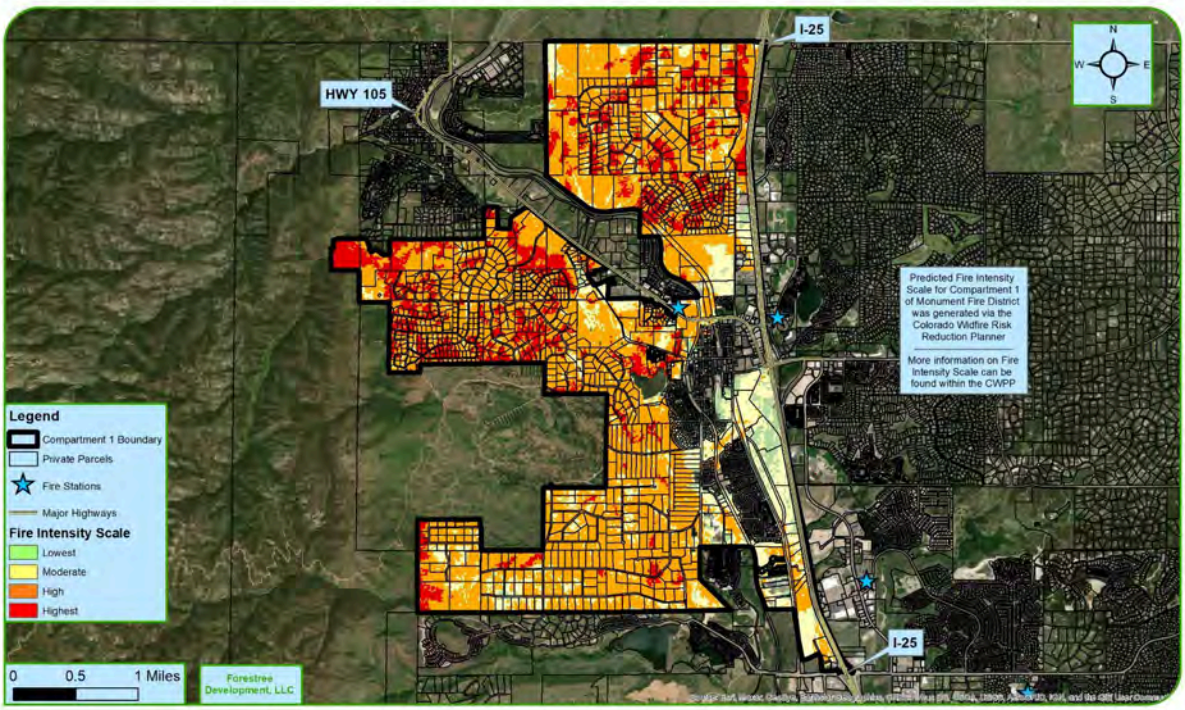
Monument FD: Compartment 1 - Fuel Model Map Community Wildfire Protection Plan



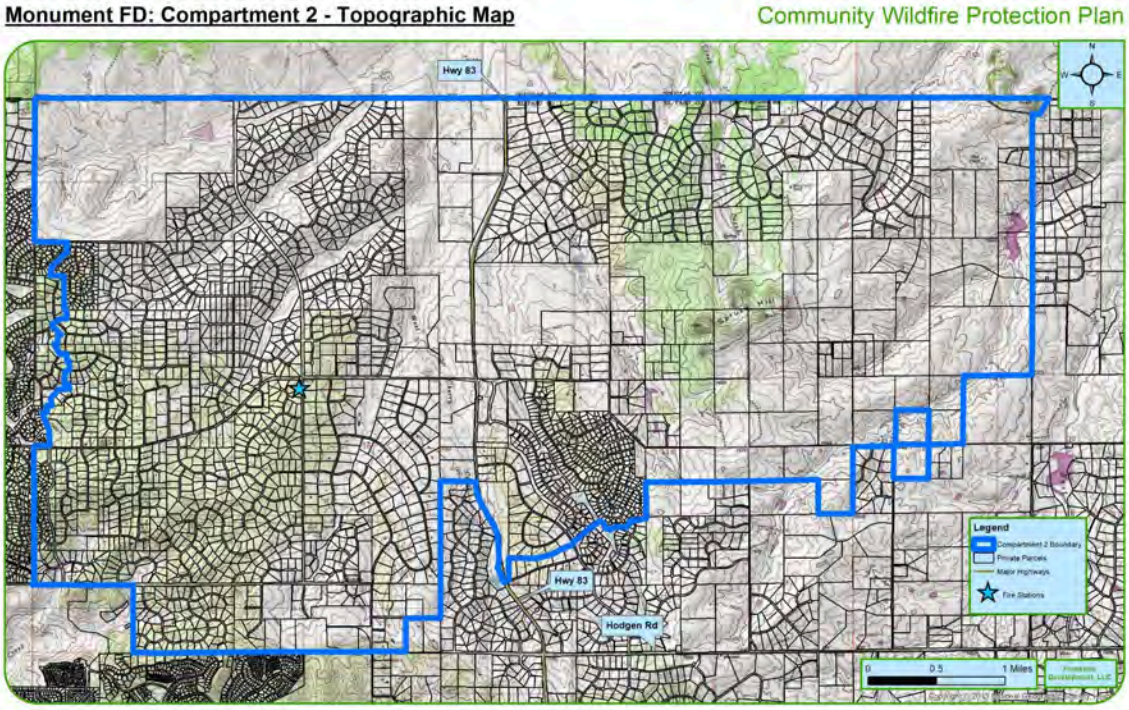
Monument FD: Compartment 1 - Rate of Wildfire Spread Map Community Wildfire Protection Plan

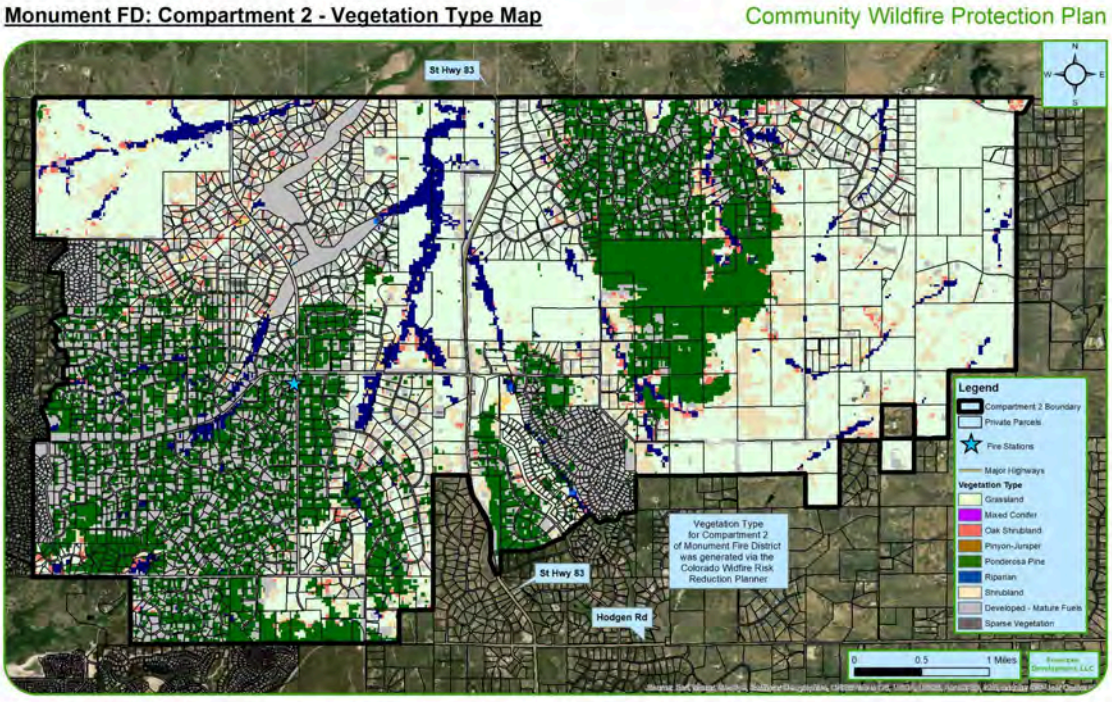


Monument FD: Compartment 1 - Fire Intensity Scale Map Community Wildfire Protection Plan

