



TECHNICAL MEMORANDUM

DATE: January 26, 2026

TO: William Guman and Associates, Ltd

FROM: Ecosystem Services, LLC

RE: Welsch-Howells Subdivision Wildland Fire, Hazard Mitigation & Forest Management Plan

1.0 Introduction

Ecosystem Services, LLC (ECOS) was retained by William Guman and Associates (Guman) on behalf of Randy Welsh (Landowner) to prepare a Wildland Fire & Hazard Mitigation Plan and Forest Management Plan for the approximate 5-acre Welsch-Howells Subdivision site (Site and Project).

1.1 Purpose

According to the El Paso County (EPC) Land Development Code (LDC) 20-001 for Fire Protection and Wildfire Mitigation (Code) (EPC, 2021), the stated general purpose and intent of the Code for Fire Protection and Wildfire Mitigation is *to ensure that proposed development is reviewed in consideration of the wildfire risks and need to provide adequate fire protection in order to:*

- a. *Regulate development, buildings and structures so as to minimize the hazard to public health, safety and welfare;*
- b. *Ensure that adequate fire protection is available for new development;*
- c. *Implement wildfire hazard reduction in new development;*
- d. *Encourage voluntary efforts to reduce wildfire hazards; and*
- e. *Reduce the demands from the public for relief and protection of structures and facilities.*

Refer to Appendix A, El Paso County Fire Protection and Wildfire Mitigation Code.

This Wildland Fire and Hazard Mitigation Plan (Plan) plan does not include:

- Reports and Commitments for Subdivisions (Section B of the Code);
- Design Standards related to the regulation of development, buildings and structures, including water supply, roads, non-road access and gates (Section C of the Code); or
- General Construction in Wildland Fire Areas [Section (D)(1) or (D)(2)(b) of the Code].

These items shall be considered and provided by Applicant and their site planners, engineers, architects and/or home builders under separate cover.

This Plan is provided as a general plan, without analysis, to provide data and resources to meet purpose and intent of the Code, including a:

- Wildland Fire and Hazard Mitigation Plan [Section (D)(2)(a) of the Code];
- Wildland Fire Risk and Hazard Severity Analysis [Section (D)(3) of the Code]; and
- Defensible Space Requirements (Section D5 of the Code)

Higher level plans developed by a fire ecologist or specialist may be required at a later stage in the development process to satisfy all portions of the Code including:

- Reports and Commitments for Subdivisions (Section B of the Code);
- Design Standards related to the regulation of development, buildings and structures, including water supply, roads, non-road access and gates (Section C of the Code); or
- General Construction in Wildland Fire Areas [Section (D)(1) or (D)(2)(b) of the Code].
- No Permit or Approval Granted without Compliance (Section D4 of the Code); or
- Fuels Modification During Development and After Construction (Section D6 of the Code); or
- Combustible Materials (Section D7 of the Code).

This Plan relies on publicly available State and County wildfire references to assist the Applicant and future home owners with meeting the EPC requirements. These references include:

- Colorado State Forest Service (CSFS) Wildfire Risk data;
- CSFS Home and Property Protection data;
- El Paso County (EPC) Office of Emergency Management Wildfire Mitigation and Defensible Space data; and
- EPC Sheriff's Office Community Wildfire Protection Plan for Unincorporated El Paso County;

1.2 Project Description and Site Location

The property is currently unplatted, and the Applicant is seeking approval of a Zoning Change from RR-5 to RR-2.5 to create a subdivision. Upon approval of the Zoning Change, the Project will contain two single-family, residential lots, both of which will be 2.5 acres in size. One lot will include an existing residence (11525 Howell Road), so there will only be one new home. Please refer to Figure 1, Site Plan provided by the Applicant (dated January 21, 2026) and the development application for specific details and descriptions of the Project.

The Site is located in the southwest portion of the Black Forest, due east of northern Colorado Springs in El Paso County, Colorado. It is situated south of Kettle Creek, east of Howells Road, west of Milam Road and north of Mountain View Drive. It is adjacent to west side of Canyon Creek Ranch. The Site is specifically located within the South 1/2 of the Southwest 1/4 of Section 14, Township 12 South, Range 66 West of the 6th P.M., El Paso County, Colorado (El Paso County Parcel 6214000112). The center of the Site is located at approximately Latitude 38.998754° north, Longitude -104.752782° west at an elevation of approximately 7,000 feet above mean sea level. Refer to Figure 2, USGS Site Location Map and Figure 3, Existing Conditions Aerial Photo.

1.3 Site Access and Evacuation

Existing Lot 1 (11525 Howell Road) of the proposed development can be accessed or evacuated via the existing driveway that heads west to Howells Road. Lot 2 of the proposed development can be accessed or evacuated via the existing driveway through Lot 1 to the existing home on Lot 1.

2.0 Environmental Setting

The Site is located in the UESPA Level III Ecoregion: 26 Southwestern Tablelands Ecological Region (Chapman et al, 2006). More specifically, the Site is located within the Pine-Oak Woodlands (26i), Level IV Ecoregion. The Pine-Oak Woodlands ecoregion is a dissected plain with dense oakbrush and deciduous oak woodlands combined with ponderosa pine woodlands. The southern portion is

known locally as the Black Forest. Although woodlands dominate, the region is a mosaic of woodlands and grasslands. It is somewhat more dissected than the surrounding Foothill Grasslands (26j) ecoregion. The Pine-Oak Woodlands may be an outlier of the ponderosa pine woodlands found in the mid-elevation forests of the Southern Rockies (21) to the west. Soils are formed from weathered sandstone and shale with some outwash on uplands. Land use is woodland, wildlife habitat, and some rangeland. Areas of the region are rapidly urbanizing.

2.1 Topography

The topography of the Site is relatively level, ranging from 6,980 to 7,000 feet above mean sea level (AMSL). However, the elevations in the east/northeast portion of the Site drop off significantly to the northeast toward a deep, offsite ravine that drains to Kettle Creek. Refer to Figure 2, USGS Site Location Map and Figure 11, Slope Map.

2.2 Drainage Basin and Drainages

The Site is located within the Fountain Creek sub-watershed of the Arkansas River Watershed. Kettle Creek includes FEMA mapped floodplains. Overland drainage from precipitation generally flows north/northeast toward the offsite ravine that drains to Kettle Creek, an intermittent stream that flows into Monument Creek, then Fountain Creek, and then into the Arkansas River.

2.3 Weather

Weather is a large component that drives wildfires and efforts to contain them. Wind and moisture are the two major weather phenomena that always affect wildfire behavior. Lack of moisture, either as rain or snow, allows vegetation to dry out and become much more susceptible to ignition. The lighter the fuel, the quicker the lack of moisture renders it more hazardous. Grasses become dry in just days. Brush or small trees can become hazardous in weeks and significant stands of pines can become dangerously dry in not much more than a month. The effect is cumulative. A prolonged period without significant moisture lowers the moisture content of all of the vegetation at the same time raising the chance of uncontrollable wildfire. Conversely, rain or snow during a wildfire will suppress it and may even extinguish it.

Strong wind will drive wildfire before it and increase the speed at which the fire travels. Wind will also loft embers or fire brands high into the air where the directional winds will transport them, still glowing, well beyond the limits of the fire. This is called spotting and it can and often does, start new fires up to a mile or more away. Additionally, extreme fire behavior will create its own winds. These winds sometimes appear within the fire as small tornadoes.

Wildfires start, grow and damage property in every month of the year here. We (Colorado) have experienced prolonged periods of hot and dry conditions that we recognize as droughts on a more frequent basis over the recent past. We will likely continue that in the future as well. While we can't do anything about the weather, we can and must be mindful of its effects and potential impact on the fire possibility as well as fire behavior all year long (Hannigan, 2024).

The following weather trends are provided for better understanding of this component of wildfire hazards and mitigation in the Black Forest (WEATHER SPARK, 2025).

Temperature trends

- Warming trend: Temperatures in Colorado have risen significantly over the last 30 to 50 years, and future projections estimate increases of 2.5°F to 5.5°F by 2050.
- Seasonal averages:

- o Summer: Black Forest experiences hot, dry summers. The hottest day is typically July 10, with an average high of 79°F. July is the warmest month.
 - o Winter: January is generally the coldest month across Colorado, with Black Forest experiencing its lowest average temperatures around December 30, with lows around 16°F.
- Extended warm season: Longer-range forecasts predict hotter, drier summers and above-normal temperatures in the fall for the Black Forest area.

Precipitation trends

- Rainfall:
 - o Average annual rainfall is 15-16 inches, with the greatest precipitation occurring between May and September.
 - o Rainfall is most common during the summer months (May to September). The highest chance of a "wet day" is in August, with an average of 36% and a monthly rainfall average of 1.8 inches.
 - o Long-range outlooks predict below-normal precipitation for the area in the fall.
- Snowfall:
 - o Despite the region's overall warming trend, Black Forest still receives snowfall during the colder months, primarily from October to May with average monthly highs of 2.8 inches in November and 5.8 inches in April.
 - o Recent long-range predictions for the northern part of the region, where Black Forest is located, suggest near-normal snowfall for the winter.

Wind and growing season

- Winds: Wind speed changes throughout the year with average hourly speeds being higher in the winter and early spring (10.8 mph) with average highs and lows of 19 and 4 mpg. Wind speed is calmer in the summer and early fall (7.2 mph) with average highs and lows of 12 and 3 mpg. Gusts between 60 and 80 mph occur occasionally along the Front Range. Wind speeds were reported at 20 to 35 mph with gust reaching over 50 mph during the Silver Charm Fire in nearby Colorado Springs in April 2022.
- Growing season: The growing season in Black Forest typically runs from mid-May to late September, a period of about 135 days.

Overall climate factors

- Arid conditions: Colorado generally experiences arid conditions, with low annual precipitation and over 300 days of sunshine per year.
- Elevation: Black Forest's higher elevation compared to nearby Colorado Springs contributes to lower average temperatures and more snowfall.
- Climate change impacts: Rising temperatures across Colorado are leading to shifts in snowmelt runoff, affecting water availability, and increasing the risk of extreme weather events.

Climate trends in Black Forest, Colorado, show warmer temperatures, reduced snowfall, and a longer summer season, consistent with broader statewide patterns. The area experiences significant seasonal temperature shifts, with hot, sunny summers and cold, snowy winters (CWCB, 2025).

2.4 Vegetation (Fuels)

The majority of the Site is vegetated with ponderosa pine (*Pinus ponderosa*) with few shrubs in the understory. Herbaceous vegetation is sparse in the pine forested areas due to a thick layer of pine duff. A thinned ponderosa pine area in the northwest portion of the Site surrounding the existing home on Lot 1 has an understory of grassland with little pine duff as a result of sunlight penetration to the ground surface.

CSFS vegetation mapping data from which all CSFS wildfire data is coarse. ECOS developed a more detailed Vegetation Map that illustrates the following vegetation cover of the Site:

- Ponderosa Pine Forest = 50%;
- Grassland – Ponderosa Pine Forest = 30%
- Landscape and Managed Areas = 20%

Refer to Figure 3, Existing Condition Aerial Photo and Figure 4, Vegetation Map.

An on-site assessment of vegetation cover as follows shows similar vegetation coverage:

2.4.1 Ponderosa Pine Forest

Approximately 2.72 acres (50%) of the Site is dominated by ponderosa pine (*Pinus ponderosa*) forest underlain by a thick layer of pine needle duff with occasional patches or individual kinnikinnick (*Arctostaphylos uva-ursi*), squaw current (*Ribes cereum*), Wood's rose (*Rosa woodsii*), snowberry (*Symphoricarpos* spp.), and mountain mahogany (*Cercocarpus montanus*) in the understory. Forest openings where sunlight penetrates the forest canopy that have less pine needle duff include occasional patches of chokecherry (*Prunus virginiana*), mountain mahogany and/or grasses and wildflowers. Grasses and wildflowers include: brome (*Bromus inermis*), blue grama (*Bouteloua gracilis*), western wheatgrass (*Agropyron smithii*), side-oats grama (*Bouteloua curtipendula*), needle-and-thread (*Stipa comata*), little bluestem (*Andropogon scoparium*), mountain muhly (*Muhlenbergia montana*), fringed sage (*Artemisia frigida*), golden bean (*Thermopsis rhombifolia*) and yucca (*Yucca glauca*).

2.4.2 Grassland-Ponderosa Pine Forest

Approximately 1.28 acres (30%) of the Site consists of grassland (species listed above) with an overstory of ponderosa pine. Ponderosa pine in this area has been thinned and managed by the existing home owner allowing more sunlight and grasses to grow, including a small patch of pine saplings.

2.4.3 Landscape and Managed Areas Areas

The existing home is situated in the southwestern portion of the Site. Landscape and Managed Areas adjacent to the home make up approximately 1.00 acre (20%) of the Site. This area includes the existing home, irrigated lawn, shrubs, native trees, hardscape, and gravel and paved driveways. A section of this area consists of mowed native grassland.

3.0 Wildland Fire Risk and Hazard Severity

This wildfire hazard assessment is based on Colorado State Forest Service (CSFS) Wildfire Risk data (CSFS, 2025a) shows the following for the Site:

- **Fire Intensity Scale (FIS)** specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exists. FIS provides a standard scale to measure potential fire intensity (i.e., severity) and consists of four classes where Class 1 is the lowest and Class 5 is the highest intensity. The Site exhibits areas that are rated Low and Moderate with a majority of the Site rated at Moderate. Refer to Figure 5.
- **Burn Probability (BP)** is the annual probability of any location burning due to wildfire. The Site is currently rated at Moderate to Moderate High with a majority of the Site rated at Moderate High. Refer to Figure 6.
- **Values at Risk Rating (VAR)** is an overall rating that combines risk ratings for Wildland Urban Interface (WUI), Forest Assets, Riparian Assets, and Watershed Protection Areas in a single measure of values-at-risk, values and assets that would be adversely impacted by a wildfire. The Site exhibits areas that are rated Low and Moderate and High with a majority of the Site rated at Low. Refer to Figure 7.
- **Wildland Urban Interface Risk (WUI)** is a measure of the potential impact of wildfire on people and their homes. The WUI reflects housing density (house per acre) which reflects the location of people living in the wildland-urban interface and rural areas, a defining factor for potential wildfire impacts to people and homes. The Site exhibits areas that are rated Low, Moderate, and High with a majority of the Site rated at Moderate. Refer to Figure 8.
- **Surface Fuels (SF)**, or fire behavior fuel models, is a characterization of surface fuel models to compute rate of spread, flame length, fireline intensity and other fire behavior metrics based on primary carrier of surface fires, including 1) grass (GR); 2) grass/shrub (GS); 3) shrub (SH); timber litter (TL); and 4) minor and major roads (RNH and RMH). Surface fuels on the Site are currently rated as TLML1-Timber Litter with minor fractions of SH7-Very High Load Dry Climate Shrub, and RNH Minor Roads. A majority of the Site is rated as TLML1-Timber Litter. Refer to Figure 9.
- **Canopy Cover (CC)** illustrates the percentage of tree canopy cover within the Site and ranges from 0% to 100% and is illustrated in increments of 25%. A majority of the Site has 75% canopy cover with approximately equal fractions of 25%, 50% around the existing home in the southwest corner and 100% canopy cover in northeast corner of the Site. Refer to Figure 10.
- **Slope (S)** refers to the vertical incline of the land in reference to horizontal (rise to run) expressed as a percentage. Slope is a primary influence on wildland fire behavior, especially when wind is involved. The Site slopes range from Lowest to Low with the steepest portions in the northwest and northeast corners of the Site. Steeper slopes in the northeast corner of the Site tilt toward Kettle Creek. Refer to Figure 11.
- **Historical Wildfire Occurrence or Fire Ignitions (Heat Map)** data provides insight as to the number of fires, acres burned, and cause of fires in Colorado (federal & non-federal). Fire Occurrence is an ignition density that represents the likelihood of a wildfire starting based on historical ignition patterns. The Site is currently rated at 9 (Highest Occurrence). Refer to Figure 12.

- **Wildfire Risk** is the overall composite risk occurring from a wildfire derived by combining Burn Probability and Values at Risk Rating. Within a regional context, the Site is rated as Low to moderate with a majority of the Site rates as Low. Refer to Figure 13.

Refer to Appendix B, CSFS Colorado Wildfire Risk Public Viewer Map Theme Descriptions for further detail on the themes discussed above.