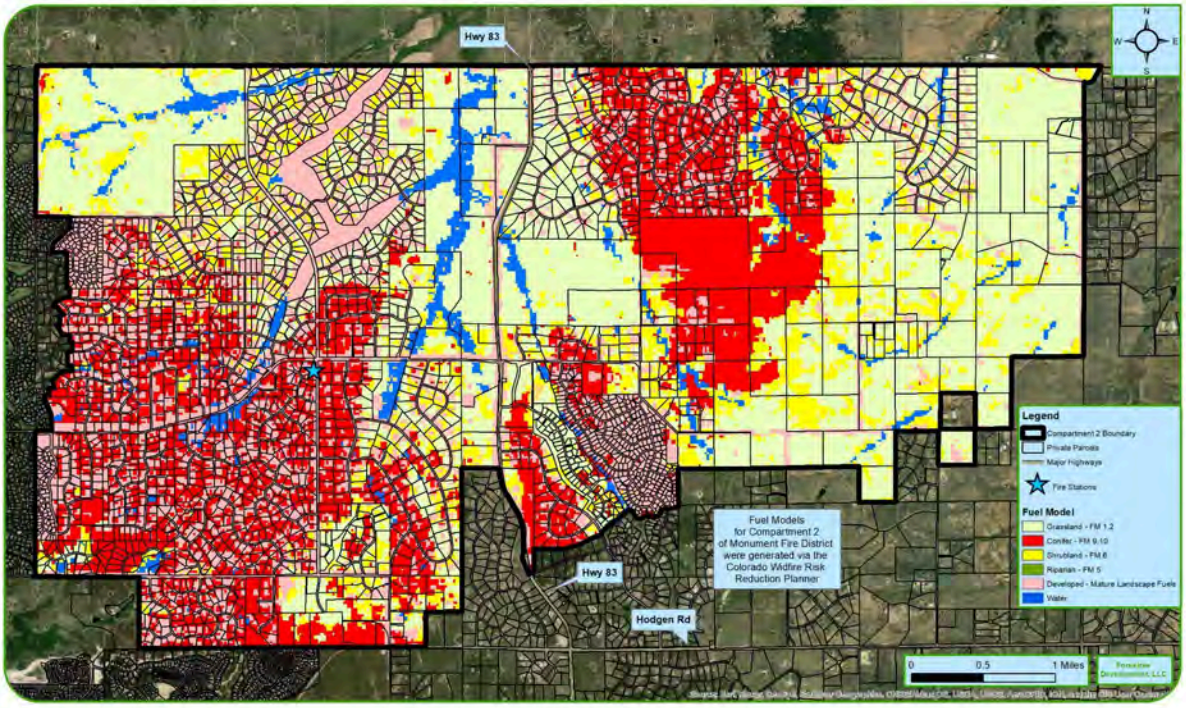


Compartment 2

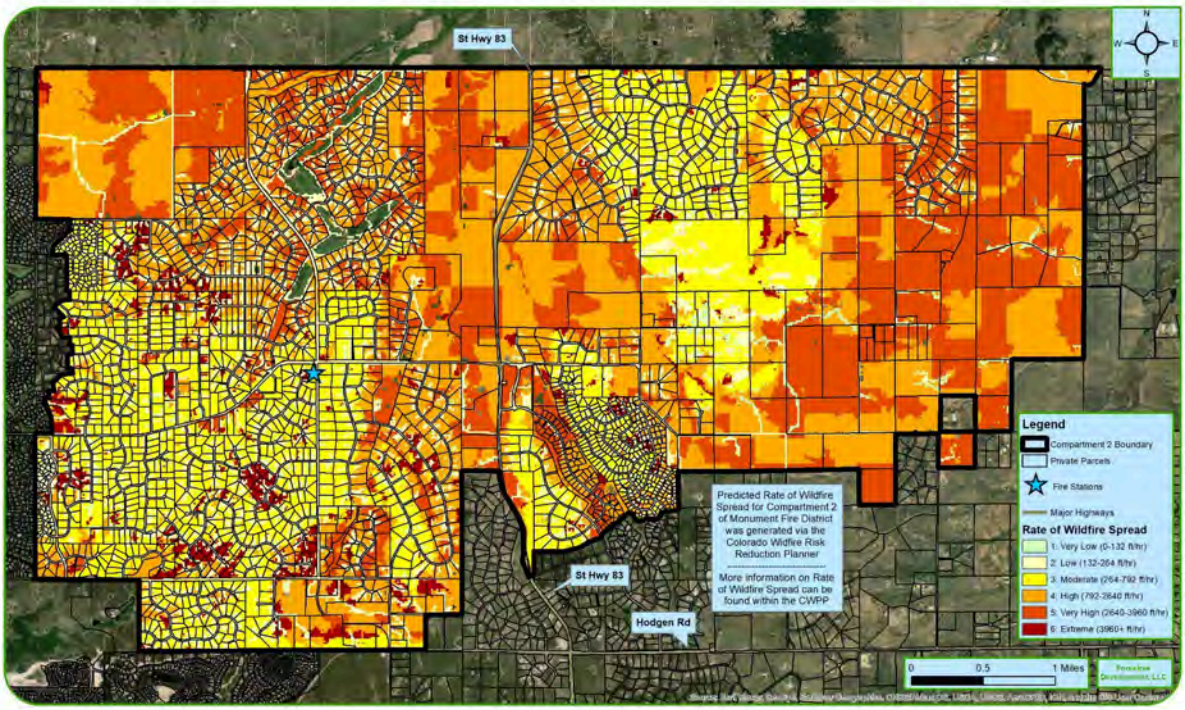


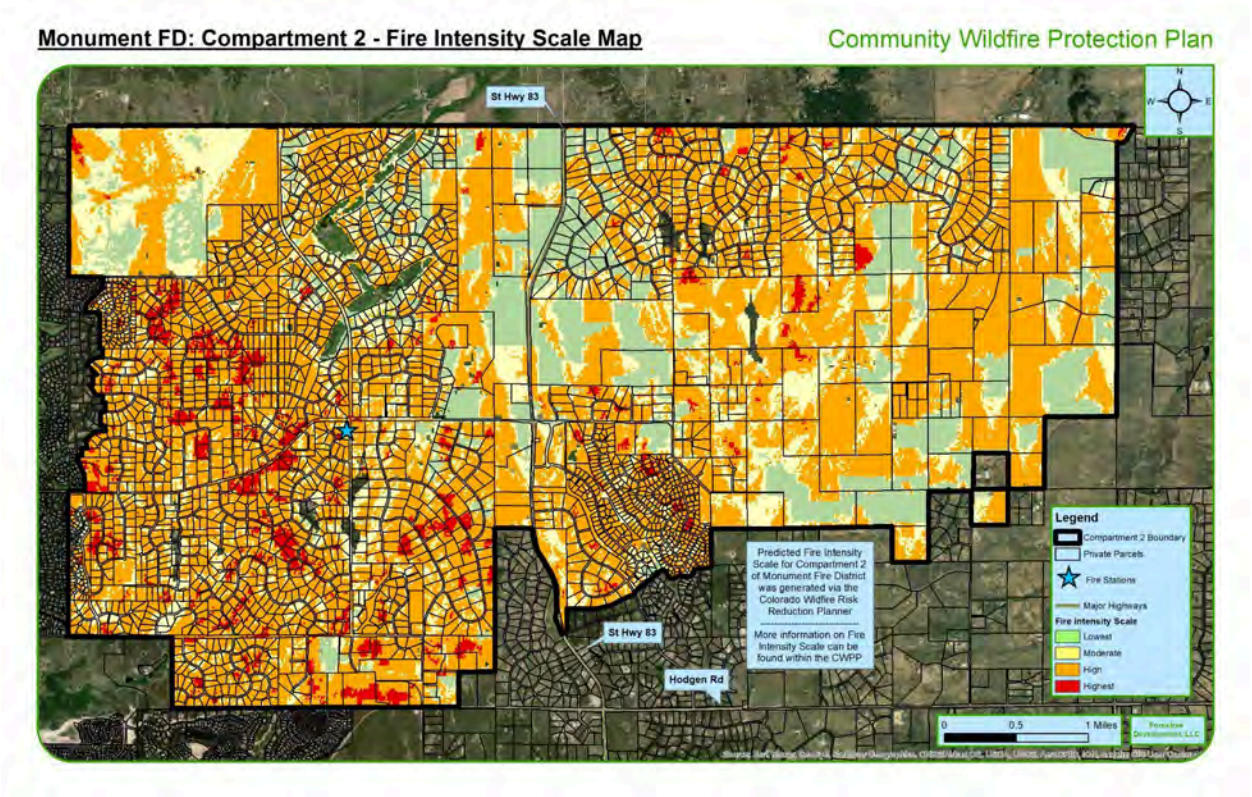


Monument FD: Compartment 2 - Fuel Model Map Community Wildfire Protection Plan

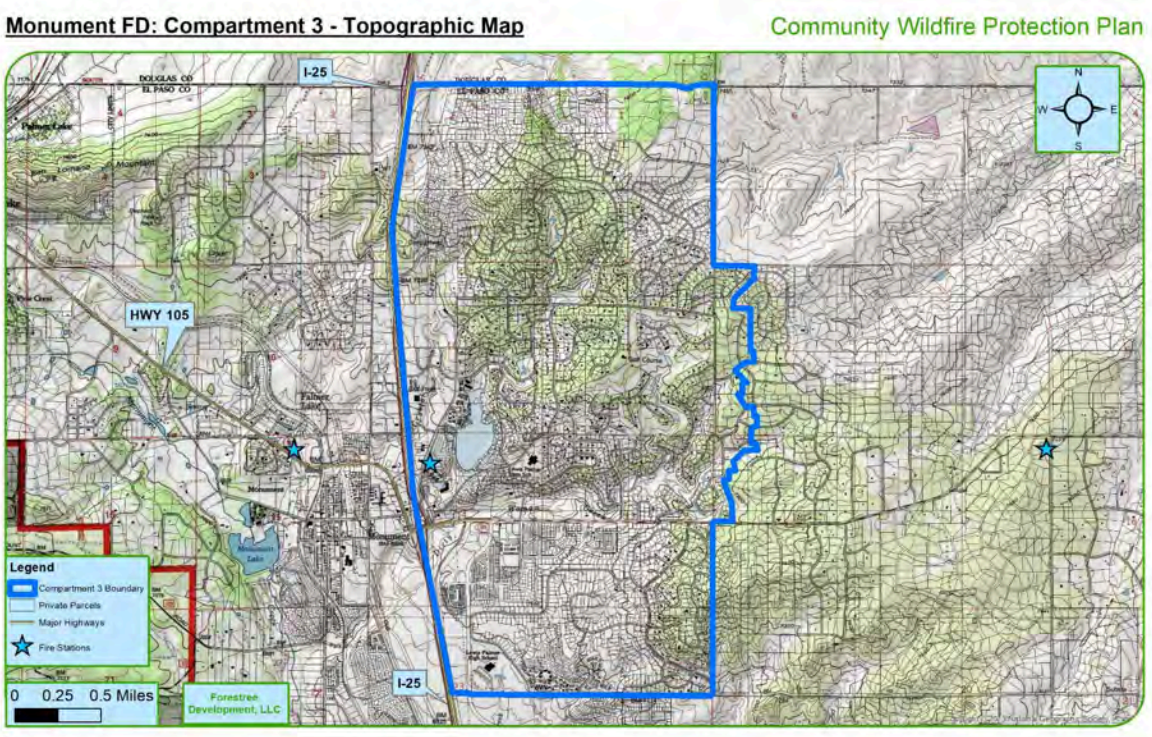


Monument FD: Compartment 2 - Rate of Wildfire Spread Map Community Wildfire Protection Plan