According to the Code (EPC, 2021), *additional fire precaution measures may be required because of fire hazard in the following areas:*

- Areas depicted as forested on the Vegetation Map;*
- Areas rated as fire hazards by the CSFS;*
- Where slopes in or adjacent to proposed development are in excess of 20%; or*
- Where the local fire protection agency identifies a specific fire danger. (EPC, 2021).*

Ponderosa pine forested areas depicted on current aerial imagery (dated March 2, 2025) and the Vegetation Map generally cover the majority (80%) of the Site. Refer to Figure 3, Existing Condition Aerial Photo and Figure 4, Vegetation Map. The CSFS does not specifically rate fire hazards. However, they do rate nearly every portion of the landscape throughout the State for the Wildfire Risk data documented above. If Wildfire Risk is an overall composite risk occurring from fire hazards derived by combining Burn Probability and Values at Risk, the wildland fire risk for the Site is currently rated as Low (CSFS, 2025a). Refer to Figure 13, Regional Values at Risk Map. If Fire Intensity Scale (FIS) is a measure of potential fire intensity (or a proxy for severity), the hazard severity for the Site is rated as Moderate (Class 3), (CSFS, 2025a). Refer to Figure 5, Potential Fire Intensity Map. CSFS defines intensity/hazard severity for these classes as follows:

- *Class 2, Low Intensity: Small flames, usually less than 2 feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.*
- *Class 3, Moderate Intensity: Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.*
- *Class 4, High Intensity: Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.*

The Site sits on top of a hill. Lowest slopes in this area ranging between 1-4%. Low slopes drop off from the hilltop toward the northwest and northeast between 5-12%. Given that the majority (80%) of the Site is forested and the CSFS has rated the Site as having Moderate FIS and BP, the Code requires the preparation of a Wildfire Hazard Mitigation Plan as generally described in the following sections.

4.0 Wildfire Hazard Mitigation and Forest Management

As stated by the CSFS, “Wildfires are a natural part of Colorado’s forests. If you live in the wildland-urban interface in Colorado, where homes and other structures intermingle with wildland vegetation, you are at risk of being affected by wildfire. Planning ahead and taking action can increase the likelihood that your home survives when a wildfire occurs. Firefighters always do their best to reduce fire damage, but ultimately, it is the homeowner’s responsibility to protect their property from wildfire” (CSFS, 2025b).

In order to protect new homes from wildfire, the Applicant will implement wildfire hazard protection and mitigation measures included herein (or by reference). This report should be provided to each homeowner (existing and new). Thereafter, it is expected that individual builders and homeowners will take responsibility for addressing home ignition, defensible space (including tree and ladder fuel removal and thinning), fire mitigation, and residential landscaping according to the following resources:

- CSFS Home Ignition Zone Guide (Appendix C);
- EPC Office of Emergency Management Wildfire Mitigation and Defensible Space located on-line at <https://admin.elpasoco.com/pproem/fire-mitigation>;
- El Paso County Sheriff’s Office Community Wildfire Protection Plan for Unincorporated El Paso County (Appendix D); and
- Colorado State University Extension Fire-Resistant Landscaping (Appendix E).

Refer to the attached appendices and on-line links to the above listed resources.

According to the EPC Office of Emergency Management (EPC, 2022), some wildfire mitigation and defensible space measures to help future residents manage forested areas, defend a buffer and save their homes from wildfire include:

- *Rake up dead grass, pine needles, leaves, and pinecones and dispose of them*
- *Remove dead or dying trees and bushes*
- *Keep the grass yard and fields mowed*
- *Trim low hanging tree branches, 6-foot clearance to the ground*
- *Trim any branches that are within 10 feet of your house and building*
- *Trim any branches that hang over your roof or near your chimney*
- *Clean out roof gutters*
- *Clean out under decks and around gardens*
- *Move wood piles at least 50 feet away from your home*
- *Remove old junk piles that contain flammable materials*
- *Select fire-safe landscaping and fire-resistant plants*
- *Use synthetic fire-resistant materials for decks and fencing*
- *Purchase fire-resistant patio furniture*
- *Cut down trees based on spacing and the slope of the property*
- *Make sure driveways and property are accessible for fire trucks to enter, turn around, and exit*

5.0 Fire Protection and Design Standards

5.1 Reports and Commitments for Subdivisions

The Site is located within the jurisdiction and boundaries of the Black Forest Fire Rescue Protection District (BFRFPD) as documented in the Black Forest Community Wildfire Protection Plan (BFFR, 2007). The BFRFPD covers 52 square miles, protects approximately 5,500 structures and has a population of around 40,000 people. They have 2 stations with staff and equipment as described below:

Station 1: Station 1 is our headquarters, located at 11445 Teachout Rd, Colorado Springs, CO 80908. The station was opened in 2003. Staffing at Station 1 is typically 5 firefighters.

Apparatus at Station 1 include:

- Engine 711 (Type 1, 750 gallons)
- Medic 781 (Ambulance)
- Brush 741 (Type 6)
- Tender 761 (1800 gallons)
- Wildland Type 3
- Reserve Tender
- Reserve Brush
- Reserve Engine
- Command vehicles

Station 2: Located at 16465 Ridge Run Dr, Colorado Springs, CO 80908, the station was opened in 2009. Staffing at Station 2 is typically 3 firefighters.

Apparatus at Station 2 include:

- Engine 712 (Type 1, 750 gallons)
- Brush 742 (Type 6)
- Medic 782 (Ambulance)

The Applicant will provide the following under separate cover:

- **Fire Protection Report** to include the capabilities, including existing and proposed equipment, facilities, services, response time to provide fire protection for the proposed subdivision, an analysis of compliance with the Fire Protection and Wildfire Mitigation Section of the Code, and an analysis of compliance with the applicable fire code;
- **Fire Protection Commitment** from the local fire protection District to include a written commitment that they will provide structural fires protection for the proposed subdivision;
- **Mitigation Costs Included in the Construction Financial Assurances** if the EPC Board of County Commissioners determines that wildfire mitigation issues are significant enough to require mitigation associated with development construction activities; and
- **Annex and Provide Evidence of a Contract for Service from a Fire District or Department** if the proposed subdivision is located outside the boundaries of an existing District or Department.

5.2 General Design Standards

The EPC Code for Fire Protection and Wildfire Mitigation must be followed by the Applicant for the common areas and all newly constructed buildings. Common area standards include water supply, roads, bridges, non-road access and access gates. Lot development standards include those for the location of building envelopes, buildings and accessory structures; roof design and materials; interior and exterior irrigation and interior fire suppression systems; emergency access to structures, access to structures not protected by automatic sprinklers, and separation between structures that are potentially threatened by wildland fire. These elements shall be designed, located, and constructed by individual homeowners, their planners, engineers, architects and future home builders to comply with the Code and National Fire Protection Association (NFPA) codes and standards under the review of El Paso County. The proof or certification (if necessary) for meeting the EPC design standards and fire codes will be provided by the homeowners separately from this Plan.

In general, it is recommended that new building envelopes and buildings should be located in low fire risk areas of the Site and implement defensible space measures within those areas. Interior and exterior well pump, water supply and irrigations systems, including back-up power systems are recommended to be provided to suppress fires from spreading to homes or from homes outward if a residential fire occurs and electricity grids are shut down.

6.0 Summary

Based on the vegetation, surface fuels, canopy cover, slope, weather conditions, wildland urban interface, highest historic occurrence of fire ignition, potential fire intensity and the burn probability of this Site within the Black Forest, the wildfire risk for the Site is rated Low to Moderate (CSFS, 2025a). Please refer to Figure 5, Potential Fire Intensity Map, Figure 6, Burn Probability, and Figure 13, Regional Values at Risk Map as a guide for understanding potential wildfire risk. The Site development plan will conform to County development, design and construction standards for fire protection. Fire hazard and defensible space mitigation on each lot will be the ultimate responsibility of future landowners according to CSFS and El Paso County fire hazard mitigation resources including but not limited to those referenced and provided herein.

6.0 References

BFFR (Black Forest Fire and Rescue), 2007. Black Forest Community Wildfire Protection Plan. October 11, 2007.

CSFS (Colorado State Forest Service), 2025. Colorado State Forest Service Home Ignition Zone guide, available at: <https://csfs.colostate.edu/wildfire-mitigation/protect-your-home-property-from-wildfire>. Last accessed October 6, 2025.

CSFS 2025a. Wildfire Risk Viewer, available at: <https://coloradoforestatlas.org>. Last accessed October 6, 2025.

CSFS, 2025b. Colorado State Forest Service Home and Property Protection data, available at: <https://csfs.colostate.edu/wildfire-mitigation/protect-your-home-property-from-wildfire>. Last accessed October 6, 2025.

CSU (Colorado State University Extension), 1999. Fire-Resistant Landscaping Fact Sheet No. 6.303, available at <https://extension.colostate.edu/docs/pubs/natres/06303.pdf>. Last accessed October 6, 2025.

EPC (El Paso County), 2021. El Paso County Land Development Code 20-001 for Fire Protection and Wildfire Mitigation. October 8, 2025.

EPC, 2022. Office of Emergency Management Wildfire Mitigation and Defensible Space located online at <https://admin.elpasoco.com/pproem/fire-mitigation>

EPC, 2011. Community Wildfire Protection Plan for Unincorporated El Paso County. June, 2021.

Hannigan, 2024. Wildfire Hazard Assessment and Mitigation Report for the Proposed New Breed Ranch Filing Three. Jerome W. Hannigan and Associates, Inc. January 25, 2024.

WEATHER SPARK, 2025. Weather Spark. December Weather in Black Forest Colorado, United States. Available at [https://weatherspark.com/m/3699/12/Average-Weather-in-December-in-Black-Forest-Colorado-United-](https://weatherspark.com/m/3699/12/Average-Weather-in-December-in-Black-Forest-Colorado-United-States#:~:text=The%20growing%20season%20in%20Black,9%20or%20after%20October%2017)

[States#:~:text=The%20growing%20season%20in%20Black,9%20or%20after%20October%2017](https://weatherspark.com/m/3699/12/Average-Weather-in-December-in-Black-Forest-Colorado-United-States#:~:text=The%20growing%20season%20in%20Black,9%20or%20after%20October%2017). Last accessed October 9, 2025.

DISCLAIMER

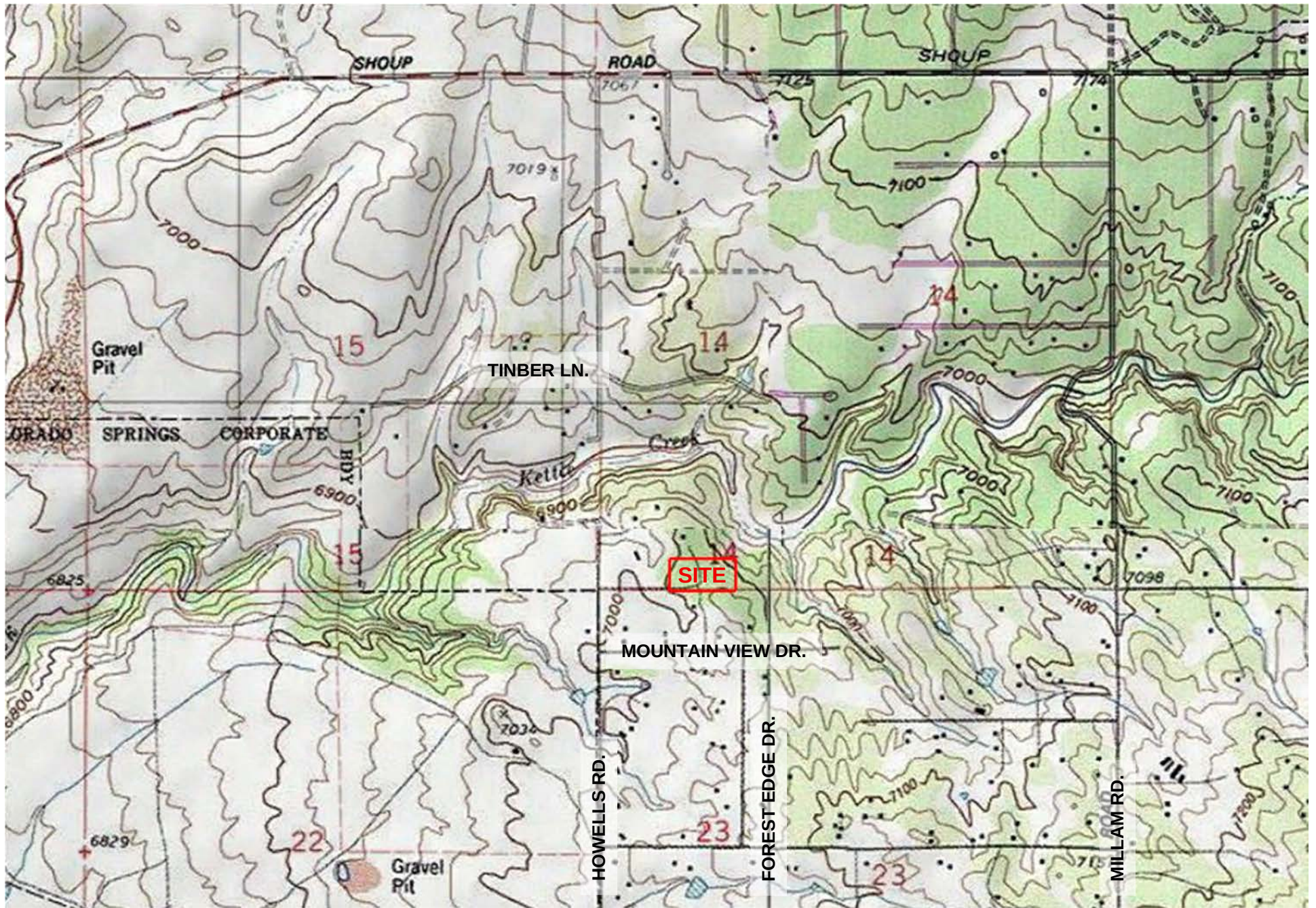
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Users should note that property boundaries included herein do not represent an on-the-ground survey suitable for legal, engineering, or surveying purposes. They represent only the approximate locations.

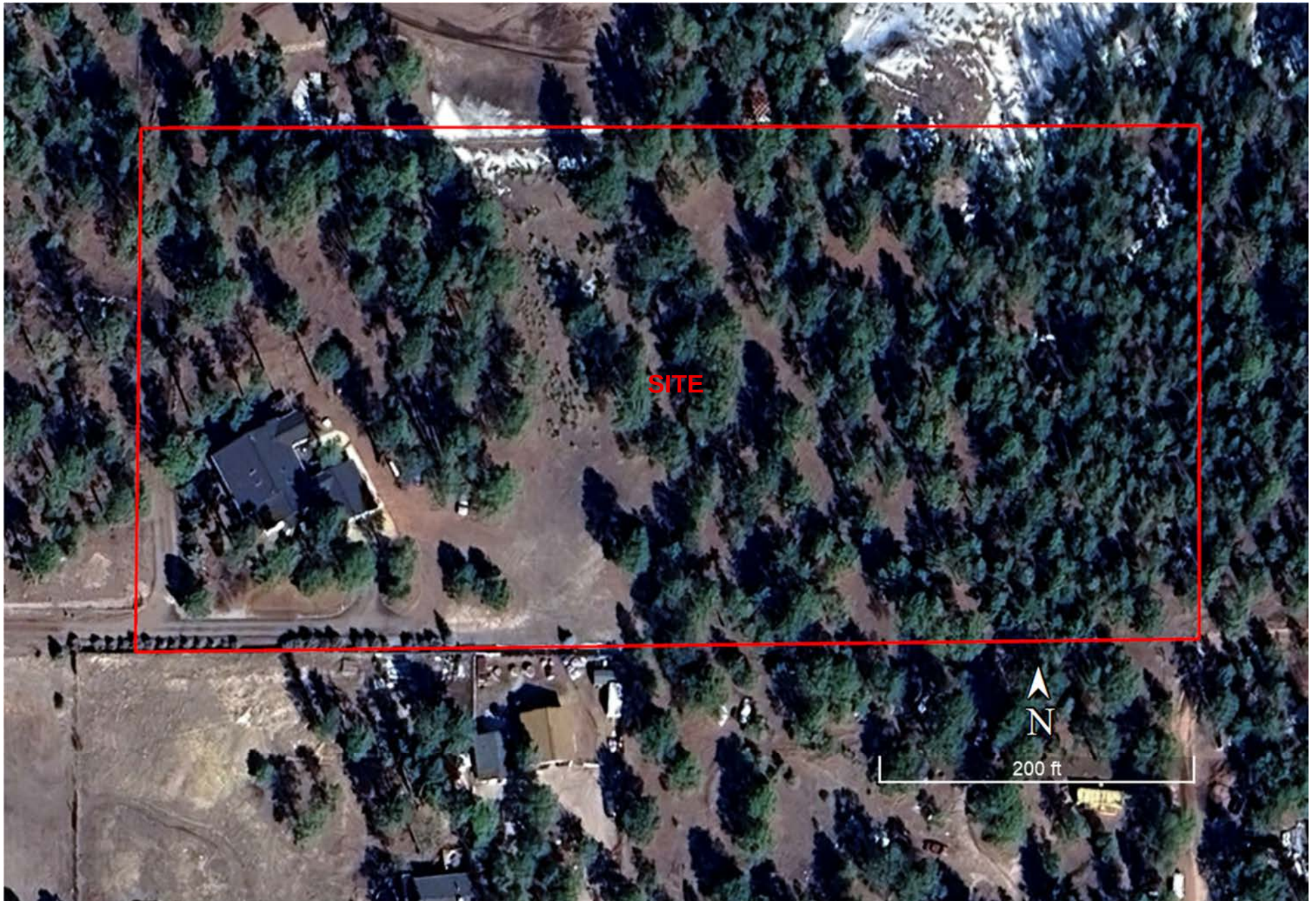
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The user of this report assumes the entire risk related to their use of this information, references, or any products used herein. In no event will ECOS be liable to Guman, the Applicant, or any third party for any direct, indirect, incidental, consequential, special or exemplary damages resulting from any use or misuse of this data, even if the user has been advised of the possibility of such damages.

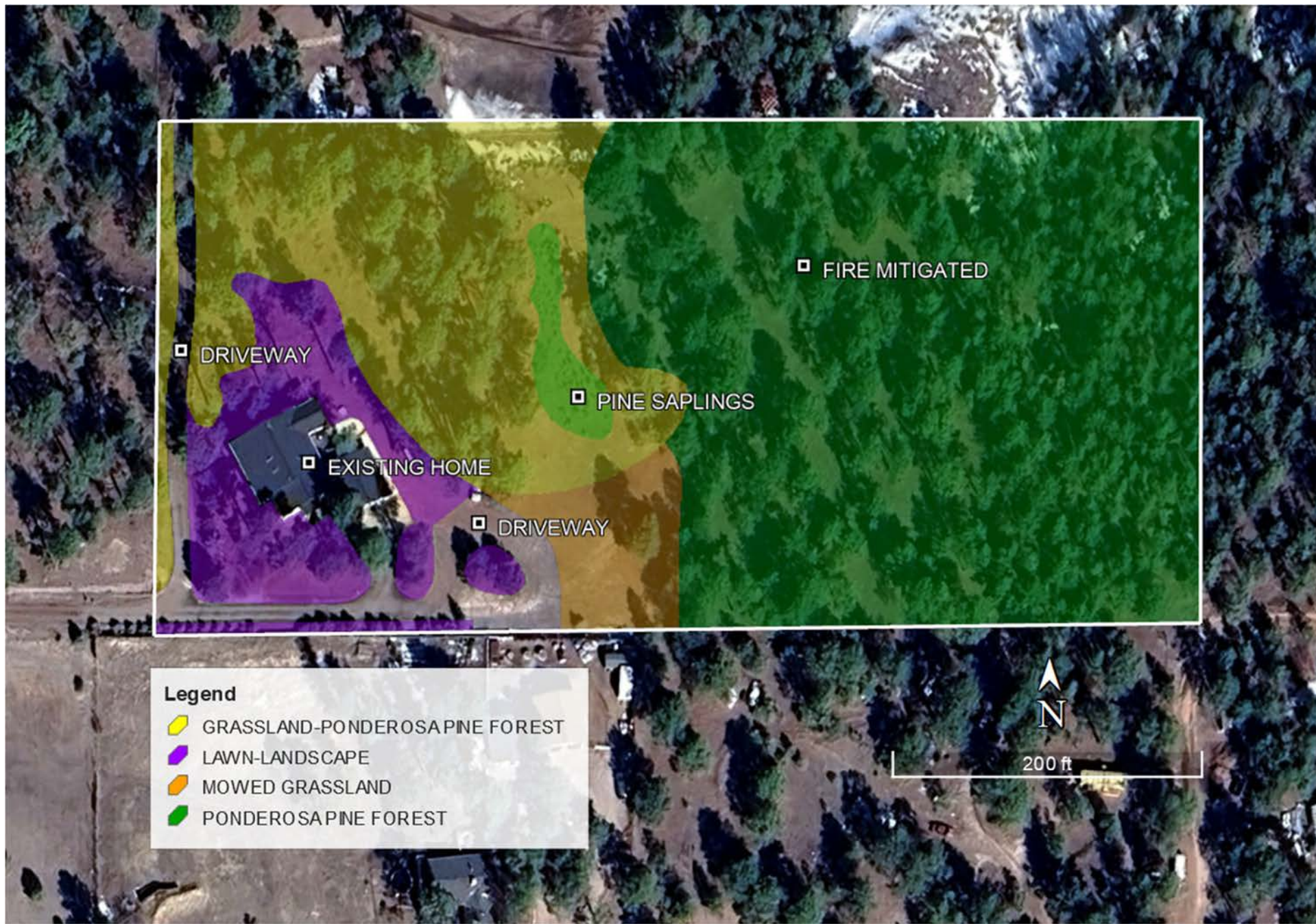
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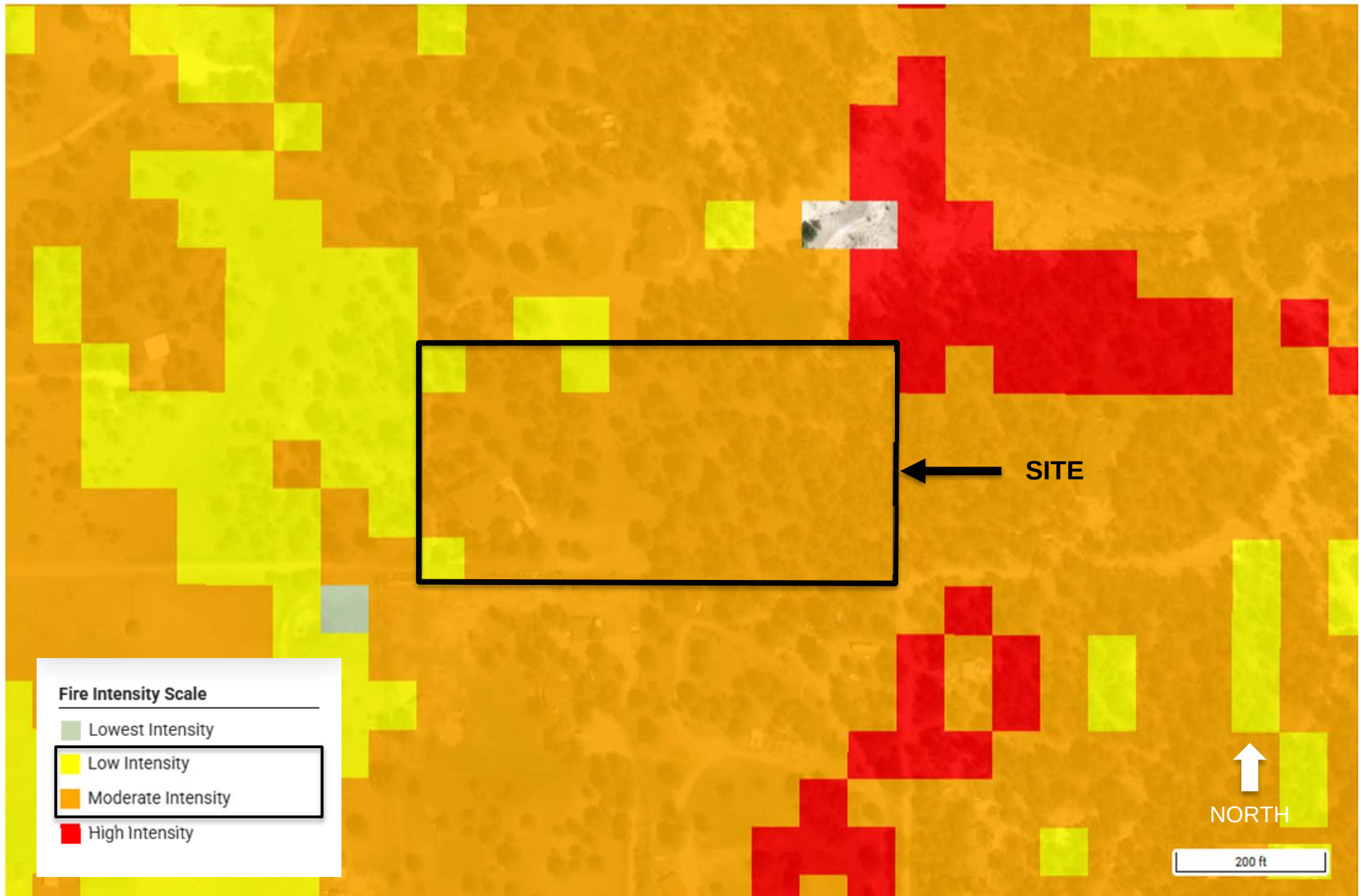
SOURCE: United State Geological Survey (USGS)



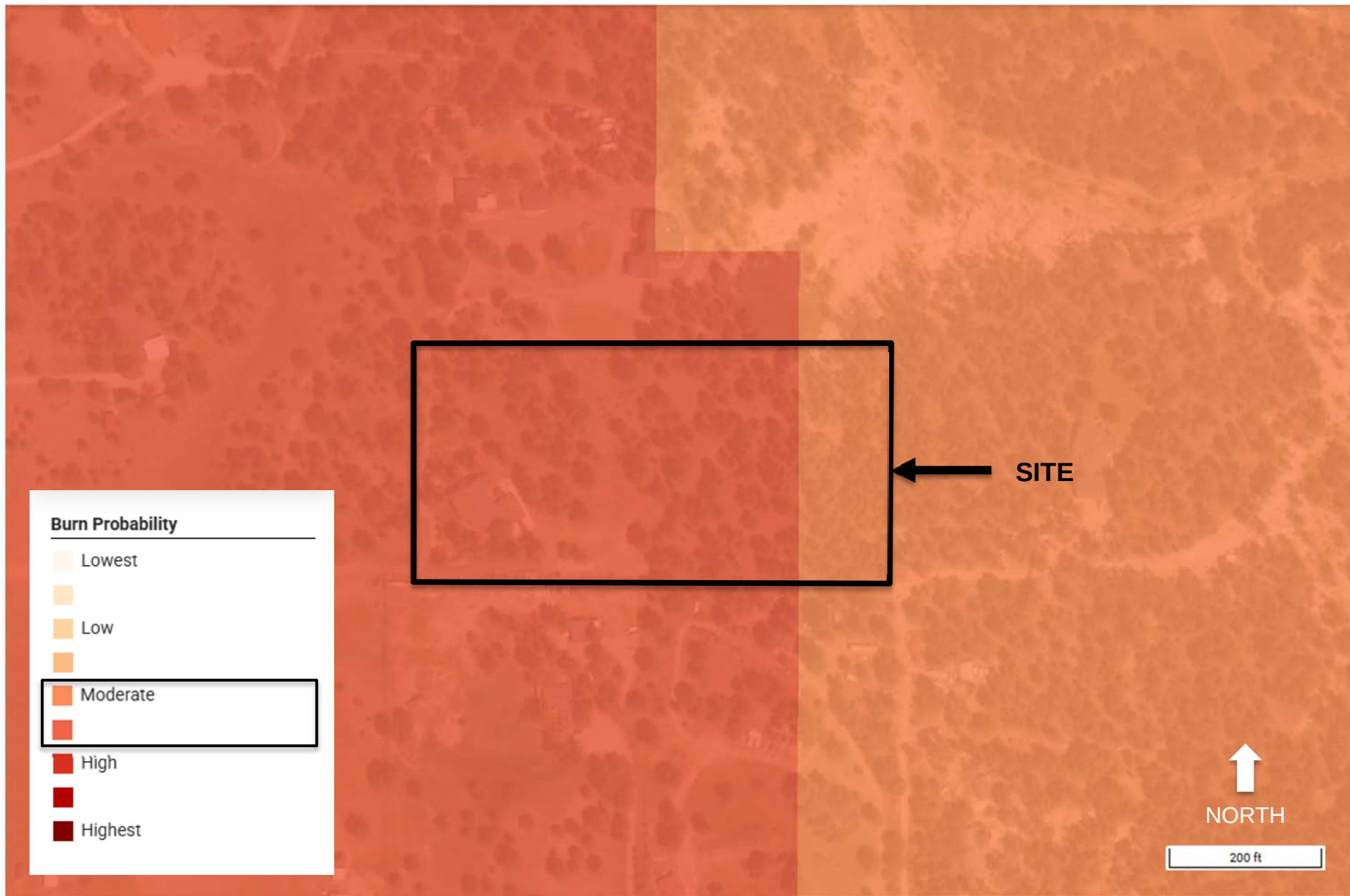
SOURCE: Google Earth (GE), Imagery Date: 3/2/2025



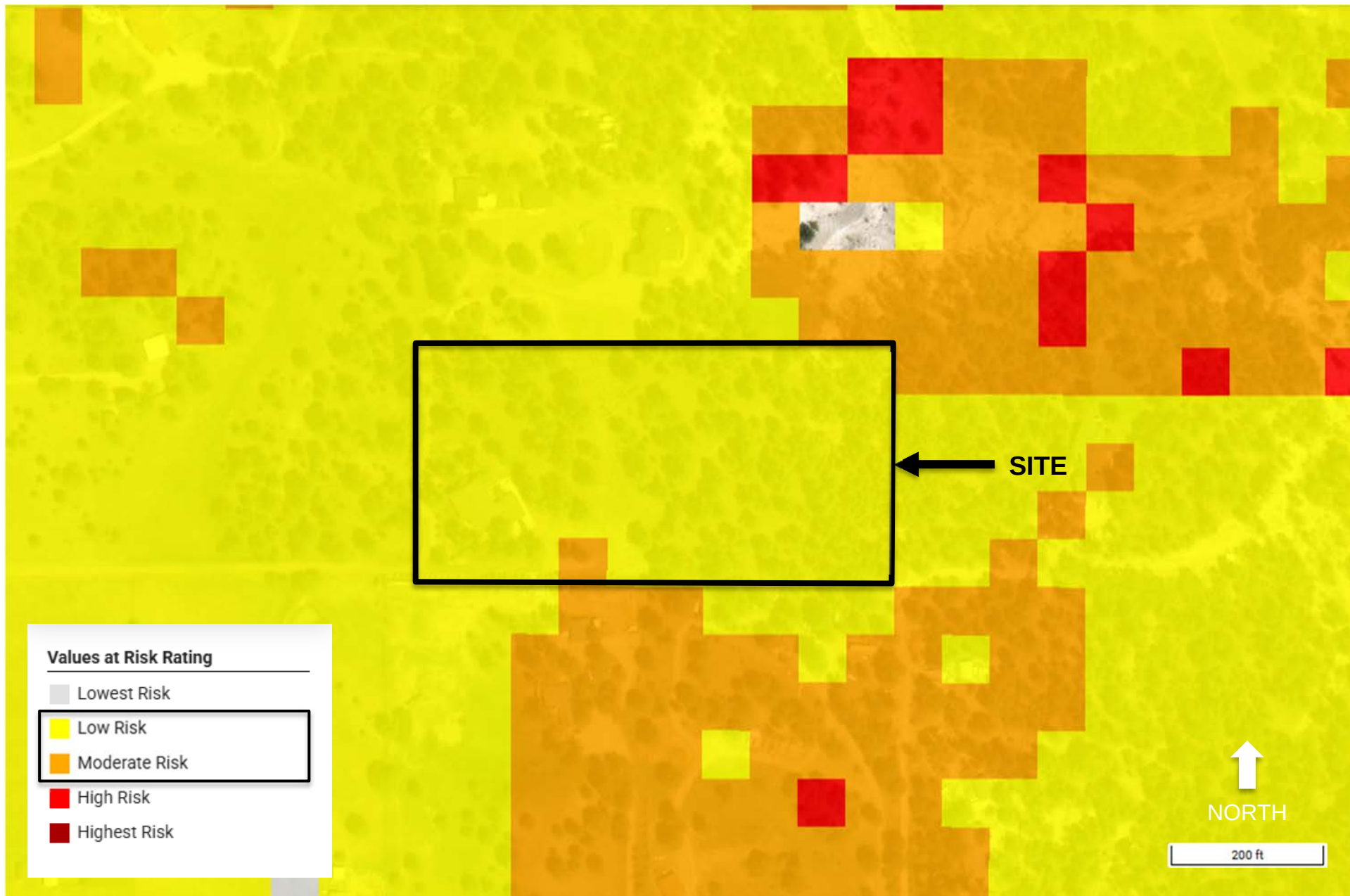
SOURCE: Colorado State Forest Service (CSFS), Wildfire Risk Public Viewer, accessed on 10/6/2025