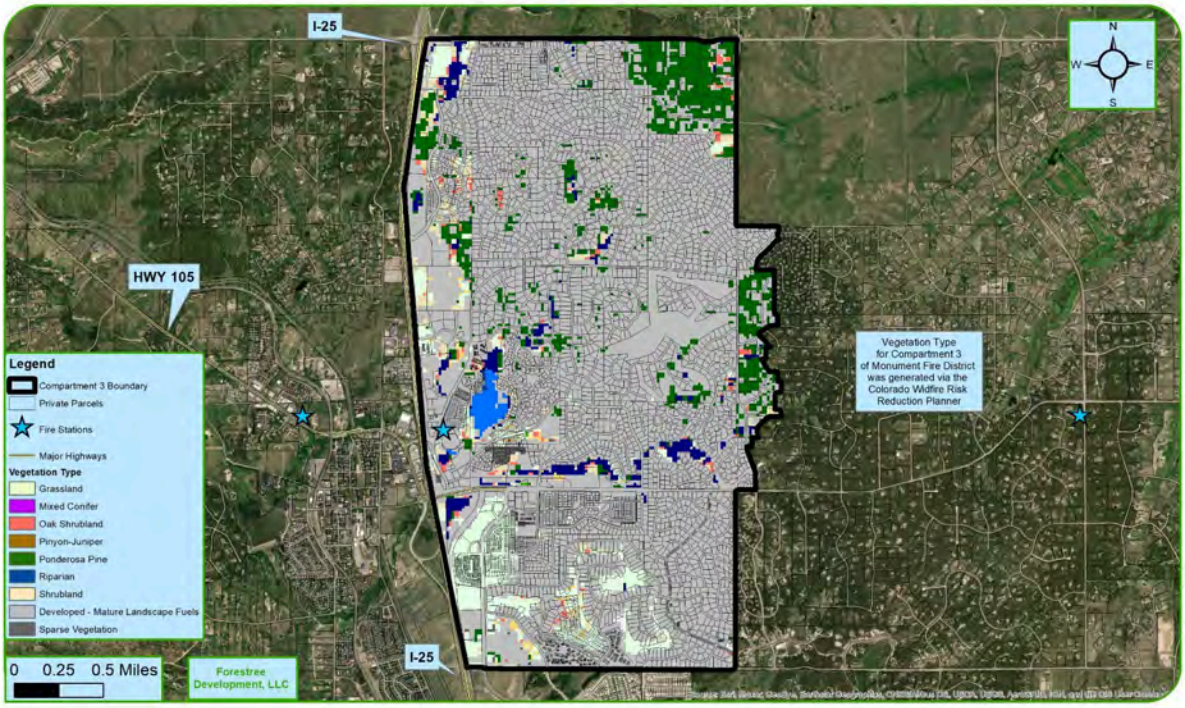




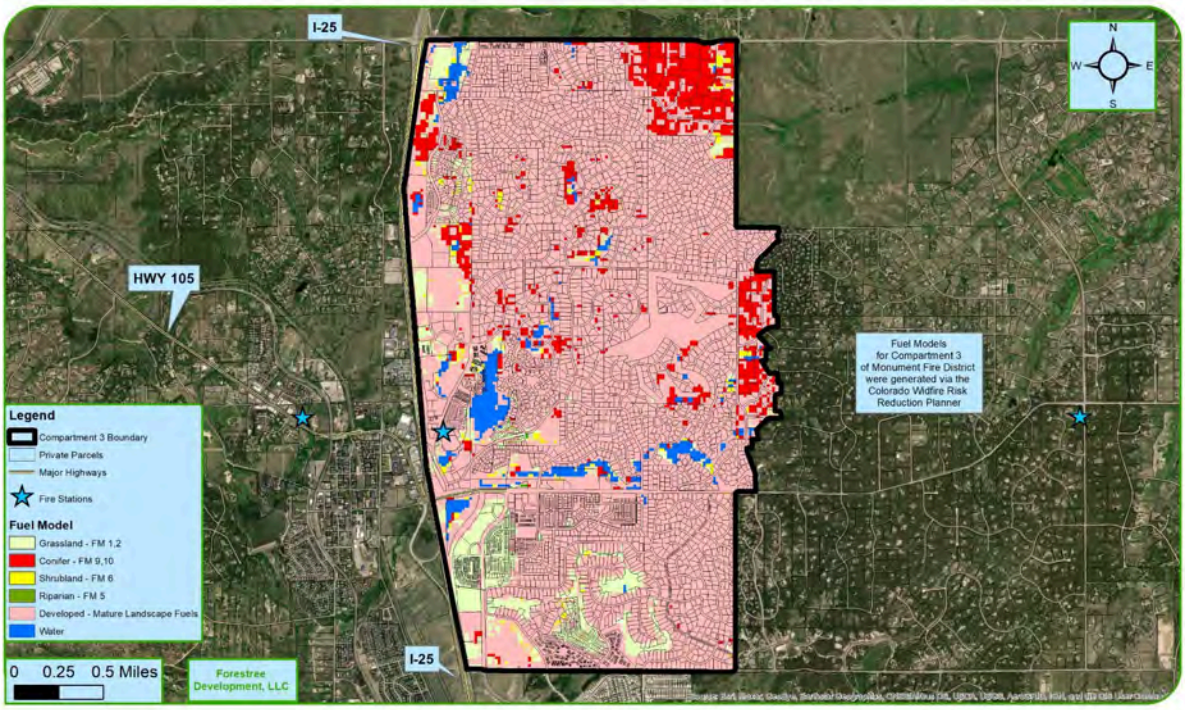
Compartment 3



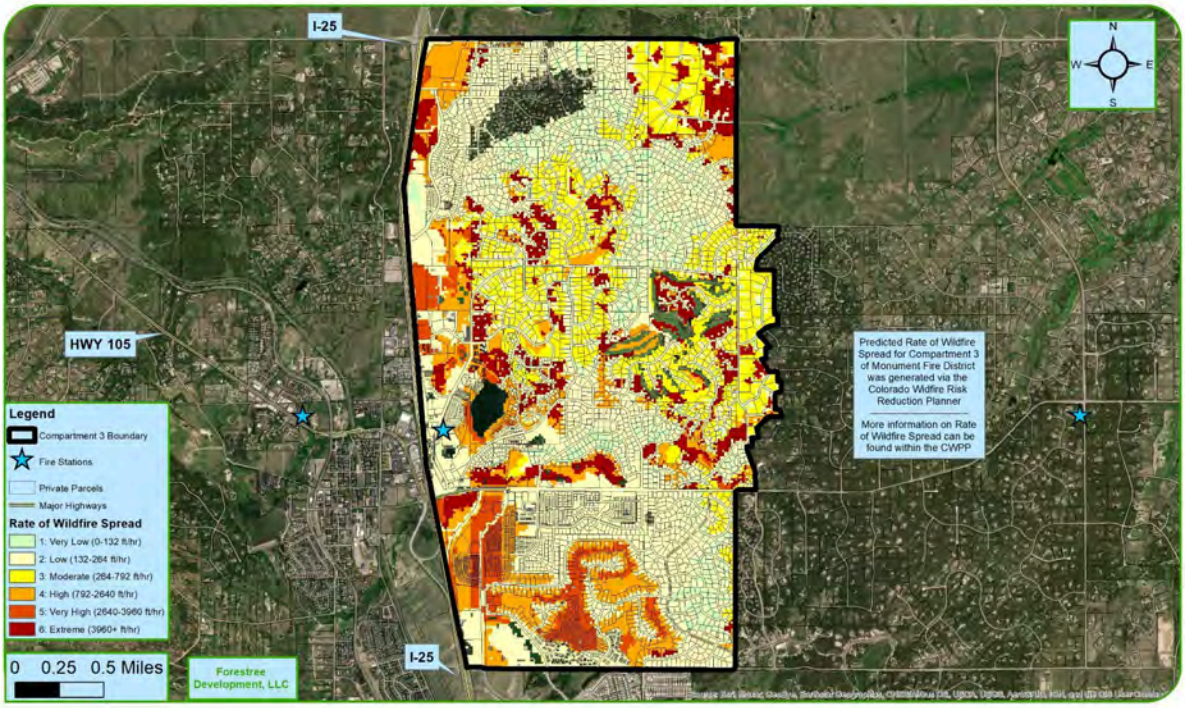
Monument FD: Compartment 3 - Vegetation Type Map Community Wildfire Protection Plan



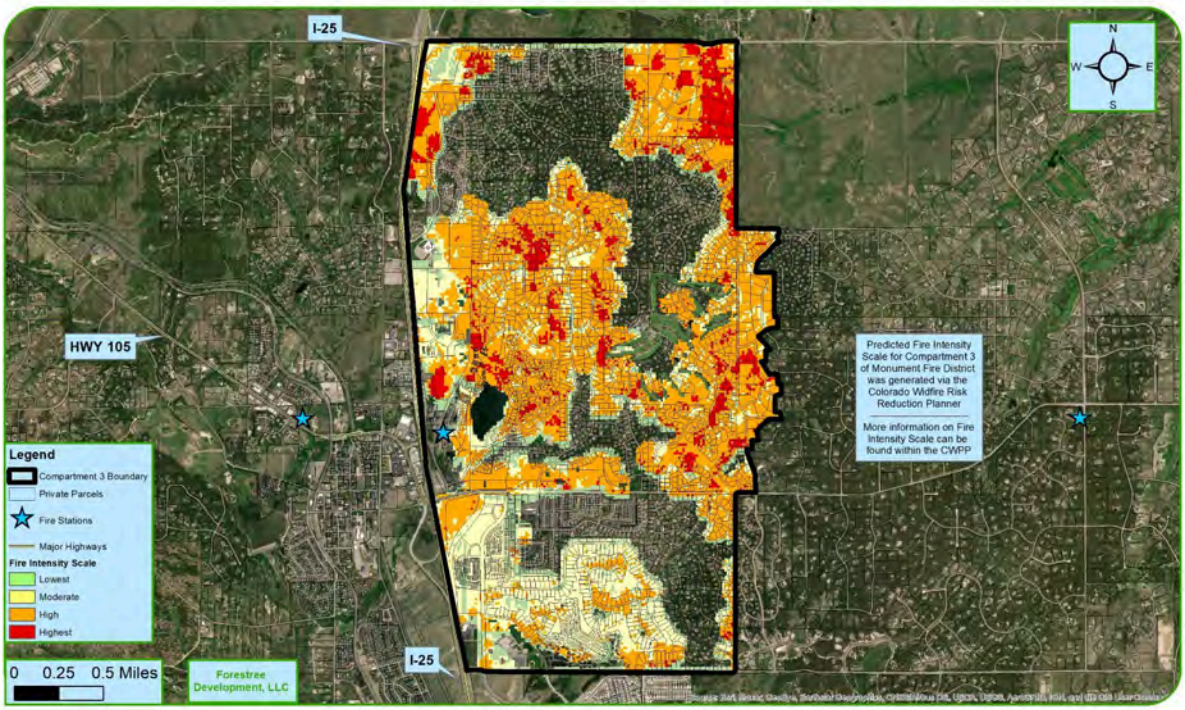
Monument FD: Compartment 3 - Fuel Model Map Community Wildfire Protection Plan



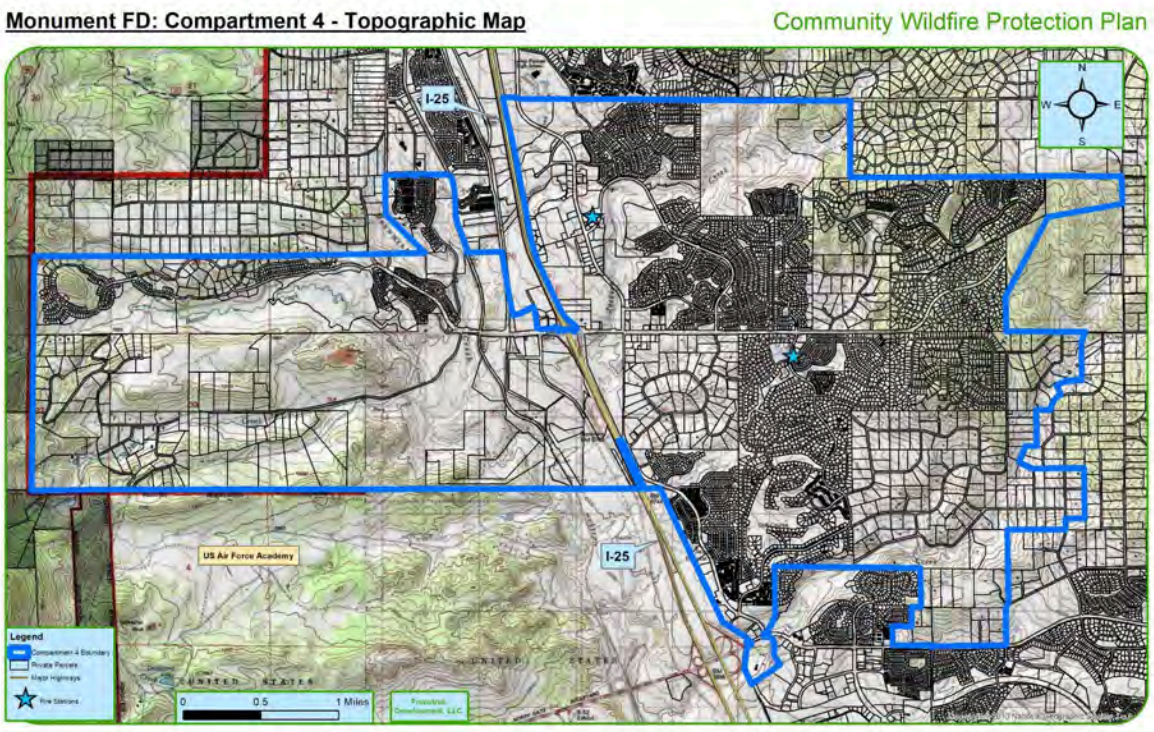
Monument FD: Compartment 3 - Rate of Wildfire Spread Map Community Wildfire Protection Plan

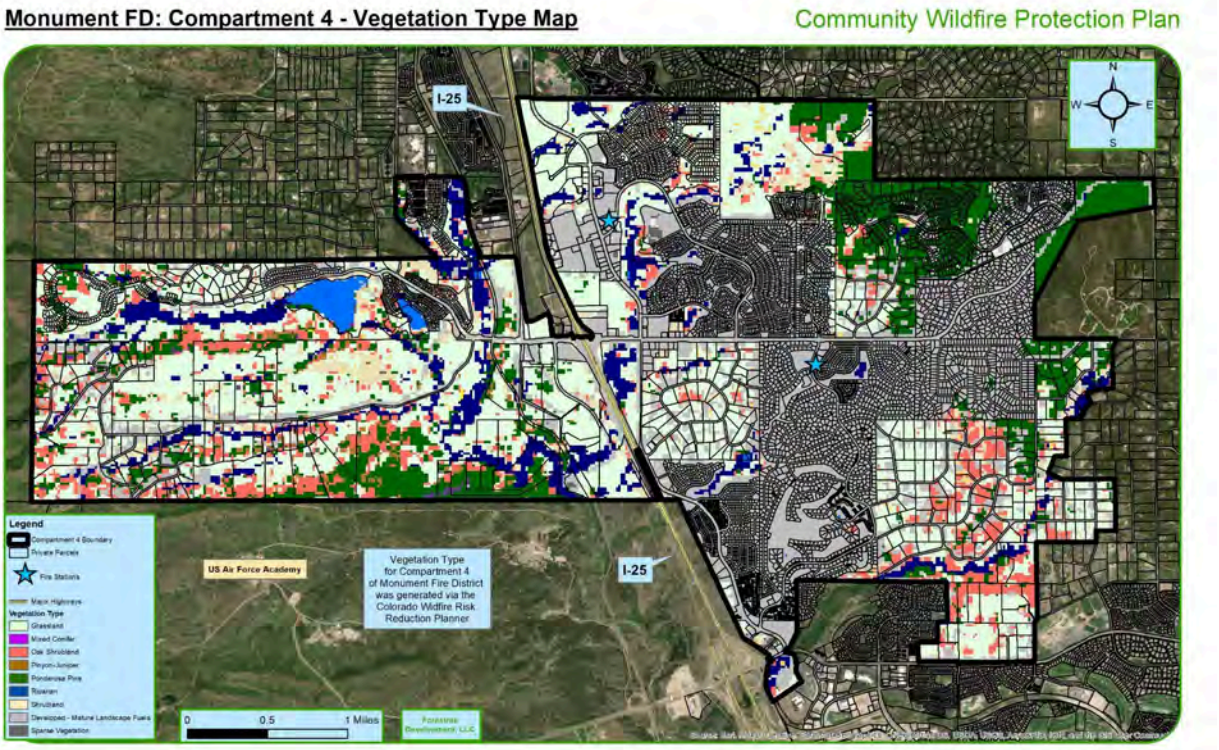


Monument FD: Compartment 3 - Fire Intensity Scale Map Community Wildfire Protection Plan

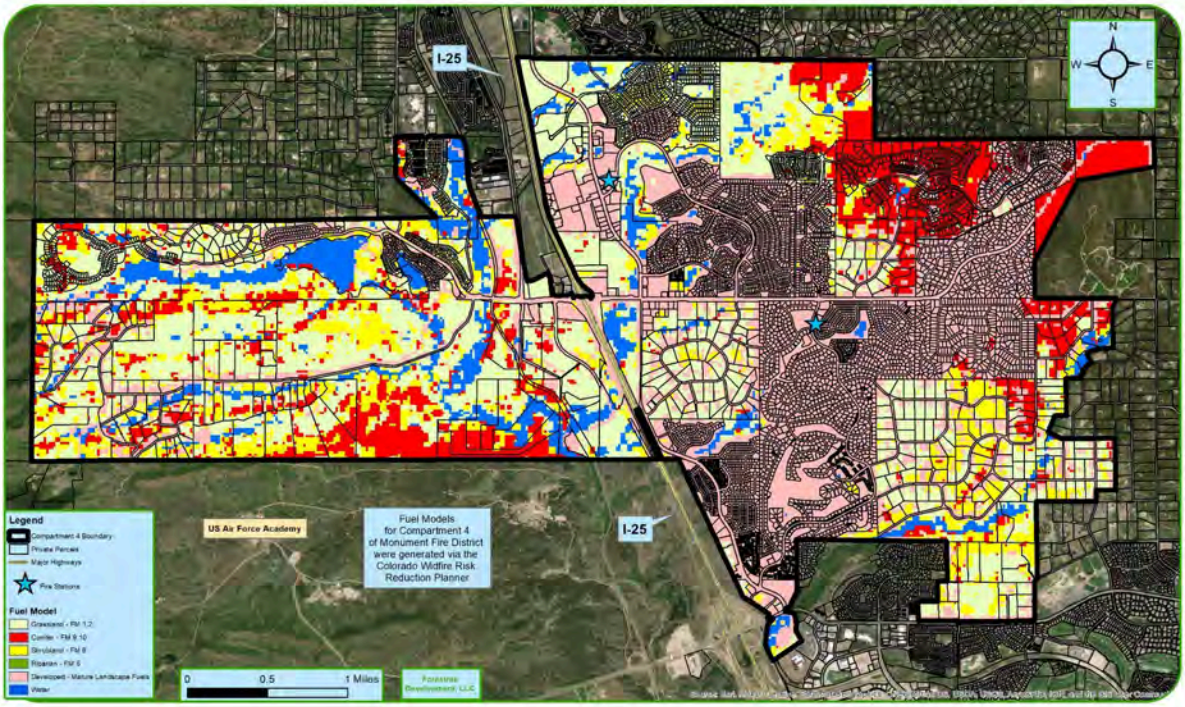


Compartment 4

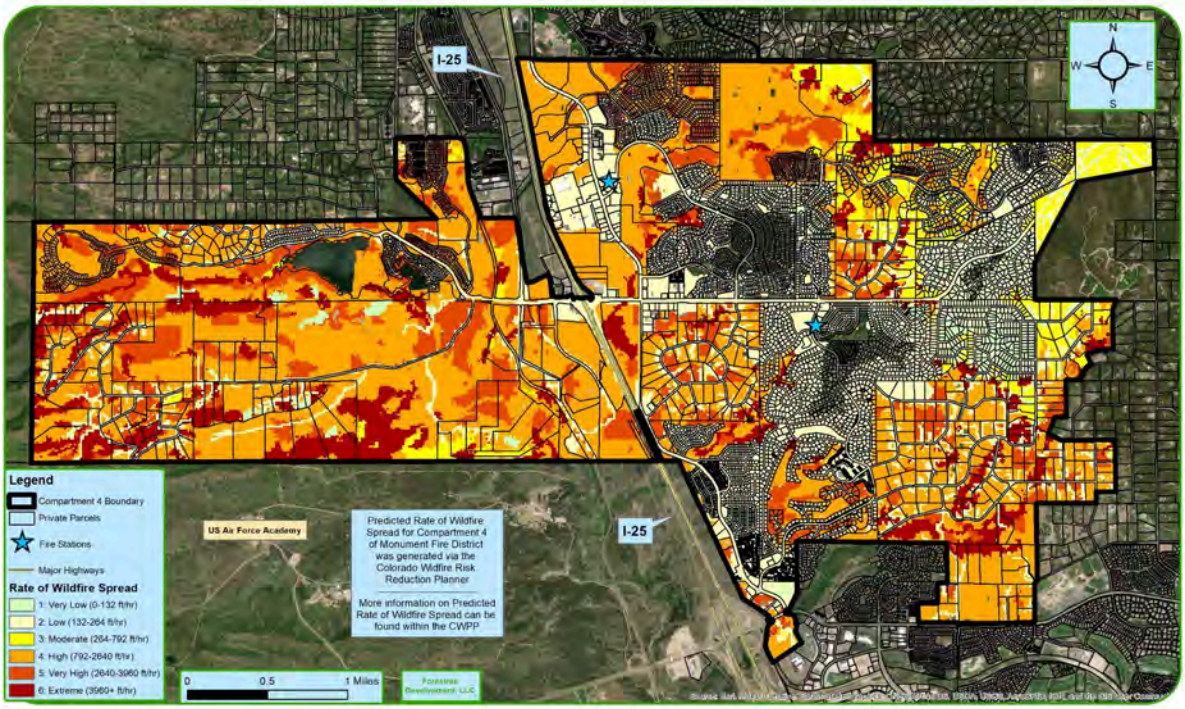


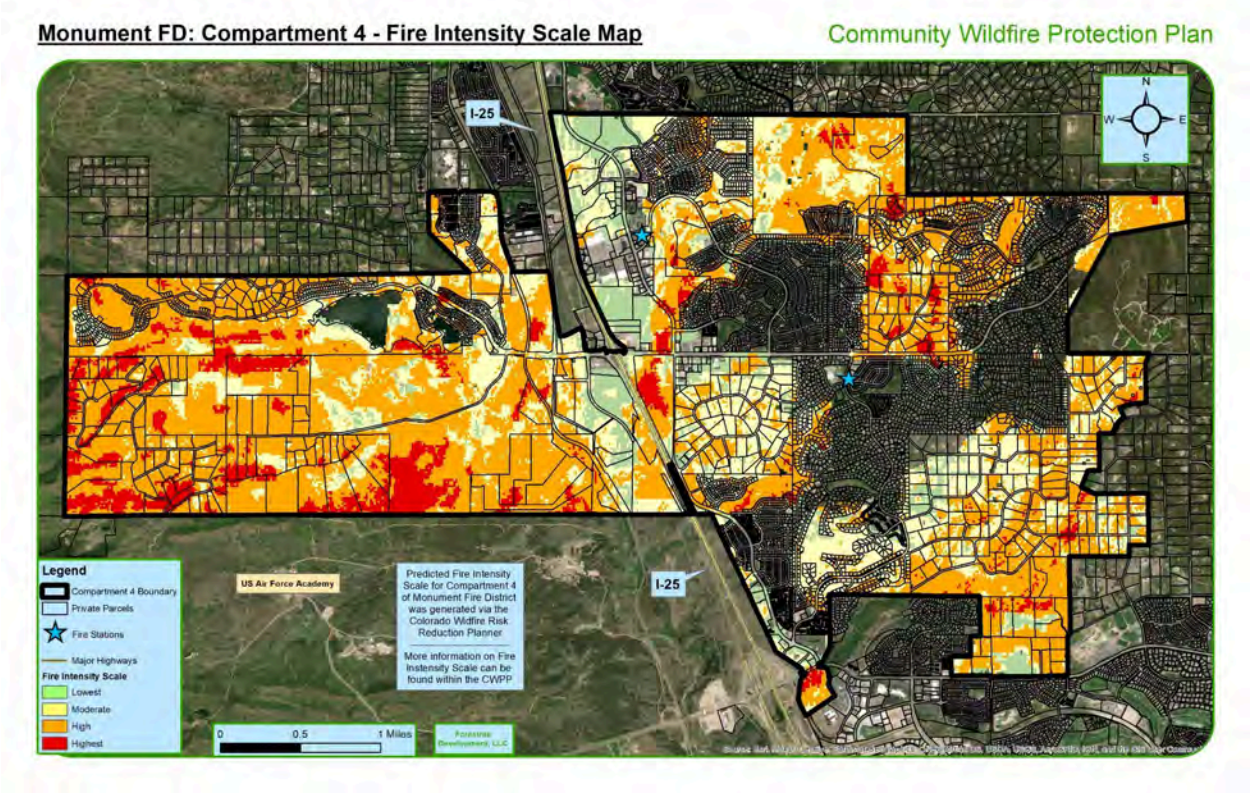


Monument FD: Compartment 4 - Fuel Model Map Community Wildfire Protection Plan

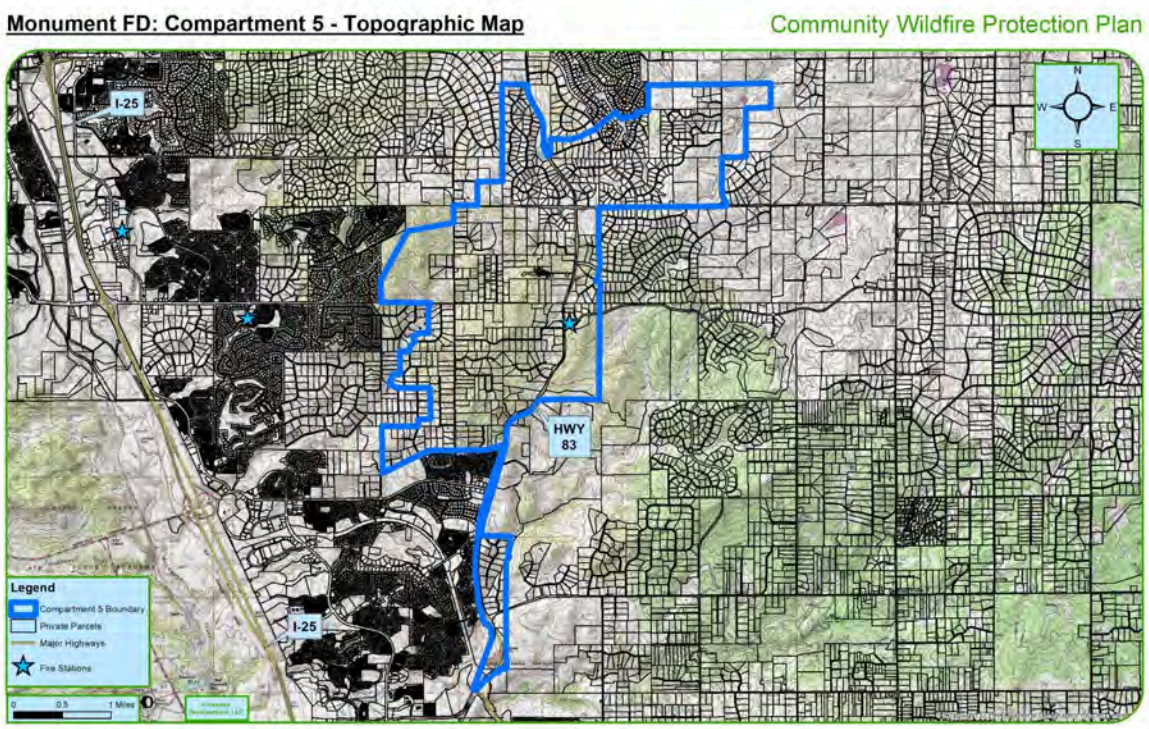


Monument FD: Compartment 4 - Rate of Wildfire Spread Map Community Wildfire Protection Plan