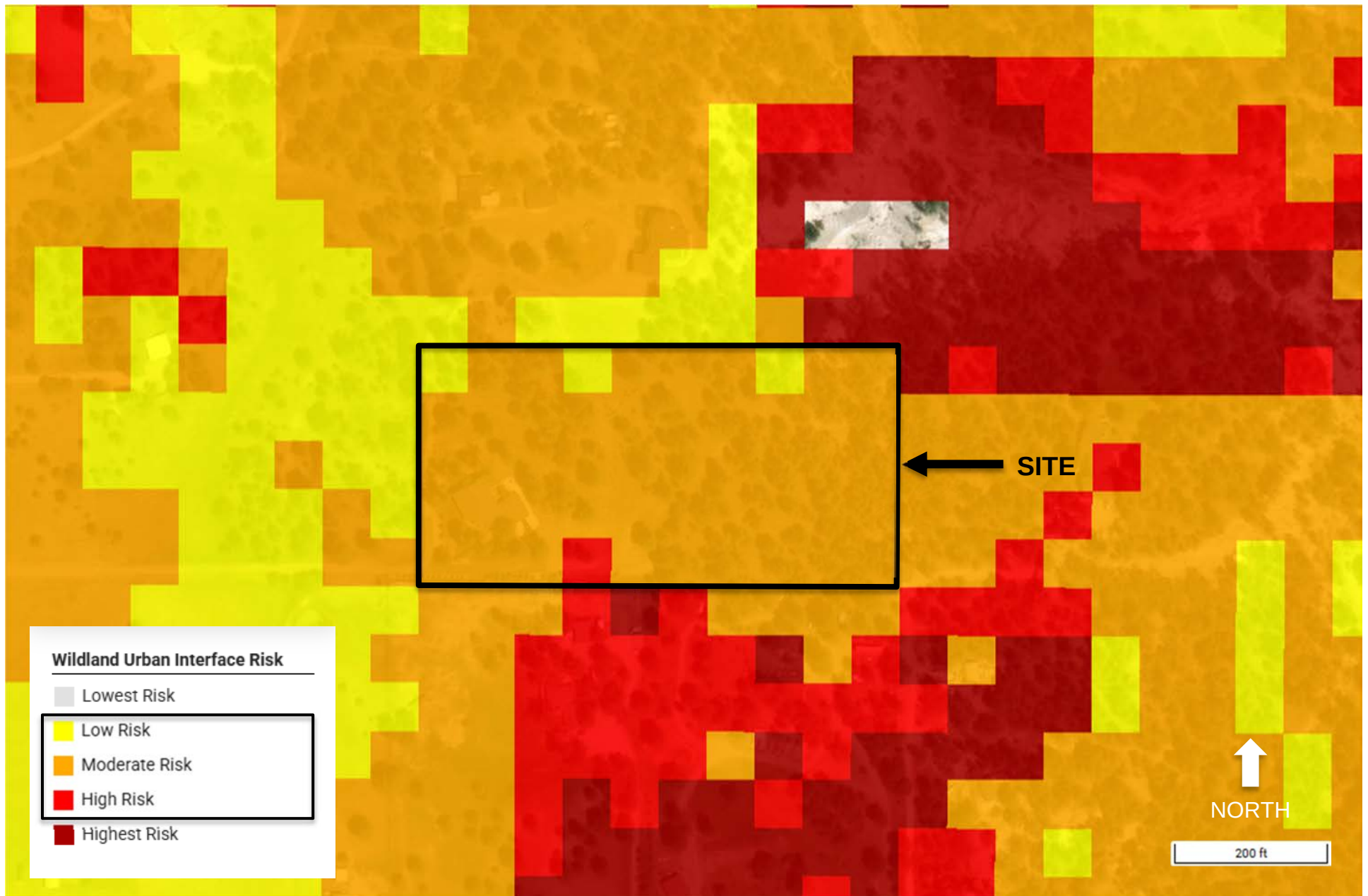
SOURCE: Colorado State Forest Service (CSFS), Wildfire Risk Public Viewer, accessed on 11/13/2025



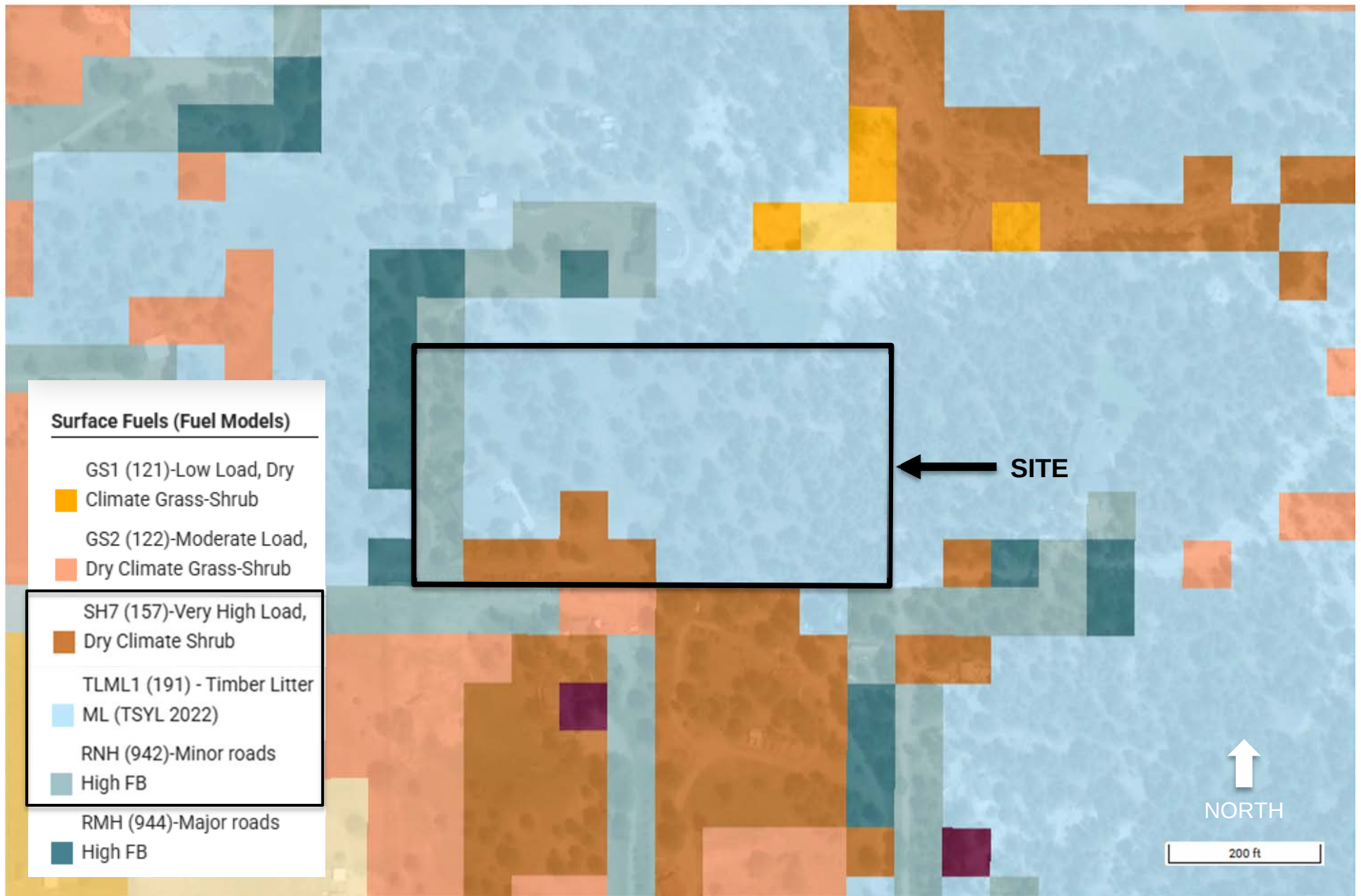
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SOURCE: Colorado State Forest Service (CSFS), Wildfire Risk Public Viewer, accessed on 11/13/2025



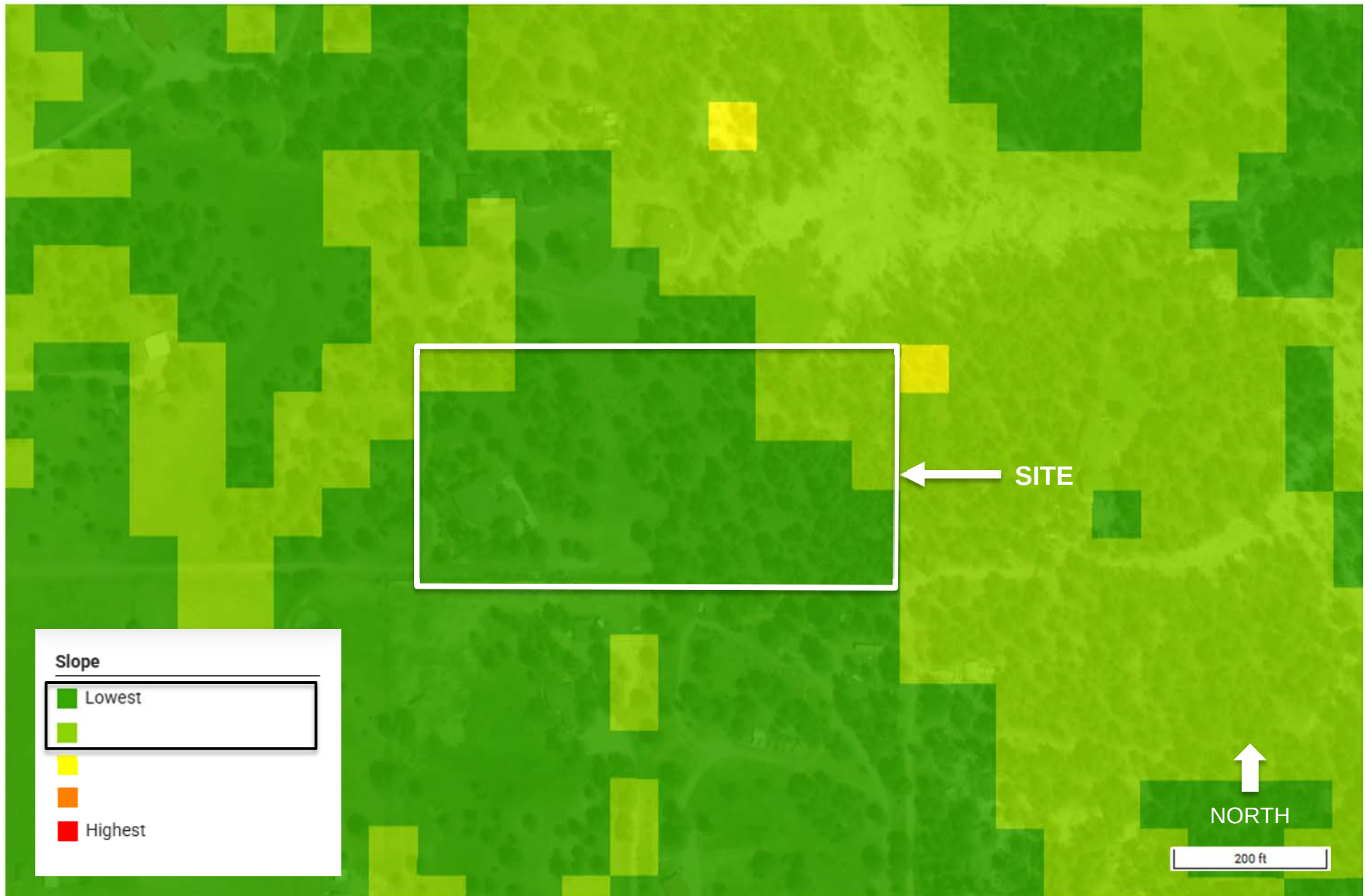
SOURCE: Colorado State Forest Service (CSFS), Wildfire Risk Public Viewer, accessed on 11/13/2025



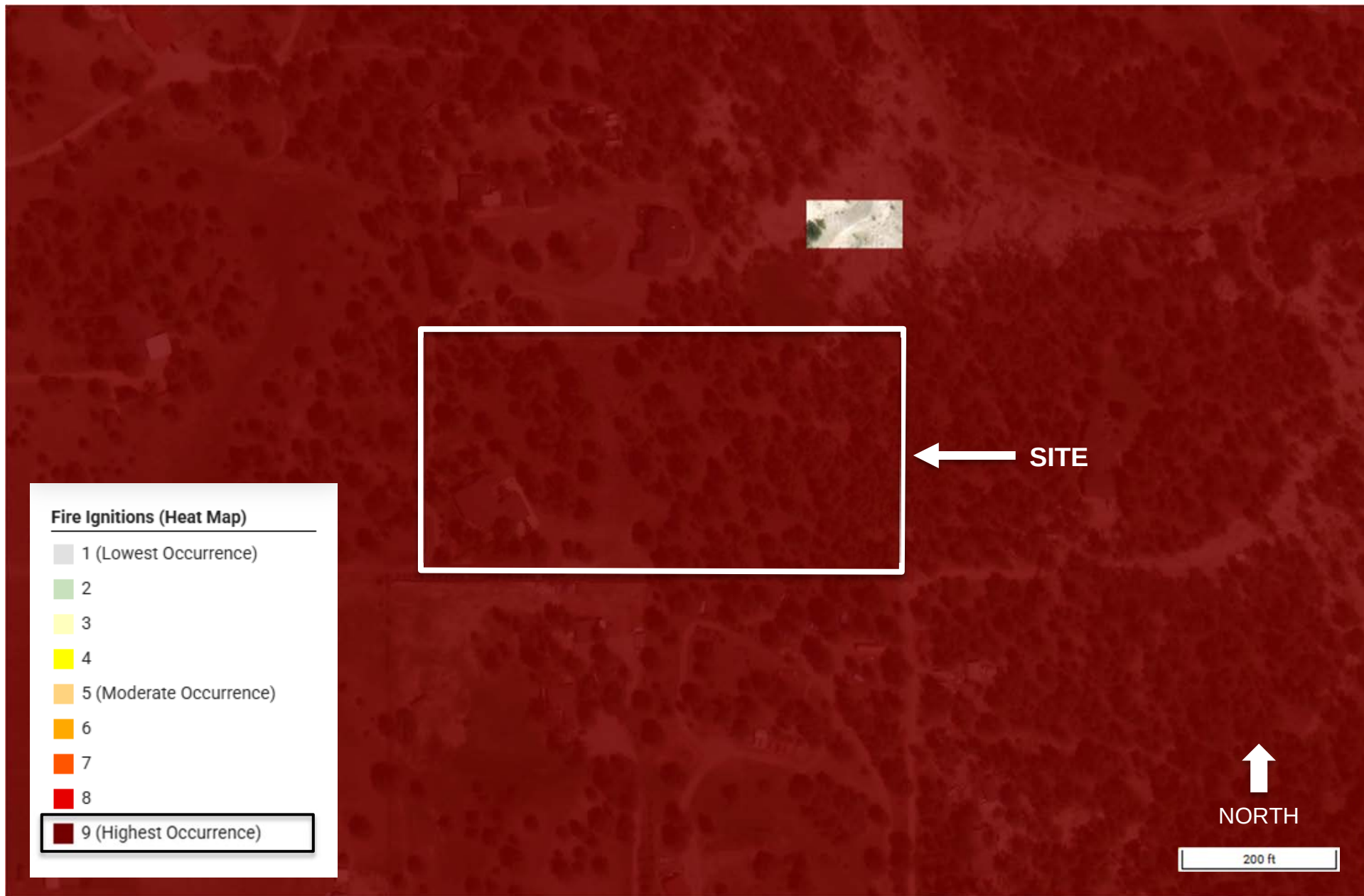
SOURCE: Colorado State Forest Service (CSFS), Wildfire Risk Public Viewer, accessed on 11/13/2025



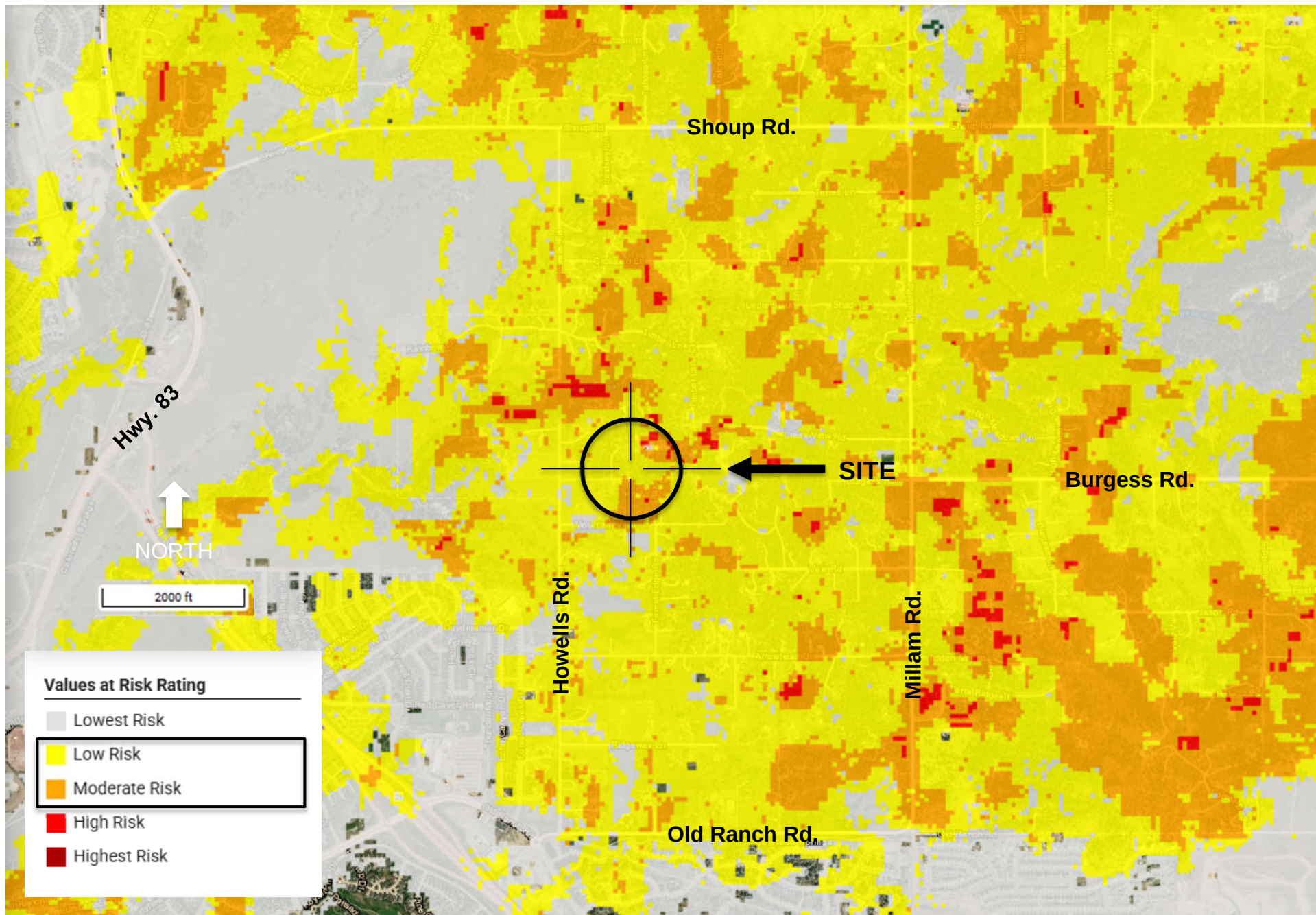
SOURCE: Colorado State Forest Service (CSFS), Wildfire Risk Public Viewer, accessed on 11/13/2025



SOURCE: Colorado State Forest Service (CSFS), Wildfire Risk Public Viewer, accessed on 11/13/2025



SOURCE: Colorado State Forest Service (CSFS), Wildfire Risk Public Viewer, accessed on 11/13/2025



SOURCE: Colorado State Forest Service (CSFS), Wildfire Risk Public Viewer, accessed on 10/6/2025

APPENDIX A
El Paso County Fire Protection and Wildfire Mitigation Code

Back

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El Paso County, CO



221015675

RESOLUTION NO. 21-36

EL PASO COUNTY BOARD OF COUNTY COMMISSIONERS, STATE OF COLORADO

APPROVAL OF AMENDMENT TO THE LAND DEVELOPMENT CODE (LDC-20-001) Fire Protection and Wildfire Mitigation

WHEREAS, the Planning and Community Development Department of El Paso County requests approval of Amendment(s) to Chapter(s) 1, 5, and 6 of the Land Development Code as herein described, including other conforming amendments throughout the Code;

WHEREAS, a public hearing was held by the El Paso County Planning Commission on January 7, 2021, upon which date the Planning Commission did by formal resolution recommend approval of the proposed amendments, and

WHEREAS, a public hearing was held by this Board on January 26, 2021; and

WHEREAS, based on the evidence, testimony, exhibits, consideration of the master plan for the unincorporated area of the County, presentation and comments of the El Paso County Planning and Community Development Department and other County representatives, comments of public officials and agencies, comments from all interested persons, comments by the general public, comments by the El Paso County Planning Commission Members, and comments by the Board of County Commissioners during the hearing, this Board finds as follows:

1. The proposed amendment(s) to the El Paso County Land Development Code Choose an item. properly submitted for consideration by the Planning Commission.
2. Proper publication and public notice were provided as required by law for the hearing before the Planning Commission.
3. The hearing before the Planning Commission was extensive and complete, that all pertinent facts, matters and issues were submitted and that all interested persons were heard at that hearing.
4. All data, surveys, analyses, and studies, as are required by the State of Colorado and El Paso County have been submitted, reviewed, and were received into evidence and found to meet the intent of the Introductory Provisions of the Land Development Code.

5. For the above-stated and other reasons, the proposed Amendment(s) are in the best interest of the health, safety, morals, convenience, order, prosperity and welfare of the citizens of El Paso County.

NOW, THEREFORE, BE IT RESOLVED the El Paso County Board of County Commissioners hereby approves the amendment(s) to Chapter(s) 1, 5, and 6 of the El Paso County Land Development Code, including other conforming amendments throughout the Code, as represented on the attached Exhibit "A" by underlining (additions) and strike-through (deletions):

AND BE IT FURTHER RESOLVED that the Executive Director of Planning and Community Development is hereby authorized and directed to develop procedures for the provision of public notice of and opportunity to submit comments on applications for administrative plat approval and for the appeal of administrative plat approval or denial to the Board of County Commissioners.

AND BE IT FURTHER RESOLVED the record and recommendations of the El Paso County Planning Commission be adopted, except as modified herein.

DONE THIS 26th day of January, 2021 at Colorado Springs, Colorado.



BOARD OF COUNTY COMMISSIONERS
OF EL PASO COUNTY, COLORADO

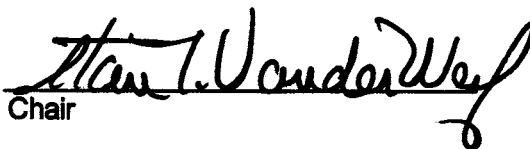
By: 
Chair

EXHIBIT A

See attached redline revisions.

EL PASO **COUNTY**
COLORADO

COMMISSIONERS:
MARK WALLER (CHAIR)
LONGINOS GONZALEZ, JR. (VICE-CHAIR)

HOLLY WILLIAMS
STAN VANDERWERF
CAMI BREMER

PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT
CRAIG DOSSEY, EXECUTIVE DIRECTOR

**TO: El Paso County Planning Commission
Brian Risley, Chair**

**FROM: Nina Ruiz, Planning Manager
Mark Gebhart, Deputy Director
Craig Dossey, Executive Director**

**RE: LDC-20-001 -- Land Development Code Amendment --
Fire Protection and Wildfire Mitigation Amendment to Chapters 1, 5,
and 6 of the El Paso County Land Development Code (2019) to
remove discrepancies, and add and modify language to eliminate the
term "Fire Marshal"**

Commissioner District: All

Planning Commission Hearing Date	1/7/2020
Board of County Commissioners Hearing Date	1/26/2020

EXECUTIVE SUMMARY

A request by the El Paso County Planning and Community Development Department to amend Chapters 1, 5, and 6 of the El Paso County Land Development Code (2019) to remove discrepancies, and add and modify language to eliminate the term "Fire Marshal".

The proposed amendments include:

- Amend throughout to replace the term "Fire Marshal" with "Fire Authority"
- Amend Chapter 1 to amend the definition of what will be termed "Fire Authority", to include a Fire District, Fire Department, or Third-Party Fire Reviewer;
- Amend Chapter 1 to add the term "Third Party Fire Reviewer" to apply to those areas of the County outside of a fire district or fire department;
- Amend Chapter 5, Fireworks Sales, to add language specifying that firework sales are not permitted if the Sheriff has implemented a fire ban;

2880 INTERNATIONAL CIRCLE, SUITE 110
PHONE: (719) 520-6300



COLORADO SPRINGS, CO 80910-3127
FAX: (719) 520-6695

- Amend Chapter 6, Fire Protection and Wildfire Mitigation, throughout to revise all occurrences where authority currently lies with the “Fire Marshall” to instead place such authority with the Board of County Commissioners or PCD Director, where applicable.
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to specifically state that PCD will request a recommendation from the “Fire Authority” in regard to alternatives as well as compliance with the applicable regulations;
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to amend the required content of the Fire Protection Report to add that the report must include an analysis of how the request complies with the Code and any applicable fire code;
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to add an additional subsection regarding Development Outside Fire District or Fire Department Boundaries which requires that the property either annex into a fire district or fire department or receive approval of a waiver from the Board of County Commissioner based upon specific criteria;
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to remove specific requirements regarding automatic fire protection and instead to require development to meet the requirements of the adopted building code;
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to specify that the Fire Authority may determine the most appropriate location for fire hydrants; and
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to require that dry hydrants meet the NFPA standards in place of the hydrants being approved by the “Fire Marshall” without specific standards being referenced.

Staff is also requesting authority to make all other conforming amendments necessary to carry out the intent of the BoCC.

A. PLANNING COMMISSION SUMMARY

Request Heard:

Recommendation:

Waiver Recommendation:

Vote:

Vote Rationale:

Summary of Hearing:

Legal Notice:

B. APPLICABLE RESOLUTIONS:

Approval Page 7

Disapproval Page 8

C. REQUEST

A request by the El Paso County Planning and Community Development Department to amend the El Paso County Land Development Code (2019) to include:

- Amend throughout to replace the term “Fire Marshal” with “Fire Authority”

- Amend Chapter 1 to amend the definition of what will be termed “Fire Authority”, to include a Fire District, Fire Department, or Third-Party Fire Reviewer;
- Amend Chapter 1 to add the term “Third Party Fire Reviewer” to apply to those areas of the County outside of a fire district or fire department;
- Amend Chapter 5, Fireworks Sales, to add language specifying that firework sales are not permitted if the Sherriff has implemented a fire ban;
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- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to require that dry hydrants meet the NFPA standards in place of the hydrants being approved by the “Fire Marshall” without specific standards being referenced.

Staff is also requesting authority to make all other conforming amendments necessary to carry out the intent of the BoCC.

D. BACKGROUND

Staff has worked with stakeholders as well as governmental agencies to draft proposed amendments to the Fire Protection and Wildfire Mitigation section of Code. Those stakeholders that provided input include the Colorado Springs Housing and Building Association, fire districts, Fire Chief, El Paso County Sheriff’s Office, the Pikes Peak Regional Office of Emergency Management, as

well as homeowners association groups. All previous comments received have been addressed.

The El Paso County Land Development Code is routinely amended to respond to current land use trends, recurring issues, changes in legislation, and errors/oversights. The Planning and Community Development Department staff maintains a running list of necessary and recommended revisions to the Code as issues arise. Section 6.3.3 of the Land Development Code was written in 2006 when coordination with the Fire Marshal was in place. The amendments proposed with this specific request are in response to El Paso County no longer having a Fire Marshal position. The internal procedures have been amended over time to reflect the loss of the Fire Marshal position, but the regulations have not been updated. The proposed amendments include revisions to Chapters 1, 5, and 6. The topical items included within the proposed revisions include amendments pertaining to the elimination of the term "Fire Marshal" and the addition of the term "Third Party Fire Reviewer". Staff anticipates additional future amendments to the Wildfire Protection section to remove inconsistencies with other rules and regulations but chose to keep the proposed amendments limited to the "Fire Marshal" concern only.

Replace "Fire Marshal" with "Fire Authority"

El Paso County has not recently employed a Fire Marshal but utilizes a Fire Warden who had different powers and authorities than a Fire Marshal. Chapter 6 of the Land Development Code (2019) refers to a Fire Marshal multiple times. Planning and Community Development has relied upon the recommendations of the fire districts and departments, who are the subject matter experts, in place of the Fire Marshal. Each one of the Fire Districts or Fire Departments has their own Fire Marshal. Planning and Community Development is proposing to amend the Code to mirror our current practices to remove the term "Fire Marshal" and replace it with "Fire Authority" in order to avoid confusion.

If approved, the Fire Authority will include fire departments, fire districts, and a third-party fire authority. The current regulations rely heavily on the Fire Marshal approving many fire protection elements. Staff is not proposing to defer all approval authority to the Fire Authority, but instead to rely upon their recommendations. The Fire Authorities are not governed by El Paso County and, therefore, need not report to El Paso County. Staff believes for this reason it is appropriate that the ultimate authority remain with El Paso County.

Third Party Fire Reviewer

The majority of properties in El Paso County are within a Fire District or Fire Department, however, there are still some areas without fire protection. The unserved areas are primarily in the mountainous portions of the County, the numerous enclaves within the City of Colorado Springs, and the land generally between the eastern limits of Colorado Springs and the Ellicott Fire Protection District (see attached map).

Without a Fire Marshal, the proposed Land Development Code amendments rely on the expertise of the fire departments and fire districts to provide comment when proposed development will not meet the standards. Staff is proposing the addition of the term Third Party Fire Reviewer which will apply to those parcels without fire protection. The proposed definition includes language as to who may be qualified to serve as the Third Party Fire Reviewer.

In addition to the additional definition, staff is proposing to add language to require all parcels undergoing a development application to annex into a fire district or fire department. If they cannot, they must request a waiver from this requirement before the Board of County Commissioners. The Board of County Commissioners then must review the request based upon specific criteria including evidence that it is not feasible to annex into a fire district or fire department and that the request meet all other Sections included in the Fire Protection and Wildfire Mitigation section of the Code.

E. RECOMMENDED AMENDMENTS

A request by the El Paso County Planning and Community Development Department to amend the El Paso County Land Development Code (2019) to include:

- Amend throughout to replace the term “Fire Marshal” with “Fire Authority”
- Amend Chapter 1 to amend the definition of what will be termed “Fire Authority”, to include a Fire District, Fire Department, or Third-Party Fire Reviewer;
- Amend Chapter 1 to add the term “Third Party Fire Reviewer” to apply to those areas of the County outside of a fire district or fire department;
- Amend Chapter 5, Fireworks Sales, to add language specifying that firework sales are not permitted if the Sherriff has implemented a fire ban;
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, throughout to revise all occurrences where authority currently lies with the “Fire Marshall” to instead place such authority with the Board of County Commissioners or PCD Director, where applicable.
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to specifically state that PCD will request a recommendation from the “Fire Authority” in regard to alternatives as well as compliance with the applicable regulations;
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to amend the required content of the Fire Protection Report to add that the report must include an analysis of how the request complies with the Code and any applicable fire code;
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to add an additional subsection regarding Development Outside Fire District or Fire Department Boundaries which requires that the property either annex into a fire district or fire department or receive approval of a waiver from the Board of County Commissioner based upon specific criteria;

- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to remove specific requirements regarding automatic fire protection and instead to require development to meet the requirements of the adopted building code;
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to specify that the Fire Authority may determine the most appropriate location for fire hydrants; and
- Amend Chapter 6, Fire Protection and Wildfire Mitigation, to require that dry hydrants meet the NFPA standards in place of the hydrants being approved by the "Fire Marshall" without specific standards being referenced.