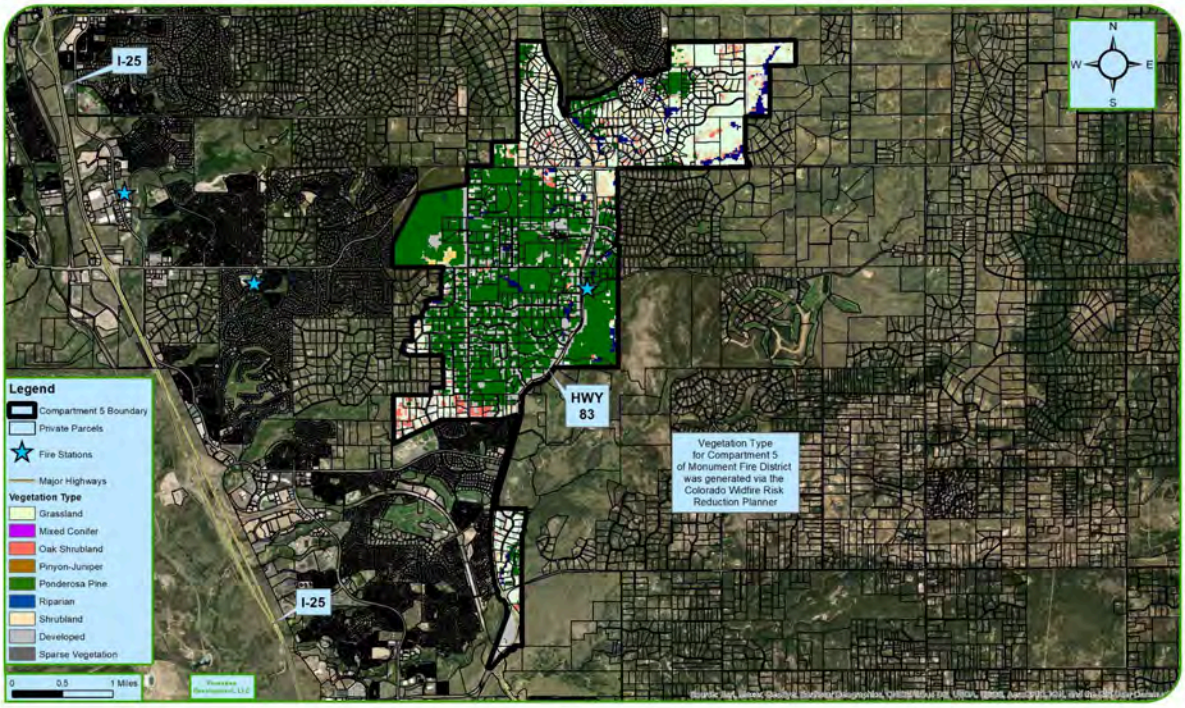




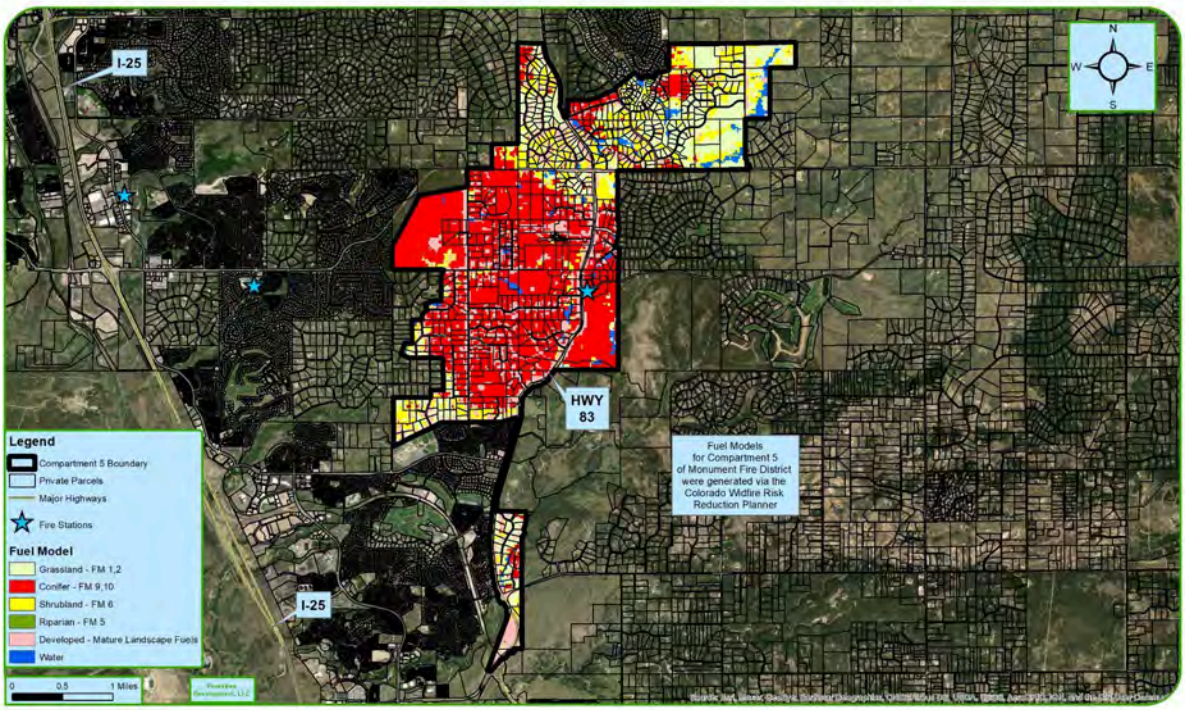
Compartment 5



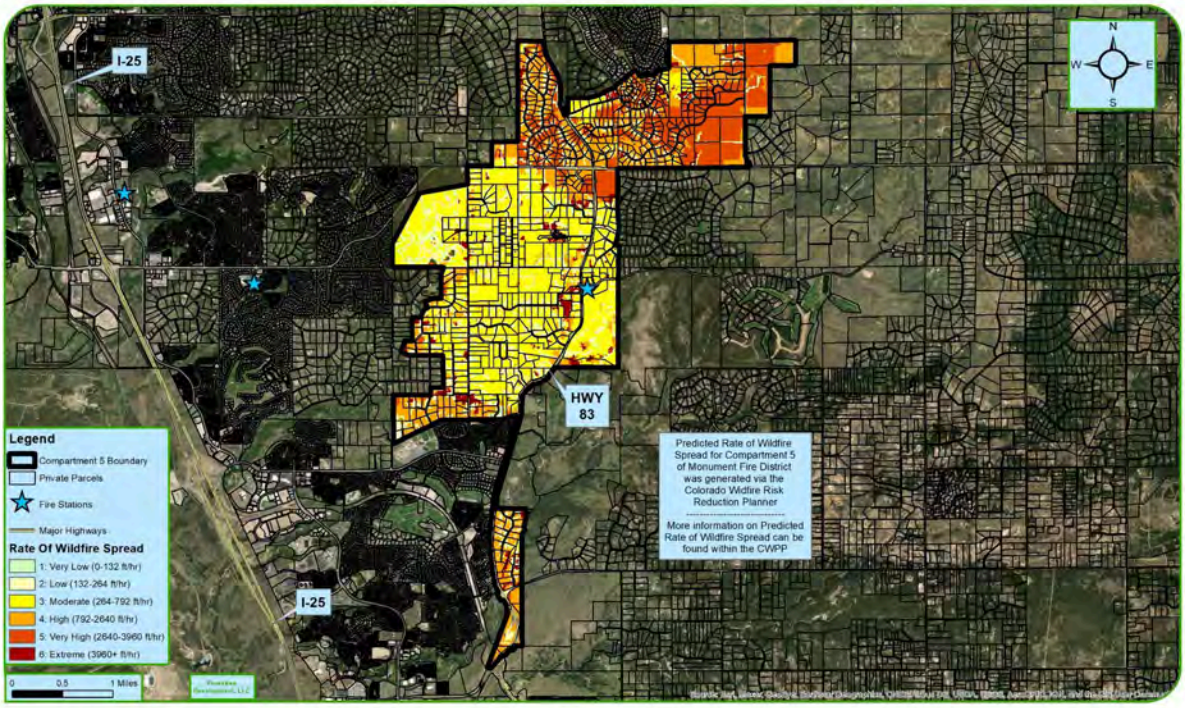
Monument FD: Compartment 5 - Vegetation Type Map Community Wildfire Protection Plan



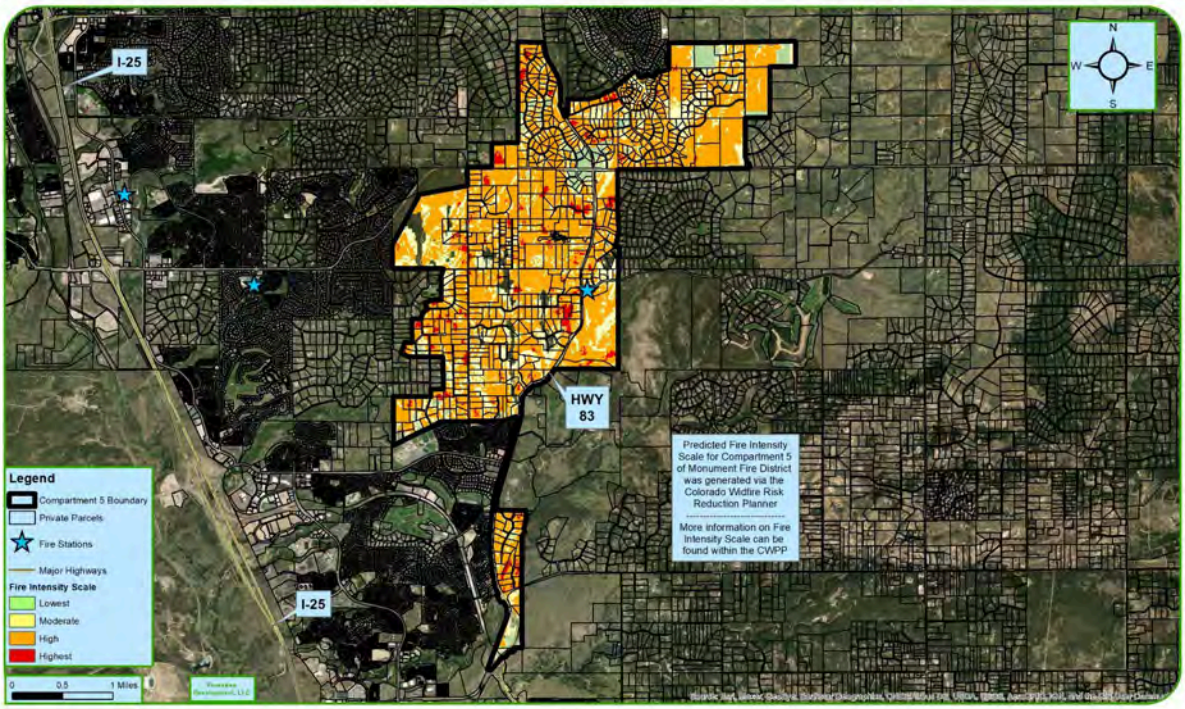
Monument FD: Compartment 5 - Fuel Model Map Community Wildfire Protection Plan