Staff is also requesting authority to make all other conforming amendments necessary to carry out the intent of the BoCC.

F. APPROVAL CRITERIA

The statutory role of the Planning Commission and Board of County Commissioners is identified below:

30-28-116. Regulations may be amended.

From time to time the board of county commissioners may amend the number, shape, boundaries, or area of any district, or any regulation of or within such district, or any other provisions of the zoning resolution. Any such amendment shall not be made or become effective unless the same has been proposed by or is first submitted for the approval, disapproval, or suggestions of the county planning commission. If disapproved by such commission within thirty days after such submission, such amendment to become effective, shall receive the favorable vote of not less than a majority of the entire membership of the board of county commissioners. Before finally adopting any such amendment, the board of county commissioners shall hold a public hearing thereon, and at least fourteen days' notice of the time and place of such hearing shall be given by at least one publication in a newspaper of general circulation in the county.

G. PUBLIC COMMENT AND NOTICE

A summary of the proposed Code amendments and the date of the Board of County Commissioner hearing will be published in The Fountain Valley News pursuant to Colorado Revised Statute 30-28-116. A copy of this publication will be included in the backup materials for the Board of County Commissioners hearing. All the stakeholders were noticed by EDARP of the hearing date.

H. ATTACHMENTS

Proposed Amendments to the Land Development Code (2019) (redline version)
 Proposed Amendments to the Land Development Code (2019) (clean version)
 All Comments Received
 Letter of Support from the Housing and Building Association

Replace "Fire Marshal" with "Fire Authority" throughout.

Chapter 1 Revisions

~~Fire Marshal Authority~~ — For purposes of this Code, El Paso County Fire Marshal. A the person designated by the Fire District or, Fire Department within whose their boundaries the property lies. This term shall also include a Third-Party Fire Reviewer for properties not located within the boundaries of a Fire District or Fire Department., "Fire Authority" may include the Sheriff's Office for certain fire events

Third Party Fire Reviewer- a person with a minimum of an State of Colorado Inspector II, ICC or NFPA Certification who has provided El Paso County with a copy of such certification and who has self-certified that they are qualified to provide comment and recommendations.

Chapter 5 Revisions

Fireworks Sales

(A) **Sales Period Limited.** Fireworks sales are limited to the period from May 31 st to July 6th each year. Firework sales is prohibited if the Sherriff has implemented a fire ban.

(B) ~~**Fire Department Authority Approval Required.** The fireworks sales area shall be located within an area provided with fire protection by a fire department. Fire department~~Fire Authority approval is required prior to the approval of a temporary use permit.

(C) **Driveway Permit Required.** A driveway permit shall be issued to allow access to the fireworks sales area prior to the approval of a temporary use permit.

(D) **Required Signage.** A fireworks sales area shall post signage noting it is illegal to shoot fireworks within all towns and cities in El Paso County and violators will be prosecuted. Each fireworks sales area shall provide either one sign, with minimum 3 inch letter size, or 4 signs of 8½ by 11 inches, placed in a conspicuous location easily readable by the public, noting the language as stated or similar language approved by the PCD Director.

6.3.3. Fire Protection and Wildfire Mitigation

(A) General.

(1) **Purpose and Intent.** To ensure that proposed development is reviewed in consideration of the wildfire risks and need to provide adequate fire protection in order to:

- Regulate development, buildings, and structures so as to minimize the hazard to public health, safety, and welfare;
- Ensure that adequate fire protection is available for new development;
- Implement wildfire hazard reduction in new development;

- Encourage voluntary efforts to reduce wildfire hazards; and
- Reduce the demands from the public for relief and protection of structures and facilities.

- (2) **Applicability.** This Section shall apply to all development applications and permits within the unincorporated areas of El Paso County. The standards and requirements related to construction in wildland areas are applicable on land that is shown as forested on the Vegetation Map or to areas identified in ~~the a~~ wildland fire risk and hazard mitigation plan, if required by the approval of that plan.
 - (3) **Relationship to Other Standards.** ~~Where a conflict exists between adopted fire district or fire department standards and this Code, the Board of County Commissioners may choose to approve an alternative design which accomplishes the purpose of this section and provides an equivalent benefit to the development. Where a fire department has adopted standards, the more restrictive shall apply. In the case of a conflict between adopted fire district standards and this code, the Fire Marshal~~ Fire Authority should approve provide a recommendation regarding whether the an alternative design which accomplishes the intent of this section and whether it provides an equivalent or similar benefit to the the development property or the community.
 - (4) **Responsibility of Fire Authority.** ~~The Fire Marshal shall have authority to enforce the provisions of this Section. The Fire Marshal shall be authorized to develop and utilize forms and checklists to implement the requirements of this Section. It is the responsibility of the Fire Authority to provide recommendations as to whether a new development meets the applicable fire code standards for the respective area. If a new development does not meet the applicable standards, then the fire authority should provide comments regarding areas of non-compliance and recommendations for achieving compliance.~~
 - (5) **Basis of Standards.** The basis of the standards in this Section is the most current standards adopted by the National Fire Protection Agency (NFPA) and the Colorado State Forest Service (CSFS).
 - (6) **Wildfire Hazard Maps/Vegetation Map.** El Paso County shall maintain a Vegetation Map depicting wildfire hazard areas of the County either based on vegetation type or wildfire hazard analysis, which shall be the official map for the purposes of applying this Section.
- (B) **Reports and Commitments Required for Subdivisions.**
- (1) **Fire Protection Report.** A Fire Protection Report is required for any subdivision application and shall include the fire district's or fire department's Fire Authority's capabilities, including existing and proposed equipment, facilities, services, ~~and~~ response time to provide fire protection for the proposed subdivision, an analysis of compliance with the Fire Protection and Wildfire Mitigation Section of this Code, and an analysis of compliance with the applicable fire code.
 - (2) **Fire Protection Commitment Required.** A written commitment to provide structural fire protection may be required for any proposed subdivision, and the PCD Director may be requested ~~by the Fire Marshal~~ for other development applications.
 - (3) **Mitigation Costs Included in Construction Financial Assurance.** -- If the Board of County Commissioners determines that wildfire mitigation issues are significant enough in the determination of the Fire Marshal to require mitigation associated with development construction activities, the cost of the mitigation shall be included in the construction financial assurance. The Fire aAuthority may, at its discretion, choose to provide a recommendation to the Board of County Commissioners regarding whether the cost

associated with performing wildfire mitigation is appropriate and should be secured and accounted for within the financial assurance estimate and associated collateral for the overall development.

(4) Development Outside Fire District or Fire Department Boundaries. Proposed subdivisions outside the boundaries of a fire district or fire department shall annex into a department or provide evidence of a contract for service from a Fire District or Fire Department. Waivers of this requirement may only be approved by the Board of County Commissioners. An applicant's waiver request shall, at a minimum, include the following:

- A letter from the nearest fire district or fire department demonstrating that annexation is not economically feasible.
- A letter or report from a Third Party Fire Reviewer providing a recommendation to the Board of County Commissioners that the proposed development complies with the Fire Protection and Wildfire Mitigation Section of this Code. In the case of a conflict between adopted standards and this Code, the Third Party Fire Reviewer may recommend an alternative design which accomplishes the purposes of this section and provides an equivalent benefit to the development.

(4) **Plat Notes Required.** Notice of any wildfire mitigation issues or obligations may be required by the County through conditions of approval or notes placed on the face of the plat.

(C) **Design Standards.**

(1) **Water Supply.**

(a) **General.** Water supply systems used for fire protection purposes shall be installed and maintained in accordance with NFPA standards. The required fire flow for one or more buildings of a planned building area (also referred to as the planned building group by the NFPA) shall be determined by the Fire MarshalFire Authority using locally adopted codes, or as specified per the following conditions:

- For areas without municipal-type water systems, NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting, shall be applied.
- For those areas with municipal-type water systems, nationally recognized criteria shall be applied.

(b) **Automatic Fire Protection.**

- (i) ~~Commercial and Industrial Structures. All commercial or industrial structures of more than 3 stories or over 40 feet in height above adjacent ground elevation shall be fully protected with an automatic sprinkler system.~~
- (ii) ~~Multifamily Residential Structures. Any multifamily residential building containing more than 2 dwelling units shall have an automatic sprinkler system installed. Automatic fire protection shall be in compliance with the applicable adopted fire code. If a property is not within an area of the County having an adopted fire code, then the design for automatic fire protection shall be in compliance with the adopted Pikes Peak Regional Building Code.~~

(c) **Areas with Central Water Systems.**

- (i) **Water Distribution System Pressure.** The water distribution system shall be capable of delivering fire flow at a minimum rating of 20 pounds per square inch for each hydrant connected to the distribution system within the proposed subdivision.

- (ii) **Dead-End Mains.** Dead-end mains shall not exceed 600 feet in length for main sizes less than 10 inches in diameter.
 - (iii) **Fire Hydrant Spacing.** Fire hydrants shall be located so that all residential structures are within 500 feet and all nonresidential structures are within 150 feet of a hydrant. Fire hydrants shall be installed adjacent to a road or emergency vehicle lane at a spacing not to exceed 660 feet of vehicle travel distance. Where the proposed buildings warrant, the ~~Fire Marshal~~Fire Authority may ~~require recommend additional hydrants and closer spacing a greater spacing distance or require additional hydrants and closer spacing based upon the applicable Fire Code or NFPA standards.~~
 - (iv) **Fire Hydrant Accessibility.** Fire hydrants shall be accessible to fire district or fire department apparatus from a road (i.e., maintained public roads, privately-maintained roads, or emergency vehicle access roads) or unobstructed emergency vehicle lanes (i.e., driveway, parking drive aisle, or emergency vehicle lane).
 - (v) **Fire Hydrant Supply Lines.** Fire hydrants shall be supplied by not less than a 6 inch diameter main installed on a looped system, or by not less than an 8 inch diameter main if the system is not looped or the fire hydrant is installed on a dead-end main exceeding 300 feet in length.
 - (vi) **Fire Hydrants in Parking Areas.** Fire hydrants located in parking areas shall be protected by barriers that will prevent physical damage from vehicles without obstructing hydrant operation.
 - (vii) **Fire Hydrant Relationship to Roads.** Fire hydrants shall be located within 6 feet of the edge of the pavement unless there is a conflict with the ECM or the ~~Fire Marshal~~Fire Authority determines-recommends another location is more acceptable for fire district or fire department use. All roads and emergency vehicle lanes shall be designed to maintain a minimum unobstructed clearance of 3 feet around fire hydrants.
 - (viii) **Fire Hydrant Easements.** Easements for fire hydrants shall be provided and dedicated to the appropriate fire or water authority when the hydrants are not within a public road right-of-way. The easement shall afford accessibility to the hydrant from the right-of-way.
 - (ix) **Release of Financial Assurance for Water Supply Systems.** The contractor, installer, or owner of water supply systems shall demonstrate by testing that the capacity of the water supply system will meet fire protection design requirements prior to release of construction financial assurance for the system. The testing shall be certified by a qualified professional. The tests ~~shall~~may be provided to the ~~Fire Marshal~~Fire Authority if requested.
- (d) **Areas without Central Water Systems.**
- (i) **Fire Cisterns.**
 - **Fire Cisterns Required:** Fire cisterns shall be provided in planned building areas which are not served by hydrants, unless the ~~Fire Marshal~~Fire Authority has recommended and the approval authority has approved an alternative fire protection water supply system.
 - **Construction Standards:** Construction of fire cisterns shall be in accordance with the approved plans and conform to the requirements of the NFPA standard on water supplies for suburban and rural fire fighting.

- Design Standards for Subdivisions with More than One Cistern: For subdivisions where more than one fire cistern is required, fire cisterns shall meet the requirements of the NFPA standards for water supplies for suburban and rural fire fighting. For this type of subdivision, fire cisterns shall be designed for the largest building allowed by zoning in the worst case hazard and construction class.

- Design Standards for Subdivisions with One Cistern: For subdivisions where only one fire cistern is required, the minimum capacity of the fire cistern shall meet the requirements of the NFPA standards on water supplies for suburban and rural fire fighting, or shall have a total capacity equal to 300 gallons for each acre within the subdivision plus 3,000 gallons per dwelling unit, whichever is greater.

- Cistern Turnaround: A dedicated turnaround shall be placed no more than 50 feet from a fire cistern, and the standpipe shall be within 8 feet of the nearest usable portion of the dedicated right-of-way or approved easement, unless otherwise ~~recommended approved~~ by the applicable ~~Fire Marshal~~Fire Authority and approved by the approval authority.

- Easements Required: Fire cistern easements shall be provided and dedicated to the appropriate fire department to afford accessibility of the cistern from a public road. Easements shall be of sufficient size to facilitate maintenance.

(ii) Dry Hydrants.

- Use of Dry Hydrants: Dry hydrants may be provided in combination with fire cisterns or other approved fire protection water supply systems. Plans for dry hydrants shall be submitted to ~~and approved by the Fire Marshal~~the Fire Authority for recommendation and approved by the approval authority.

- Construction Standards: Construction and installation of dry hydrants shall be in accordance with the approved plans and conform to the requirements of the NFPA standards on water supplies for suburban and rural fire fighting.

- Accessible: Dry hydrants shall be located to be accessible under all weather conditions.

- Clearance: Dry hydrants shall have a minimum clearance of 20 feet on each side and be located a minimum of 100 feet from any structure. Highway or road traffic shall not be impaired during the use of the dry hydrant.

- Protected: Dry hydrants shall be protected from damage by vehicular and other perils, including freezing and damage from ice and other objects.

- Visible: Dry hydrant locations shall be made visible from the main roadway during emergencies by reflective marking and signage ~~approved by the Fire Marshal~~ and shall be in conformance with the NFPA requirements. All identification signs shall be approved by the highway authority prior to installation if they are to be located on the right-of-way or are subject to State laws.

- Access to Hydrant: Vehicle access shall be designed and constructed to support the heaviest vehicle.

- Maintenance of Dry Hydrant: Dry hydrants shall be checked and maintained at least quarterly. Thorough surveys shall be conducted, to reveal any deterioration in the water supply situation in ponds, streams, or cisterns. Grass, brush, and other vegetation shall be kept trimmed and neat. Vegetation shall be cleared for a minimum 3 foot radius from around hydrants. The hydrant shall be painted as needed, with reflective material to maintain visibility during emergencies. The ~~Fire Authority may make a recommendation regarding the ownership and maintenance responsibilities for the facilities per the NFPA 1142 Standards. The approval authority will approve the ownership and maintenance responsibilities for the facilities shall be approved by the Fire Marshal.~~

- Maps and Location/Detail Drawings: The ~~fire department (Fire Marshal Fire Authority and El Paso County Sheriff's Office where there is no fire department)~~ shall maintain in a safe location, the maps and records of dry hydrant system locations, installation, tests, inspections, maintenance and repairs. When the property is not within a Fire Protection District it is the responsibility of the property owner and El Paso County Sheriff's Office to maintain in a safe location, the maps and records of dry hydrant system locations, installation, tests, inspections, maintenance and repairs.

- Easements Required: Dry hydrant easements shall be provided and dedicated to the appropriate fire department (or County where there is no fire department) to afford accessibility of the dry hydrant from a public road. Easements shall be of sufficient size to facilitate maintenance.

(iii) Water Supply Requirements. The owner of the cistern or dry hydrant is responsible for planning, developing, permitting, and continual provision of a sufficient water supply necessary to maintain the fire protection requirements of a cistern system, to the satisfaction of the ~~Fire approval authority Marshal~~ with recommendation by the Fire Authority.

(2) **Roads.** This Section shall apply to all roads providing access to a planned building area whether or not they are dedicated as public roads.

(a) **Roads Constructed to County Standards.** All roads, including private roads and emergency vehicle access roads, shall be designed and constructed according to this Code and the ECM. Emergency vehicle access roads shall, at a minimum, be constructed to the County's gravel road standard if open to the public. Emergency

vehicle access roads which are not open to public travel shall meet the non-road access standards

- (b) **Roads within 150 Feet of Development.** Roads or emergency vehicle lanes shall be provided within 150 feet of all development except single family residential development.
 - (c) **Two Access Routes Required.** Access to a planned building area shall be provided by a minimum of 2 separate routes in accordance with the requirements of this Code and the ECM if the cul-de-sac exceeds the length allowed by the ECM.
 - (d) **Turnaround Required on Dead-End Roads.** Every dead-end road more than 300 feet in length shall be provided with a roadway termination meeting ECM standards.
 - (e) **Road Grades in Wildland Fire Areas.** Within wildland fire areas, road grades steeper than 10 percent may be permitted where the Fire Authority and ECM Administrator recommend that the mitigation measures can be agreed on by the Fire Marshal and the ECM Administrator.
- (3) **Non-Road Access.** The following minimum standards shall apply to emergency vehicle lanes, driveways, and parking lot drive lanes serving as emergency vehicle lanes.
- (a) **Emergency Access Provided.** Access for emergency responders, ingress, egress, and evacuation shall be provided for all buildings.
 - (b) **Driveways Required.** Where any point of a building is greater than 150 feet from a road, a driveway meeting these standards shall be provided to within 150 feet of the furthest point on the building.
 - (c) **Emergency Vehicle Lanes Required.** The Fire Authority may recommend emergency vehicle lanes be provided. Emergency vehicle lanes shall be provided as required by the Fire approval authority ~~Fire Marshal~~.
 - (d) **Emergency Access Lane Design.** An emergency vehicle lane shall be designed and constructed to enable fire-fighting apparatus to maneuver broadside or directly forward within a minimum of 5 feet and a maximum of 25 feet of structures.
 - (e) **Width of Driveway and Emergency Vehicle Lanes.** Where the driveway is greater than 150 feet in length, it shall be not less than 10 feet in unobstructed width. Emergency vehicle lanes providing one-way travel shall be a minimum of 16 feet in width, and fire lanes with two-way travel shall be a minimum of 24 feet in width.
 - (f) **Vertical Clearance.** At least 13 feet 6 inches of vertical clearance shall be provided and maintained over the full width of an emergency vehicle lane or driveway.
 - (g) **Turns.** Required driveways shall be designed, constructed, and maintained to accommodate the turning radius of the largest apparatus typically used to respond to that location. A turn in an emergency vehicle lane shall be constructed with a minimum radius of 25 feet at the inside curb line and a minimum radius of 50 feet at the outside curb line.
 - (h) **Grades.** Road grades steeper than 10 percent may be permitted where the Fire Authority and ECM Administrator recommend that the mitigation measures are adequate and the approval authority approves the mitigation measurements. ~~Emergency vehicle lanes and required driveways shall not exceed 10 percent in grade unless steeper grades are allowed where mitigation measures can be agreed on by the Fire Marshal and the property owner.~~
 - (i) **Emergency Vehicle Lanes Connecting to Roads.** Emergency vehicle lanes connecting to roads shall be provided with curb cuts extending at least 2 feet beyond each edge of the fire lane.

- (j) **Turnouts and Turnarounds Required.**
 - (i) Driveways. Where the required driveway is greater than 300 feet, it shall be provided with turnouts or turnarounds at locations approved by the ~~Fire Marshal~~approval authority with recommendation from the Fire Authority.
 - (ii) Turnarounds Required. The fire authority may provide a recommendation regarding turnarounds. Dead-end emergency vehicle lanes in excess of 300 feet in length shall be provided with turnouts and turnarounds as approved by the ~~Fire Marshal~~approval authority. The turnaround at the terminus shall have a minimum radius of 50 feet. The ~~Fire Marshal~~approval authority shall be authorized to approve, as an alternative, a "hammerhead" turnaround to provide emergency vehicles with a three-point turnaround.
 - (k) **Load Design.** Emergency vehicle lanes and required driveways shall be designed, constructed, and maintained to accommodate the load of the largest apparatus typically used to respond to that location.
 - (l) **Bridges or Drainage Crossings.** A bridge or drainage crossing on an emergency vehicle lane or required driveway shall be designed to accommodate the load of the largest apparatus typically used to respond to that location. The load limit shall be clearly posted at the approaches to the bridge.
 - (m) **Landscaping Maintained.** Landscaping or other obstructions shall be maintained in a manner that provides unobstructed access for fire department operations.
- (4) **Gates.**
- (a) **Gate Location and Dimensions.** Gates shall be located a minimum of 30 feet from the public right-of-way and shall not open outward. The opening provided through a gate shall be 2 feet wider than the traveled way.
 - (b) **Locks.** Fire department personnel shall have ready access to locking mechanisms on a gate restricting access to a fire line. Proposed changes to access shall be approved by the ~~Fire Marshal~~Fire Authority.
- (D) **Construction in Wildland Fire Areas.**
- (1) **General.**
- (a) **Applicability.** All structures potentially threatened by wildland fire shall be designed, located, and constructed to comply with this Section.
 - (b) **Risk Assessment Required.** A wildland fire risk and hazard severity assessment shall be performed for all structures and groups of structures adjacent to wildland fuels.
 - (c) **Maintenance of Property.** After construction, continued maintenance of the grounds and storage of combustible materials shall be performed to maintain these requirements, ~~as acceptable to the Fire Marshal~~.
 - (d) **Location of Buildings and Building Envelopes.** Buildings located closer than 30 feet to a vegetated slope shall require special mitigation measures in accordance with NFPA 1144, Standard for Protection of Life and Property from Wildfire ~~as determined by the Fire Marshal~~. Building envelopes shall not include gullies, fire chimneys, saddles, or other terrain conducive to wildfire spread.
 - (e) **Roof Design and Materials.** Only roof covering assemblies rated Class A shall be used in a wildland area. The specific class shall be consistent with the wildland fire risk and hazard severity assessment ~~as determined by the Fire Marshal~~.
 - (f) **Accessory Structures.** Outbuildings, patio covers, gazebos, and other accessory structures shall be separated from the main structure by a minimum of 30 feet.

- (g) **Access to Structures.** At least one approved means of vehicular access shall be provided to each structure or other nonstructural fire hazard in accordance with the following:
 - (i) For structures or nonstructural fire hazards exceeding two stories or 30 feet in height above average adjacent ground level, or 12,000 square feet of gross floor area, no less than 2 separate approved means of access shall be provided.
 - (ii) Approved vehicular access shall be provided to within 150 ft of any point of the exterior wall of each structure.
 - (h) **Access to Structures Not Protected by Automatic Sprinklers.** An approved means of vehicular access shall be provided to within 30 feet of all points of at least 2 exterior walls for any structure not protected by automatic sprinklers that exceeds 2 stories or 30 feet in height above average adjacent ground elevation. Single and two-family dwellings are exempt from this requirement.
 - (i) **Access to Structures Protected by Automatic Sprinklers.** For any structure protected by an automatic sprinkler system, an approved means of vehicular access shall be provided to within 400 feet of any point of the exterior wall. For any structure exceeding 3 stories or 35 feet in height above average adjacent ground elevation and protected by an automatic sprinkler system, an approved means of vehicular access shall be provided to within 30 feet of all points of at least 2 exterior walls.
 - (j) **Separation Between Structures.** A structure in a planned building area shall be separated from another structure by at least 30 feet and shall be located at least 25 feet from a lot, parcel, or tract line. A structure in a planned building area that exceeds 2 stories or 30 feet in height above average adjacent ground elevation and is not protected by an automatic sprinkler system shall be separated from other structures by at least 50 feet and shall be located at least 25 feet from a lot, parcel, or tract line.
- (2) **Wildland Fire and Hazard Mitigation Plan Required.**
- (a) **General Plan Standards and Requirements.**

When a subject lot, parcel, or tract falls within a wildland fire area, a wildland fire risk and hazard mitigation plan shall be prepared by a qualified professional and shall be tailored to the stage of development application and the stage of subdivision-related construction. A higher level of plan may be submitted at any stage of the process so long as it is implemented at the final stage of development. Plans shall utilize the Colorado State University (CSU) Guidelines and NFPA standards, as applicable. Additional fire precaution measures may be required because of fire hazard in the following areas:

 - (i) Areas depicted as forested on the Vegetation Map;
 - (ii) Areas rated as fire hazards by the CSFS;
 - (iii) Where slopes in or adjacent to proposed development are in excess of 20%; or
 - (iv) Where the local fire protection agency identifies a specific fire danger.
 - (b) **Development of Plan.**
 - (i) **General Mitigation Plan Requirements.** This plan shall include, but not be limited to, the following:
 - Access, ingress, egress, and evacuation;
 - Fuel modification;

- Water supply;
- Construction, location, and design of structures; and
- Ignition potential.

- (ii) Approval of ~~Fire Marshal~~Wildland Fire and Hazard Mitigation Plan. The ~~Fire Marshal~~Approval Authority shall approve the mitigating measures relative to access, defensible space, water supply, and construction based on the relative risk and hazard rating.

(3) **Wildland Fire Risk and Hazard Severity Analysis Required.**

- (a) **Risk Assessment to be Performed.** A risk and hazard rating analysis shall be performed to determine the level of the wildland fire threat to life and values at risk prior to building permit authorization in high hazard areas unless completed as part of the wildland fire and hazard mitigation plan.
- (b) **Basis for Mitigation Measures.** The risk and hazard ratings shall be the basis for the implementation of mitigation measures relative to vegetation, other combustibles, and construction criteria.
- (c) **Analysis Rating Factors.** The following shall be considered in analyzing the risk factors:

- The history of local wind, relative humidity, temperature, and fine fuel moisture content shall be considered in determining defensible space.
- All vegetative fuels and other combustible materials shall be evaluated for their potential to contribute to the intensity and spread of wildland fire.
- Slope and aspect shall be evaluated as to their potential to increase the threat of wildland fire to life or improved lot, parcel, or tract.
- The factors determining required defensible space shall include the history of wildland fire for the area.
- Fire-safe routes for emergency service apparatus and for egress shall be evaluated.
- Other factors that can affect the risk of ignition or the spread of wildland fire on improved lot, parcel, or tract, including the risk of structure fires spreading to vegetation, shall be part of the analysis.

- (d) **Recommendationview of Wildland Fire Risk and Hazard Rating.** The rating assignments developed to meet the requirements of this Code ~~shall~~may be reviewed by the ~~Fire Marshal~~Fire Authority who may provide a recommendation regarding the rating.

- (4) **No Permit or Approval Granted without Compliance.** No permit or approval associated with development, construction or occupancy shall be approved or issued until the provisions of this standard are satisfied. Notwithstanding the foregoing, the ~~Fire Marshal~~Planning and Community Development Director shall have the authority to grant

administrative variances to the design standards of this Section upon the finding of two or more of the following criteria:

- The fire ~~district or fire protection district~~ authority responsible for providing fire protection services, as applicable, to the project has adopted a fire code with a more stringent design standard from that contained herein;
- The application of a design standard will cause undue hardship or practical exceptional difficulties; or
- An alternate design standard will satisfy the intent and meet the goals of these Fire Protection and Wildfire Mitigation Regulations.

(5) **Defensible Space Requirements.**

- (a) **General.** The Defensible Space Requirements in Table 6.8 shall be implemented as minimum requirements in association with development in any Wildland Fire Area.

Table 6-8. Defensible Space Clearing and Structural Summary (Recommendations from NFPA by Wildland Fire Hazard Severity Analysis)

Low Hazard	High Hazard
9.14 m (30 ft) clearance. Class A roof. No portion of trees or other vegetation within 3.048 m (10 ft) of chimney outlets. Trees within defensible space shall be pruned to minimize ladder fuels.	9.14 m (30 ft) irrigated. Class A roof. 30.48 m (100 ft) fuel treatment. Noncombustible siding/decks, and boxed eaves. Selected fire-resistant trees within 9.1 m (30 ft) of structures. Selected thinning of trees and shrubs. Trees within defensible space shall be pruned to minimize ladder fuels. All trees and shrubs pruned of dead material. No portion of trees or other vegetation within 3.48 m (10 ft) of chimney outlets.

- (b) **Maintenance of Defensible Space and Associated Fuel Break Thinning.** Defensible space and fuel break thinning work shall be completed and maintained to the standards described in the Colorado State University's Cooperative Extension Fact Sheet 6.302. The responsibility for maintaining defensible space and associated fuel break thinning lies with the landowner. Noncompliance with defensible space maintenance standards will be enforced as a zoning violation.

(6) **Fuels Modification During Development and After Construction.**

(a) **Identification of Modification Required.** Identification of fuel modification measures may be required in order to reduce the threat of wildfire. If fuel modification is determined to be necessary, the plan shall be prepared by a qualified professional. A fuel modification plan shall comply with NFPA requirements. Required elements shall include but are not limited to the following:

- Identification of fuel type, volume and loading, in conjunction with an assessment of slope and aspect, to determine the ability for a wildfire to spread;
- Reduction of fuel loading and modification of fuel types to reduce the risk to structures or adjacent vegetation, including the creation of fuel breaks; and
- Creation of defensible space to protect structures from approaching wildfire and reduce the potential for turning a structure fire into a wildfire.

(b) **Fuel Modification Standards.** When the Wildland Fire Risk and Hazard Mitigation Plan requires establishment of a fuel modification area:

- The modifications shall extend at least 30 feet from structures;
- Ground fuels within the defined defensible space shall be treated or removed;
- Live vegetation within the defensible space shall have dead material removed and shall be thinned and pruned;
- Dead or downed fuels within the defensible space of buildings shall be removed or treated to maintain the fuel modification area;
- Vegetation under trees within the fuel modification area shall be maintained at a height that will preclude ground fire from spreading in the tree crown;
- The fuel modification plan shall include a maintenance element with the responsibility for maintenance defined;
- In these areas all slash (fallen trees, shrubs, pulled stumps, and other combustible materials) may be required to be disposed of from an area extending to at least 150 feet from the road centerline prior to the acceptance of any roads;
- All slash shall also be removed from the vicinity of the home sites prior to final building inspection; and
- Continuous proper forest management to maintain a low wildfire danger shall be guaranteed.

(7) **Combustible Materials.** Propane tanks and other combustible liquids storage shall conform to NFPA 30, Flammable and Combustible Liquids Code, NFPA 58, Liquefied Petroleum Gas Code, and the Wildland Fire Risk and Hazard Mitigation Plan. Other

combustible materials shall be removed from the defensible space or stored in conformance with the fire protection plan ~~as approved by the Fire Marshal.~~

Replace "Fire Marshal" with "Fire Authority" throughout.

Fire Authority — **For purposes of this Code, the person designated by the Fire District or Fire Department within whose boundaries the property lies. This term shall also include a Third-Party Fire Reviewer for properties not located within the boundaries of a Fire District or Fire Department.**

Third Party Fire Reviewer- a person with a minimum of an State of Colorado Inspector II, ICC or NFPA Certification who has provided El Paso County with a copy of such certification and who has self-certified that they are qualified to provide comment and recommendations.

Fireworks Sales

(A)

Sales Period Limited. Fireworks sales are limited to the period from May 31 to July 6th each year. Firework sales is prohibited if the Sherriff has implemented a fire ban.

(B)

Fire Authority Approval Required. Fire Authority approval is required prior to the approval of a temporary use permit.

(C)

Driveway Permit Required. A driveway permit shall be issued to allow access to the fireworks sales area prior to the approval of a temporary use permit.

(D)

Required Signage. A fireworks sales area shall post signage noting it is illegal to shoot fireworks within all towns and cities in El Paso County and violators will be prosecuted. Each fireworks sales area shall provide either one sign, with minimum 3 inch letter size, or 4 signs of 8½ by 11 inches, placed in a conspicuous location easily readable by the public, noting the language as stated or similar language approved by the PCD Director.

6.3.3. Fire Protection and Wildfire Mitigation

(A) General.