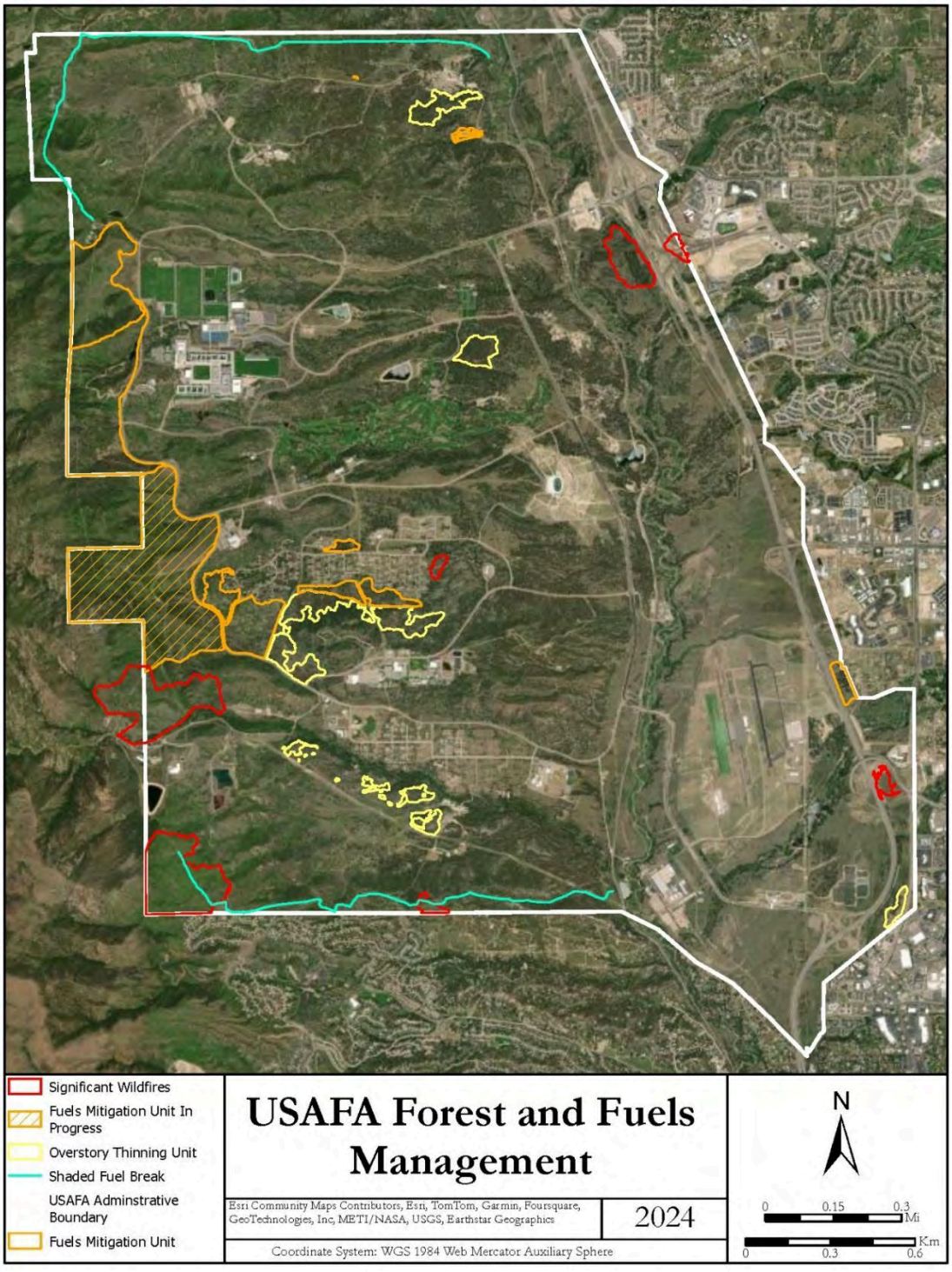
Monument FD: Compartment 5 - Rate of Wildfire Spread Map Community Wildfire Protection Plan



Monument FD: Compartment 5 - Fire Intensity Scale Map Community Wildfire Protection Plan



United States Air Force Academy Partnership Map



Appendix C:
Further Information

Websites:

Natural Resources Grants Database:
https://csfs.colostate.edu/natural-resources-grants-database/
Colorado State Forest Service:
http://www.csfs.colostate.edu/
Colorado State University Extension:
https://extension.colostate.edu
Pike National Forest:
http://www.fs.usda.gov/psicc
Bureau of Land Management, Royal Gorge Field Office:
https://www.blm.gov/office/royal-gorge-field-office
Natural Resources Conservation Service :
http://www.co.nrcs.usda.gov/

Publications:

***Best Management Practices to Protect Water Quality*:**
https://csfs.colostate.edu/wp-content/uploads/2024/01/BMP_WaterQuality_2023_Web_CMP.pdf
Wildfire Mitigation *CO Dept. of Revenue Tax Subtraction*:
https://tax.colorado.gov/sites/tax/files/documents/ITT_Wildfire_Mitigation_Measures_Feb_2024.pdf
Fuel Break Guidelines for Forested Communities:
https://static.colostate.edu/client-files/csfs/pdfs/fuelbreak_guidellines.pdf
Protecting Your Home from Wildfire: Creating Wildfire Defensible Zones:
https://csfs.colostate.edu/wildfire-mitigation/protect-your-home-property-from-wildfire/
Low Flammability Landscape Plants:
https://csfs.colostate.edu/wp-content/uploads/2023/05/CSFS_CSU-Ext_Fact-Sheets_LFLP_FINAL_web.pdf
Low Water Use and Fire-resistant Native Plant Materials for El Paso County:

https://elpaso.extension.colostate.edu/wp-content/uploads/sites/44/2022/09/Low-Water-Fire-Resistant-Plant-Materials-0712-2022-1.pdf
***Firewise Principles*:**
https://csfs.colostate.edu/wp-content/uploads/2016/09/MVFS-HIZ-Presentation.pdf
Grass Seed Mixtures to Reduce Wildfire Hazard:
http://csfs.colostate.edu/pdfs/06306.pdf
Colorado Property& Insurance Wildfire Preparedness Guide:
https://csfs.colostate.edu/wp-content/uploads/2023/05/Wildfire_22x8.5_2021.pdf
Forest Home Fire Safety:

https://csfs.colostate.edu/wp-content/uploads/2024/01/Forest-Home-Fire-Safety-Fact-Sheet-6.304.pdf

Forest Health and Management

Gambel Oak Management:

https://csfs.colostate.edu/wp-content/uploads/2024/01/Gambel-Oak-Management-Fact-Sheet-6.311.pdf

Forest Insect and Disease Information

Mistletoes in Colorado Conifers:

https://csfs.colostate.edu/wp-content/uploads/2024/01/Mistletoes-in-CO-Conifers-Fact-Sheet-2.925.pdf

Bark Beetles are Your Trees at Risk?:

https://static.colostate.edu/client-files/csfs/pdfs/Bark-Beetles-Brochure.pdf

Mountain Pine Beetle:

https://csfs.colostate.edu/wp-content/uploads/2024/01/Mountain-Pine

Ips Beetles:

https://csfs.colostate.edu/forest-management/common-forest-insects-diseases/ips-beetle/

Piñon Ips Bark Beetle:

https://csfs.colostate.edu/wp-content/uploads/2020/06/2020_Pinon_Ips_CSFS_Quick_Guide_Web.pdf

Western Spruce Budworm:

https://csfs.colostate.edu/wp-content/uploads/2014/02/Western_Spruce_Budworm_QG_10May2016.pdf

Emerald Ash Borer:

https://csfs.colostate.edu/wp-content/uploads/2016/04/FINAL_EAB_QuickGuide_Revision_25APRIL2016.pdf

Protecting Trees During Construction:

https://csfs.colostate.edu/wp-content/uploads/2024/01/Protecting-Trees-During-Construction-Fact-Sheet-7.420.pdf

Appendix D
Glossary of Forestry Terms

Abiotic Factors: The non-living components of the environment, such as air, rocks, soil, water, peat, and plant litter.

Afforestation: The establishment of trees on an area that has lacked forest cover for a very long time or has never been forested.

Aerial fuels: Standing and supported live and dead combustibles not in direct contact with the ground and consisting mainly of foliage, twigs, branches, stems, cones, bark, and vines: typically used in reference to the crowns of trees.

Cambium: A single layer of cells between the woody part of the tree and the bark. Division of these cells result in diameter growth of the tree through formation of wood cells (xylem) and inner bark (phloem).

Canopy: The forest cover of branches and foliage formed by tree crowns.

Chain: A measuring tape, often nylon, 50 meters or 75 meters in length, used to measure distances. This term is derived from an old unit of measurement (80 Chains = 1 mile).

Chimney: A topographical feature such as a narrow drainage on a hillside or the upper end of a box canyon that could channel wind, smoke or flames up the slope; acting as a fireplace chimney would to draw smoke and heat upward.

Class A Roof: Effective against severe fire test exposures, as classified by the Universal Building Code (UBC). Under such exposures, roof coverings of this class are not readily flammable, afford a fairly high degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brands.

Class B Roof: Effective against moderate fire test exposures, as classified by the Universal Building Code (UBC). Under such exposures, roof coverings of this class are not readily flammable, afford a moderate degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brands.

Class C Roof: Effective against light fire test exposure, as classified by the Universal Building Code (UBC). Under such exposures, roof coverings of this class are not readily flammable, afford a measurable degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brands.

Clearcut: An area of forest land from which all merchantable trees have recently been harvested.

Climax Forest: A forest community that represents the final stage of natural forest succession for its locality, i.e. for its environment.

Coarse Woody Debris (CWD): Sound and rotting logs and stumps that provide habitat for plants, animals, and insects, and a source of nutrients for soil development.

Colorado Champion Tree: The largest known tree of its species in the state. Trees are ranked by a point system based on three measurements: trunk circumference in inches at 4.5 feet above the ground, tree height in feet, and the average crown spread in feet.

Commercial Thinning: A silviculture treatment that "thins" out an overstocked stand by removing trees that are large enough to be sold as poles or fence posts. It is carried out to improve the health and growth rate of the remaining crop trees.

Competing Vegetation: Vegetation that seeks and uses the limited common resources (space, light, water, and nutrients) of a forest site needed by preferred trees for survival and growth.

Conifer: Cone-bearing trees having needles or scale-like leaves, usually evergreen, and producing wood known commercially as "softwoods."

Conservation: Management of the human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. It includes preservation, maintenance, sustainable utilization, restoration, and enhancement of the environment.

Crown fire / Crowning: A form of extreme wildland fire behavior consisting of fire that advances from top to top of trees or shrubs independent of a surface fire. Crown fires are sometimes classed as running or dependent to distinguish the degree of independence from the surface fire.

Deciduous: Perennial plants that are normally leafless for some time during the year.

Defensible Space: An area within the perimeter of a parcel, development, neighborhood, or community where basic wildland fire protection practices and measures are implemented, providing the key point of defense from an approaching wildfire or defense against encroaching wildfires or escaping structure fires. The perimeter as used herein is the area encompassing the parcel or parcels proposed for construction and/or development, excluding the physical structure itself. The area is characterized by the establishment and maintenance of emergency vehicle access, emergency water reserves, street names and building identification, and fuel modification measures. In simplest terms, it is adequate space between structures and flammable vegetation which allows firefighters a safe working area from which they can attack an oncoming wildfire. Defensible Space is the best element of fire protection for individual property owners.

Defoliator: An agent that damages trees by destroying leaves or needles.

Dripline: The outermost leaves on a tree define its dripline and the ground within the dripline is known as the drip zone; also defined as the area defined by the outermost circumference of a tree canopy.

Deforestation: The removal of a forest stand where the land is put to a non-forest use.

Eave Opening: A vent located in an eve or soffit which allows airflow into the attic and/or walls of a structure.

Ecosystem: A functional unit consisting of all the living organisms (plants, animals, microbes) in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size a log, pond, field, forest, or the earth's biosphere but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation; for example, forest ecosystem, old-growth ecosystem, or range ecosystem.

Escape route: A preplanned and understood route firefighters take to retreat from an unsafe or fire threatened area and move to a safety zone or other low-risk area**.**

Extreme fire behavior: A level of fire behavior that ordinarily precludes firefighting methods involving direct attack on the fire. One or more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

Felling: The cutting down of trees.

Firebrands: Flaming or glowing fuels lofted into the air during intense burning by strong upward convection currents. Also referred to as airborne embers.

Fire break: A natural or constructed fuel-free barrier used to stop or check fires that may occur, or to provide a control line from which to work.

Fire front / Flame front: The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified, the fire front is assumed to be the leading edge of the fire perimeter.

Fire Dependent: Requiring one or more fires of varying frequency, timing, severity, and size in order to achieve optimal conditions for population survival or growth.

Fire Hazard Mitigation: Various methods by which existing fire hazards can be reduced in a certain area, such as fuel breaks, non-combustible roofing, spark arresters, etc.

Fire Management: The activities concerned with the protection of people, property, and forest areas from wildfire and the use prescribed burning for the attainment of forest management and other land use objectives, all conducted in a manner that considers environmental, social, and economic criteria.

Fire Suppression: All activities concerned with controlling and extinguishing a fire following its detection.

Firewise: A National Fire Protection Association's (NFPA) program encouraging local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks.

Forest Fire: Any wildfire or prescribed burn that is burning in forest, grass, alpine, or tundra vegetation types.

Forest Type: A group of forested areas or stands of similar composition (species, age, height, and stocking) which differentiates it from other such groups.

Fuel: Any living or dead material that will burn.

Fuel break: An existing barrier or change in fuel type (to one that is less flammable than that surrounding it) or a wide strip of land on which the native vegetation has been modified or cleared, that acts as a buffer to fire spread so that fires burning into them can be more readily controlled. Often selected or constructed to protect a high value area from fire.

Fuel Management: The act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire in support of land management objectives.

Fuel Treatment Zone: An area similar to a fuel break but not necessarily linear, in which fuels have been reduced or modified to reduce the likelihood of ignition and/or to reduce fire intensity thereby lessening potential damage and resistance to control.

Germination: The development of a seedling from a seed.

Home Ignition Zone (HIZ): An area including the home and its immediate surroundings within which burning fuels could potentially ignite the structure; usually considered to be an area extending out roughly 100 feet from the home. The HIZ is often used to describe the area in which fuel modification measures should be taken to protect the home.

Ladder Fuels: Fuels that provide vertical continuity between the surface fuels and crown fuels in a forest stand, thus contributing to crown fires.

Lines of Effort: Tasks or sets of actions that are linked or coordinated with other task sets to accomplish a larger mission or reach a desired end state. Lines of effort allow leaders and decision makers to direct a variety of separate actions toward a unified result.

Maximum Density: The maximum allowable stand density above which stands must be spaced to a target density of well-spaced, acceptable stems to achieve free-growing status.

National Fire Protection Association (NFPA): A private, non-profit organization dedicated to reducing fire hazards and improving fire service.

Phloem: A layer of tree tissue just inside the bark that conducts food from the leaves to the stem and roots.

Pitch Tubes: A tubular mass of resin that forms on bark surface at bark-beetle entrance holes.

Prescribed Burning: Controlled application of fire to wildland fuels, in either their natural or modified state, under certain conditions of weather, fuel moisture, soil moisture, etc. as to allow the fire to be confined to a predetermined area and at the same time to produce results to meet planned land management objective.

Ready, Set, Go (RSG): A program, managed by the International Association of Fire Chiefs (IAFC), seeking to develop and improve the dialogue between fire departments and residents. The program helps fire departments teach individuals who live in high-risk wildfire areas how to best prepare themselves and their properties against fire threats.

Regeneration: The act of renewing tree cover by establishing young trees, naturally or artificially note regeneration usually maintains the same forest type and is done promptly after the previous stand or forest was removed.

Saddle: A depression, dip or pass in a ridgeline; significant in wildland firefighting because winds may be funneled through a saddle, causing an increase in wind speed.

Safety zone: An area essentially cleared of flammable materials, used by firefighters to escape unsafe or threatening fire conditions. Safety zones are greatly enlarged areas in which firefighters can distance themselves from threatening fire behavior without having to take extraordinary measures to shield themselves from fire/heat.

Sapwood: The light-colored wood that appears on the outer portion of a cross-section of a tree.

Serotinous: Pertaining to fruit or cones that remain on a tree without opening for one or more years, note in some species cones open and seeds are shed when heat is provided by fires or hot and dry conditions.

Shaded fuel break: A fuel break built in a timbered area where the trees within the break are thinned and limbed up to reduce crown fire potential, yet retain enough crown canopy to provide shade, thereby making a less favorable microclimate for surface fires.

Silviculture: The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Stand: A continuous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.

Spot Fire / Spotting: Fires ignited beyond control lines or outside the perimeter of a fire by firebrands landing on/among flammable material. Spot fires/spotting are a form of extreme fire behavior typically resulting from high wind conditions.

Structure protection: A defensive strategy in wildland firefighting in which firefighters are assigned to evaluate, prepare and, when possible, defend structures/homes that may be threatened by a wildfire.

Structure triage: Evaluating and sorting structures/homes into categories based on their relative likelihood of surviving a wildland fire threat (*defensibility*). Triage decisions are based multiple factors and conditions occurring during an actual fire - weather, fire behavior, home ignition potential, defensible space, presence of escape routes, and availability of firefighting resources, among others - with the goal of doing the most good with the resources available.

Succession (or Ecological Succession): The replacement of one plant and/or animal species over time by another in progressive development toward climax vegetation.

Surface fuels: Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low-lying live vegetation.

Survivable space: A term typically used to describe the area around a structure/home indicating that fuels in the area have been reduced to the point that there is little or no serious fire threat to the structure; the structure has a high probability of surviving a wildland fire without anyone on scene providing active protection.

Thinning: A cutting made in an immature crop or stand primarily to accelerate diameter increment, but also, by suitable selection, to improve the average form of the tree that remain.

Torching: The burning of the foliage of a single tree or a small group of trees, from the bottom up. Sometimes, also called candling. Torching is an extreme form of fire behavior, similar to but less extreme than crowning in that crowning affects larger numbers, even entire stands of trees.

USDAFS: United States Department of Agriculture - Forest Service, what is commonly known as just "The Forest Service"

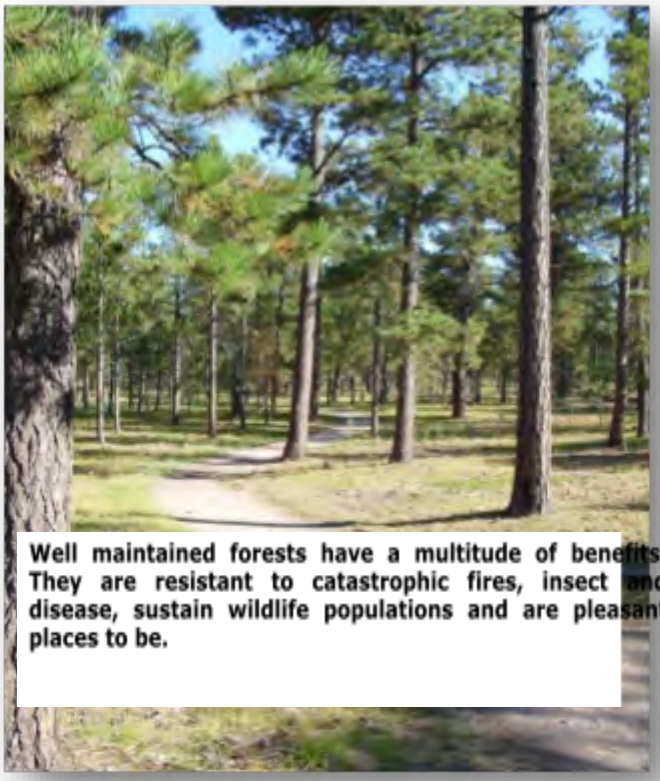
Windbreak: A strip of trees or shrubs maintained mainly to alter wind flow and microclimates in the sheltered zone, usually farm buildings.

Wildland-Urban Interface or Wildland-Urban Intermix (WUI): The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Although ***Interface*** is the more general, more commonly used term; it technically refers specifically to the area where development and

wildlands meet. ***Intermix*** indicates the presence of wildland vegetation/fuels intermingled throughout the developed area.

Appendix E:
INSECT AND DISEASE INFORMATION

Literally thousands of insects and diseases are present in the forests surrounding Manitou Springs or any other forested area. Fortunately, like the common cold, most do no serious or lasting damage. But when in poor health, trees, like humans, are more prone to infection from other causes; the concept of preventive medicine applies to forests, as well as to humans. Maintaining forests in good health will prevent problems in the future. For the most part, forest insect and disease issues are typical for the region.



Every summer, insect and disease specialists from the USDA Forest Service and Colorado State Forest Service (CSFS) survey Colorado's forests from the air to monitor insect and disease outbreaks. These flights are an excellent means of finding new areas of insect and disease activity and monitoring trends in existing outbreaks. Maps of the previous year's findings are published in January and can be found on the CSFS website at

http://csfs.colostate.edu/pages/common-insects.html.

This link also contains more detailed information on the insect and disease issues presented here.

The unnaturally dense forest conditions that cause the potential for hazardous fire also create the potential for cyclical insect and disease outbreaks. Trees weakened by overcrowding and severe competition for water and sunlight are susceptible to invasion by insects and disease. When planning wildfire hazard mitigation projects, it is important to address current insect or disease issues and prevent those that are likely to become a problem. Following is information on some of the common forest insect and disease problems that have been identified in the region.

DWARF MISTLETOE

Dwarf mistletoe is a parasitic plant that robs moisture and nutrients from the host tree. Over many years, it causes the tree to decline in vigor and eventually may cause death. More commonly, the tree declines to the point where bark beetles attack and kill it.

A ponderosa pine with advanced dwarf mistletoe infection. Note the heavy contorted "witches' brooms" in the lower branches. After long periods of infection, the needles become sparse and shorter.

Three common species of dwarf mistletoe are found in the region, each named after its principle host – ponderosa pine, lodgepole pine and Douglas-fir. Locally, ponderosa and lodgepole varieties grow on any pine species, but Douglas-fir dwarf mistletoe is exclusive to Douglas-fir trees. Spruce, true firs and deciduous trees are immune to all three species of dwarf mistletoe.

The most obvious symptom of dwarf mistletoe infection is the dense, distorted growth of the branches, called witch's brooms because they appear to be twisted or tied in knots. The shoots of ponderosa dwarf mistletoe are visible on the branch as thick fingerlike growths extending out of the branch or trunk.

Mistletoe shoots are only reproductive structures with no photosynthetic function. Removing the shoots from a branch does not control dwarf mistletoe, except to temporarily halt seed production. Structures called sinkers, (analogous to roots in plants) embedded in the wood cause the damage, and the mistletoe plant continues to absorb the host tree's water and nutrients. Shoots that are removed grow back in two or three years.

During the growing season, dwarf mistletoe shoots develop berries containing a seed. In August, the berries fill with water and explode, shooting the seed as far as 40 feet. Most seeds strike branches of the host tree and do not travel the full 40 feet, so the expansion of dwarf mistletoe pockets averages two feet per year.

When the seed strikes a branch, it germinates, and the sinkers penetrate the bark into the tree's conductive tissues. The growing mistletoe begins to steal the tree's food and water. The first visible symptom of infection is swelling in the branch at the site of the growing mistletoe plant, but nubs of the emerging shoots won't be visible for three years and a shoot won't bear its first seeds until seven

years after. As seeds spread, all susceptible trees in the vicinity may become infected; it is extremely rare to find an isolated infected tree in the forest.

The tendency of mistletoe to infect all trees in a stand makes eradication difficult. No effective chemical treatment exists for mistletoe, and the only way to kill the parasite is to kill the host. In stands where only the susceptible species of tree exists, total eradication of the mistletoe would require a clearcut, which is unacceptable to most landowners.

Fortunately, mistletoe kills trees slowly, so it is not necessary to eradicate the parasite. The disease can be controlled by a program of thinning to increase tree vigor. Pruning the more heavily infected branches also helps, even if not all the mistletoe is eliminated. The final step in the process is to replant with non-susceptible species so that new trees will grow before the mistletoe kills the remaining trees.

The spread of mistletoe can be halted by a minimum 40-foot buffer zone between infected and non-infected trees. In this situation, cut 20 feet into non-infected trees to remove any mistletoe that is not yet visible; cut the remaining 20 feet into the infected stand. Non- infected trees outside the buffer should be checked each spring for mistletoe and any infected branches should be immediately pruned before seeds develop.

In forest stands with mixed tree species, it may be possible to eliminate all mistletoe by retaining only non-susceptible trees if they are in good health.

Dwarf mistletoe treatment is a complicated process that depends on the site conditions and the landowner's tolerance for cutting trees. In most cases, a combination of treatment methods will best suit the landowner's objectives. Consultation with a qualified forester is recommended to develop an effective and acceptable treatment plan.

MOUNTAIN PINE BEETLE

Mountain pine beetles are at endemic levels in the Black Forest. Most beetle activity is in stands with heavy infections of dwarf mistletoe that are weak and vulnerable to beetle attack. Beetles are also active in the burn scar where the fire weakened but did not kill the trees outright. Elsewhere in the forest, beetles kill isolated trees here and there.

Adult beetles fly and attack new trees from midsummer through the first frost. Females seek a large, weak tree in which to mate and lay eggs. Vigorous trees generate enough pitch to prevent the female from burrowing through the bark, and this attempt by the tree to prevent entry creates the pitch tubes symptomatic of beetle attack. Pitch tubes are **not** a particularly reliable indicator of a successful attack. If pitch tubes are seen, check for reddish boring dust (fine sawdust) at the base of the tree and in the bark crevices. Boring dust is a more reliable indicator of successful attack.

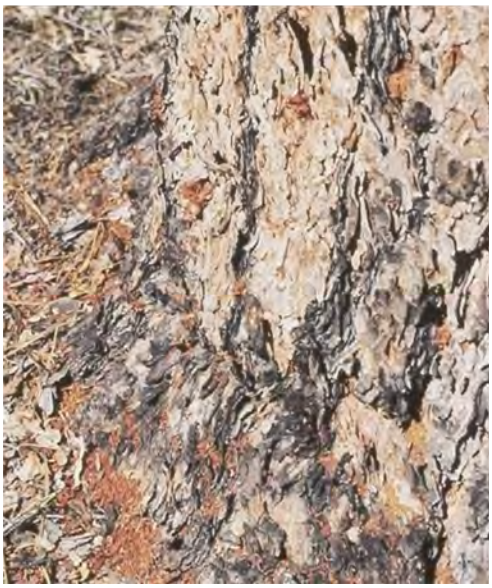
Once a female penetrates the bark, she hollows out a circular mating chamber between the bark and the wood, releasing a pheromone (scent) to attract a mate. The pheromone also attracts additional females to the tree and the tree is attacked in mass. After mating, the female burrows up the trunk between the bark and wood laying eggs. She inoculates the tree with spores of bluestain fungus, which provides food for the larvae. The fungus clogs the tissues that conduct water throughout the tree, leading to death within a few weeks.

Eggs hatch within a few days. The developing larvae feed horizontally from the maternal gallery over winter. The vertical maternal gallery and horizontal larval galleries are characteristic of the mountain pine beetle. The feeding larvae spread the bluestain fungus horizontally through the tree, and it becomes visible in the wood around February. The presence of bluestain is

absolute confirmation that beetles have successfully entered the tree. Woodpeckers feed on the larvae through the fall and winter. The holes made by woodpeckers are a visual clue to an infested tree. Untrained observers often are confused by the holes woodpeckers make when they feed on beetle larvae and sapsuckers feed on the sap. Woodpecker feeding is characterized by random holes about one-half inch in diameter that make it appear as though the tree was peppered with a shotgun. Sapsuckers, on the other hand, make a small hole about one-eighth inch in diameter, and the holes are in straight lines or a grid pattern. Sapsuckers do not indicate the presence of beetles in the tree.

Although the tree is dead within a few weeks of successful attack, needles remain green until the following spring. Within the space of a few weeks, in late May or early June the tree will turn straw yellow and then reddish-brown. Once beetles invade a tree, nothing can be done to save it; the tree must be cut and disposed of in a way that will kill the beetles. No insecticide is available to kill beetles under the bark; thus, some sort of mechanical treatment is necessary. Any wood greater than four inches in diameter may harbor beetles and must be treated.

The following are treatment options for beetle-infested trees:



Boring dust on a ponderosa pine after bark beetle attack. The reddish-brown sawdust at the base of the tree and in the bark crevasses is a strong indication of successful beetle attack. *Colorado State Forest Service photo by David Leatherman*

Mountain pine beetle galleries under the bark of a ponderosa. The maternal beetle burrowed up the tree creating the central gallery. Larvae feed horizontally creating the side galleries A larvae is in the upper right and a pupa is in the lower left. Note the blue stain in the wood.

- The sawmill on the property is an effective treatment for any bark beetle (MPB or Douglas-fir beetle). Larval beetles are between the bark and the wood. When the trees are squared in the mill, the slabs dry and the beetles perish.
- Move all wood to a landfill or bury it under at least eight inches of dirt.
- Completely debark any wood that is larger than four inches in diameter.
- Chip or masticate the tree. Many tree services have chippers capable of chipping large diameter trees. The beetles are killed when the wood is chipped.
- Cover wood with at least six-mill clear plastic. This method, known as solar treatment, warms the wood to temperatures Lethal to the larvae, and increases moisture, encouraging mold growth in the logs, which kills the beetles. Treat the wood properly for successful control. Cut into firewood lengths and stack no more than two logs high. Be sure there are no exposed stubs or sharp edges that might tear the plastic. Trench around the pile and, if possible, wet down the pile to encourage mold growth. Cover the pile with plastic, push the edges of the plastic into the trenches, and seal the edges with dirt. Check periodically to be sure the plastic has not torn. If torn, it can be repaired with duct tape.

It is best to check for infested trees in October of each year – remember that infested trees, although dead, are still green at this time. Pitch tubes and boring dust will be the most obvious clues. If infested trees are located early, there is adequate time to treat them.

While no insecticide effectively treats infested trees, spraying with insecticides such as carbaryl or permethrine prevents attack. Preventive sprays will not kill beetles under the bark. Spray trees between May 1st and July 1st each year for maximum effectiveness. It is not practical to spray every tree on a large tract of land, so choosing which trees to spray depends on the landowner's budget and the value of individual trees to the landowner. It is advisable to solicit bids from several different spray companies, as prices can vary widely. It also is wise to request and check references.

Preventative spraying should be done only if there is a serious threat from infested trees within a mile or less of the property. Preventative sprays kill predators of aphids. These predators keep aphids at low levels and trees can easily tolerate their feeding. Frequent preventative spraying allows aphid populations to increase to concentrations where they may do serious injury or kill a tree outright.

Thinning forests for increased health and vigor by far is the best preventive measure for mountain pine beetles. Because trees require several years to respond to thinning, it is best done before beetles reach epidemic levels. Follow thinning guidelines for wildfire mitigation to reduce susceptibility to MPB.

IPS (ENGRAVER) BEETLES

There are several species of these small bark beetles that may infest ponderosa pine piñon pine or spruce. Piñon ips is active along the Highway 115 corridor south of Colorado Springs. The

other species are always present in the forest but are not currently at epidemic levels. Ips beetles usually attack trees less than four inches in diameter and, in such circumstances, may be useful in thinning dense stands of young trees. Thus, it usually is not considered as threatening mountain pine beetle. Ips will attack larger trees if they are severely weakened by disease (most often dwarf mistletoe), or are damaged by construction, lightning strikes or in horse corrals where soil compaction injures the roots. Like the mountain pine beetle, ips burrow beneath the bark and inoculate the tree with bluestain fungus, and they often follow mountain pine beetles into larger trees.

Red boring dust on ponderosa pine slash indicates it has been invaded by ips beetles. Adult beetles will emerge in eight weeks if the slash is not properly treated.

The differences between mountain pine beetle and ips are significant to anyone implementing a forest management program. Ips become active in spring when the weather exceeds 50 degrees F, developing from egg to adult within eight weeks, and they continue to attack trees until the first frost. For this reason, preventive spraying should be done with permethrine or carbaryl in April and repeated in July. When spraying preventively for ips, it is important to spray the branches, as well as the trunk.

Ips attack causes no pitch tubes to form on live trees, so the only visual clue is boring dust or woodpecker holes in the trunk. Smaller trees quickly turn reddish-brown, but when they attack larger trees, ips often infest only the upper portion of the tree. The first symptom is browning of the top, but subsequent generations emerge and continue down the tree.

Ips will infest green slash and downed logs from forest management projects. If slash is not promptly treated, ips will emerge to attack living trees; treat slash within four to six weeks after cutting. If weather conditions permit, thinning trees in winter when ips are dormant will prevent problems with beetles in slash. However, slash cut after March 1 may still be green enough to attract ips when the weather warms.

Chipping slash will kill ips beetles. Lopping and scattering slash into lengths less than 24 inches promotes rapid drying and prevents infestation. Untreated slash left over the winter will produce live broods the following April. Due to their short lifecycle, solar treatment of ips-infested logs is ineffective. Bucking larger diameter logs and promptly splitting them into firewood accelerates the drying process and usually is effective in preventing ips infestations.

Many high value trees have been lost as a result of the common, and ultimately costly, practice of stacking firewood against green trees. Ips beetles will burrow out of infested firewood directly into standing trees.

DOUGLAS-FIR BEETLE

During the forest inventory, no Douglas-fir beetle infested trees were observed on the property, but the potential of attack is present. Some similarities exist between Douglas-fir beetle and MPB, but there are important differences that require different treatment strategies for infested trees.

Both species burrow under the bark to lay eggs and both carry blue stain fungus that kills the tree within a few weeks of infestation. Each beetle prefers dense stands with large diameter, low vigor trees; thus, thinning Douglas-fir for wildfire mitigation also reduces susceptibility to beetles.

Adult Douglas-fir beetles emerge in mid-June, and a few adults may overwinter in trees and emerge as early as April. There are no insecticides available for treatment of beetle infested trees. Infested trees should be treated prior to April of each year to prevent emergence of overwintering adults. Other effective treatments are whole tree chipping, debarking of all wood greater than four inches in diameter, transportation to a safe site or landfill, and burying under eight inches of dirt. Solar treatments should begin in the fall, preferably early fall.

Preventative spraying is an option for high value trees. Permethrin or carbaryl are effective as Douglas-fir beetle preventatives, but, because of the earlier emergence of overwintering adults, spraying should be done in April. Preventative sprays are not an effective treatment for infested wood.

Unlike MPB-infested trees, Douglas-fir trees do not form pitch tubes when attacked, so there may not be an obvious visual indication of infestation. Some Douglas-fir bleed sap when attacked, resulting in rivulets of sap on the trunk; however, this does not occur in all infested trees. Trees should be checked carefully for boring dust in early October. Later in the year, woodpecker holes may provide a visual clue that trees are infested.

Trees partially defoliated by western spruce budworm (see the following section) are particularly susceptible to attack by Douglas-fir beetles. Injury, overcrowding or any conditions that adversely affect the vigor of the tree will make it more susceptible. Managing the forest for open, vigorous stands of Douglas-fir is the best prevention.

References

Cranshaw, Whitney, David Leatherman, Boris Kondratieff, Paul Opler, and Casey Sclar. Nd. *Insects and Diseases of Woody Plants of the Central Rockies.* Bulletin 506A, Colorado State University Cooperative Extension.

Furniss, R.L., and Carolin, V.M. (1977). *Western Forest Insects.* Miscellaneous Publication No. 1339 USDS Forest Service.

Johnson, Warren T., and Lyon, Howard H. 1991. *Insects that Feed on Trees and Shrubs.* Comstock Publishing Associates, Cornell University Press.