- (1) **Purpose and Intent.** To ensure that proposed development is reviewed in consideration of the wildfire risks and need to provide adequate fire protection in order to:

- Regulate development, buildings, and structures so as to minimize the hazard to public health, safety, and welfare;
- Ensure that adequate fire protection is available for new development;
- Implement wildfire hazard reduction in new development;

- Encourage voluntary efforts to reduce wildfire hazards; and
 - Reduce the demands from the public for relief and protection of structures and facilities.
- (2) **Applicability.** This Section shall apply to all development applications and permits within the unincorporated areas of El Paso County. The standards and requirements related to construction in wildland areas are applicable on land that is shown as forested on the Vegetation Map or to areas identified in a wildland fire risk and hazard mitigation plan, if required by the approval of that plan.
 - (3) **Relationship to Other Standards.** Where a conflict exists between adopted fire district or fire department standards and this Code, the Board of County Commissioners may choose to approve an alternative design which accomplishes the purpose of this section and provides an equivalent benefit to the development. The Fire Authority should provide a recommendation regarding whether the alternative design accomplishes the intent of this section and whether it provides an equivalent benefit to the development.
 - (4) **Responsibility of Fire Authority.** It is the responsibility of the Fire Authority to provide recommendations as to whether a new development meets the applicable fire code standards for the respective area. If a new development does not meet the applicable standards, then the fire authority should provide comments regarding areas of non-compliance and recommendations for achieving compliance.
 - (5) **Basis of Standards.** The basis of the standards in this Section is the most current standards adopted by the National Fire Protection Agency (NFPA) and the Colorado State Forest Service (CSFS).
 - (6) **Wildfire Hazard Maps/Vegetation Map.** El Paso County shall maintain a Vegetation Map depicting wildfire hazard areas of the County either based on vegetation type or wildfire hazard analysis, which shall be the official map for the purposes of applying this Section.
- (B) **Reports and Commitments for Subdivisions.**
- (1) **Fire Protection Report.** A Fire Protection Report is required for any subdivision application and shall include the Fire Authority's capabilities, including existing and proposed equipment, facilities, services, response time to provide fire protection for the proposed subdivision, an analysis of compliance with the Fire Protection and Wildfire Mitigation Section of this Code, and an analysis of compliance with the applicable fire code.
 - (2) **Fire Protection Commitment.** A written commitment to provide structural fire protection may be required for any proposed subdivision and the PCD Director may be requested for other development applications.
 - (3) **Mitigation Costs Included in Construction Financial Assurance.** If the Board of County Commissioners determines that wildfire mitigation issues are significant enough to require mitigation associated with development construction activities, the cost of the mitigation shall be included in the construction financial assurance. The Fire Authority may, at its discretion, choose to provide a recommendation to the Board of County Commissioners regarding whether the cost associated with performing wildfire mitigation is appropriate and should be secured and accounted for within the financial assurance estimate and associated collateral for the overall development.
 - (4) **Development Outside Fire District or Fire Department Boundaries.** Proposed subdivisions outside the boundaries of a fire district or fire department shall annex into a department or provide evidence of a contract for service from a Fire District or Fire Department. Waivers of this requirement may only be approved by the Board of County Commissioners. An applicant's waiver request shall, at a minimum, include the following:

- A letter from the nearest fire district or fire department demonstrating that annexation is not economically feasible.
 - A letter or report from a Third Party Fire Reviewer providing a recommendation to the Board of County Commissioners that the proposed development complies with the Fire Protection and Wildfire Mitigation Section of this Code. In the case of a conflict between adopted standards and this Code, the Third Party Fire Reviewer may recommend an alternative design which accomplishes the purposes of this section and provides an equivalent benefit to the development.
- (4) **Plat Notes Required.** Notice of any wildfire mitigation issues or obligations may be required by the County through conditions of approval or notes placed on the face of the plat.

(C) **Design Standards.**

(1) **Water Supply.**

- (a) **General.** Water supply systems used for fire protection purposes shall be installed and maintained in accordance with NFPA standards. The required fire flow for one or more buildings of a planned building area (also referred to as the planned building group by the NFPA) shall be determined by the Fire Authority using locally adopted codes, or as specified per the following conditions:

- For areas without municipal-type water systems, NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting, shall be applied.

- For those areas with municipal-type water systems, nationally recognized criteria shall be applied.

(b) **Automatic Fire Protection.**

- (i) Automatic fire protection shall be in compliance with the applicable adopted fire code. If a property is not within an area of the County having an adopted fire code, then the design for automatic fire protection shall be in compliance with the adopted Pikes Peak Regional Building Code.

(c) **Areas with Central Water Systems.**

- (i) **Water Distribution System Pressure.** The water distribution system shall be capable of delivering fire flow at a minimum rating of 20 pounds per square inch for each hydrant connected to the distribution system within the proposed subdivision.
- (ii) **Dead-End Mains.** Dead-end mains shall not exceed 600 feet in length for main sizes less than 10 inches in diameter.
- (iii) **Fire Hydrant Spacing.** Fire hydrants shall be located so that all residential structures are within 500 feet and all nonresidential structures are within 150 feet of a hydrant. Fire hydrants shall be installed adjacent to a road or emergency vehicle lane at a spacing not to exceed 660 feet of vehicle travel distance. Where the proposed buildings warrant, the Fire Authority may recommend a greater spacing distance or require additional hydrants and closer spacing based upon the applicable Fire Code or NFPA standards.
- (iv) **Fire Hydrant Accessibility.** Fire hydrants shall be accessible to fire district or fire department apparatus from a road (i.e., maintained public roads, privately-maintained roads, or emergency vehicle access roads) or unobstructed emergency vehicle lanes (i.e., driveway, parking drive aisle, or emergency vehicle lane).

- (v) **Fire Hydrant Supply Lines.** Fire hydrants shall be supplied by not less than a 6 inch diameter main installed on a looped system, or by not less than an 8 inch diameter main if the system is not looped or the fire hydrant is installed on a dead-end main exceeding 300 feet in length.
- (vi) **Fire Hydrants in Parking Areas.** Fire hydrants located in parking areas shall be protected by barriers that will prevent physical damage from vehicles without obstructing hydrant operation.
- (vii) **Fire Hydrant Relationship to Roads.** Fire hydrants shall be located within 6 feet of the edge of the pavement unless there is a conflict with the ECM or the Fire Authority recommends another location is more acceptable for fire district or fire department use. All roads and emergency vehicle lanes shall be designed to maintain a minimum unobstructed clearance of 3 feet around fire hydrants.
- (viii) **Fire Hydrant Easements.** Easements for fire hydrants shall be provided and dedicated to the appropriate fire or water authority when the hydrants are not within a public road right-of-way. The easement shall afford accessibility to the hydrant from the right-of-way.
- (ix) **Release of Financial Assurance for Water Supply Systems.** The contractor, installer, or owner of water supply systems shall demonstrate by testing that the capacity of the water supply system will meet fire protection design requirements prior to release of construction financial assurance for the system. The testing shall be certified by a qualified professional. The tests may be provided to the Fire Authority if requested.

(d) **Areas without Central Water Systems.**

(i) **Fire Cisterns.**

- **Fire Cisterns Required:** Fire cisterns shall be provided in planned building areas which are not served by hydrants, unless the Fire Authority has recommended and the approval authority has approved an alternative fire protection water supply system.
- **Construction Standards:** Construction of fire cisterns shall be in accordance with the approved plans and conform to the requirements of the NFPA standard on water supplies for suburban and rural fire fighting.
- **Design Standards for Subdivisions with More than One Cistern:** For subdivisions where more than one fire cistern is required, fire cisterns shall meet the requirements of the NFPA standards for water supplies for suburban and rural fire fighting. For this type of subdivision, fire cisterns shall be designed for the largest building allowed by zoning in the worst case hazard and construction class.
- **Design Standards for Subdivisions with One Cistern:** For subdivisions where only one fire cistern is required, the minimum capacity of the fire cistern shall meet the requirements of the NFPA standards on water supplies for suburban and rural fire fighting, or shall have a total capacity equal to 300 gallons for each acre within the subdivision plus 3,000 gallons per dwelling unit, whichever is greater.
- **Cistern Turnaround:** A dedicated turnaround shall be placed no more than 50 feet from a fire cistern, and the standpipe shall be within 8 feet of the nearest usable portion of the dedicated

right-of-way or approved easement, unless otherwise recommended by the applicable Fire Authority and approved by the approval authority.

- **Easements Required:** Fire cistern easements shall be provided and dedicated to the appropriate fire department to afford accessibility of the cistern from a public road. Easements shall be of sufficient size to facilitate maintenance.

(ii) Dry Hydrants.

- **Use of Dry Hydrants:** Dry hydrants may be provided in combination with fire cisterns or other approved fire protection water supply systems. Plans for dry hydrants shall be submitted to the Fire Authority for recommendation and approved by the approval authority.

- **Construction Standards:** Construction and installation of dry hydrants shall be in accordance with the approved plans and conform to the requirements of the NFPA standards on water supplies for suburban and rural fire fighting.

- **Accessible:** Dry hydrants shall be located to be accessible under all weather conditions.

- **Clearance:** Dry hydrants shall have a minimum clearance of 20 feet on each side and be located a minimum of 100 feet from any structure. Highway or road traffic shall not be impaired during the use of the dry hydrant.

- **Protected:** Dry hydrants shall be protected from damage by vehicular and other perils, including freezing and damage from ice and other objects.

- **Visible:** Dry hydrant locations shall be made visible from the main roadway during emergencies by reflective marking and signage and shall be in conformance with the NFPA requirements. All identification signs shall be approved by the highway authority prior to installation if they are to be located on the right-of-way or are subject to State laws.

- **Access to Hydrant:** Vehicle access shall be designed and constructed to support the heaviest vehicle.

- **Maintenance of Dry Hydrant:** Dry hydrants shall be checked and maintained at least quarterly. Thorough surveys shall be conducted, to reveal any deterioration in the water supply situation in ponds, streams, or cisterns. Grass, brush, and other vegetation shall be kept trimmed and neat. Vegetation shall be cleared for a minimum 3 foot radius from around hydrants. The hydrant shall be painted as needed, with reflective material to maintain visibility during emergencies. The Fire Authority may make a recommendation regarding the ownership and maintenance responsibilities for the facilities per the NFPA 1142 Standards. The approval authority will approve the ownership and maintenance responsibilities for the facilities.

- **Maps and Location/Detail Drawings:** The Fire Authority and El Paso County Sheriff's Office shall maintain in a safe location, the maps and records of dry hydrant system locations, installation, tests, inspections, maintenance and repairs. When the property is not within a Fire

Protection District it is the responsibility of the property owner and El Paso County Sheriff's Office to maintain in a safe location, the maps and records of dry hydrant system locations, installation, tests, inspections, maintenance and repairs.

- **Easements Required:** Dry hydrant easements shall be provided and dedicated to the appropriate fire department (or County where there is no fire department) to afford accessibility of the dry hydrant from a public road. Easements shall be of sufficient size to facilitate maintenance.

- (iii) **Water Supply Requirements.** The owner of the cistern or dry hydrant is responsible for planning, developing, permitting, and continual provision of a sufficient water supply necessary to maintain the fire protection requirements of a cistern system, to the satisfaction of the approval authority with recommendation by the Fire Authority.

- (2) **Roads.** This Section shall apply to all roads providing access to a planned building area whether or not they are dedicated as public roads.

- (a) **Roads Constructed to County Standards.** All roads, including private roads and emergency vehicle access roads, shall be designed and constructed according to this Code and the ECM. Emergency vehicle access roads shall, at a minimum, be constructed to the County's gravel road standard if open to the public. Emergency vehicle access roads which are not open to public travel shall meet the non-road access standards

- (b) **Roads within 150 Feet of Development.** Roads or emergency vehicle lanes shall be provided within 150 feet of all development except single family residential development.

- (c) **Two Access Routes Required.** Access to a planned building area shall be provided by a minimum of 2 separate routes in accordance with the requirements of this Code and the ECM if the cul-de-sac exceeds the length allowed by the ECM.

- (d) **Turnaround Required on Dead-End Roads.** Every dead-end road more than 300 feet in length shall be provided with a roadway termination meeting ECM standards.

- (e) **Road Grades in Wildland Fire Areas.** Within wildland fire areas, road grades steeper than 10 percent may be permitted where the Fire Authority and ECM Administrator recommend that the mitigation measures are adequate and the approval authority approves the mitigation measures.

- (3) **Non-Road Access.** The following minimum standards shall apply to emergency vehicle lanes, driveways, and parking lot drive lanes serving as emergency vehicle lanes.

- (a) **Emergency Access Provided.** Access for emergency responders, ingress, egress, and evacuation shall be provided for all buildings.

- (b) **Driveways Required.** Where any point of a building is greater than 150 feet from a road, a driveway meeting these standards shall be provided to within 150 feet of the furthest point on the building.

- (c) **Emergency Vehicle Lanes Required.** The Fire Authority may recommend emergency vehicle lanes be provided. Emergency vehicle lanes shall be provided as required by the approval authority.

- (d) **Emergency Access Lane Design.** An emergency vehicle lane shall be designed and constructed to enable fire-fighting apparatus to maneuver broadside or directly forward within a minimum of 5 feet and a maximum of 25 feet of structures.

- (e) **Width of Driveway and Emergency Vehicle Lanes.** Where the driveway is greater than 150 feet in length, it shall be not less than 10 feet in unobstructed width. Emergency vehicle lanes providing one-way travel shall be a minimum of 16 feet in width, and fire lanes with two-way travel shall be a minimum of 24 feet in width.
 - (f) **Vertical Clearance.** At least 13 feet 6 inches of vertical clearance shall be provided and maintained over the full width of an emergency vehicle lane or driveway.
 - (g) **Turns.** Required driveways shall be designed, constructed, and maintained to accommodate the turning radius of the largest apparatus typically used to respond to that location. A turn in an emergency vehicle lane shall be constructed with a minimum radius of 25 feet at the inside curb line and a minimum radius of 50 feet at the outside curb line.
 - (h) **Grades.** Road grades steeper than 10 percent may be permitted where the Fire Authority and ECM Administrator recommend that the mitigation measures are adequate and the approval authority approves the mitigation measures. (i) **Emergency Vehicle Lanes Connecting to Roads.** Emergency vehicle lanes connecting to roads shall be provided with curb cuts extending at least 2 feet beyond each edge of the fire lane.
 - (j) **Turnouts and Turnarounds Required.**
 - (i) Driveways. Where the required driveway is greater than 300 feet, it shall be provided with turnouts or turnarounds at locations approved by the approval authority with recommendation from the Fire Authority.
 - (ii) Turnarounds Required. The fire authority may provide a recommendation regarding turnarounds. Dead-end emergency vehicle lanes in excess of 300 feet in length shall be provided with turnouts and turnarounds as approved by the approval authority. The turnaround at the terminus shall have a minimum radius of 50 feet. The approval authority shall be authorized to approve, as an alternative, a "hammerhead" turnaround to provide emergency vehicles with a three-point turnaround.
 - (k) **Load Design.** Emergency vehicle lanes and required driveways shall be designed, constructed, and maintained to accommodate the load of the largest apparatus typically used to respond to that location.
 - (l) **Bridges or Drainage Crossings.** A bridge or drainage crossing on an emergency vehicle lane or required driveway shall be designed to accommodate the load of the largest apparatus typically used to respond to that location. The load limit shall be clearly posted at the approaches to the bridge.
 - (m) **Landscaping Maintained.** Landscaping or other obstructions shall be maintained in a manner that provides unobstructed access for fire department operations.
- (4) **Gates.**
- (a) **Gate Location and Dimensions.** Gates shall be located a minimum of 30 feet from the public right-of-way and shall not open outward. The opening provided through a gate shall be 2 feet wider than the traveled way.
 - (b) **Locks.** Fire department personnel shall have ready access to locking mechanisms on a gate restricting access to a fire line. Proposed changes to access shall be approved by the Fire Authority.
- (D) **Construction in Wildland Fire Areas.**
- (1) **General.**
 - (a) **Applicability.** All structures potentially threatened by wildland fire shall be designed, located, and constructed to comply with this Section.

- (b) **Risk Assessment Required.** A wildland fire risk and hazard severity assessment shall be performed for all structures and groups of structures adjacent to wildland fuels.
 - (c) **Maintenance of Property.** After construction, continued maintenance of the grounds and storage of combustible materials shall be performed to maintain these requirements.
 - (d) **Location of Buildings and Building Envelopes.** Buildings located closer than 30 feet to a vegetated slope shall require special mitigation measures in accordance with NFPA 1144, Standard for Protection of Life and Property from Wildfire . Building envelopes shall not include gullies, fire chimneys, saddles, or other terrain conducive to wildfire spread.
 - (e) **Roof Design and Materials.** Only roof covering assemblies rated Class A shall be used in a wildland area. The specific class shall be consistent with the wildland fire risk and hazard severity assessment.
 - (f) **Accessory Structures.** Outbuildings, patio covers, gazebos, and other accessory structures shall be separated from the main structure by a minimum of 30 feet.
 - (g) **Access to Structures.** At least one approved means of vehicular access shall be provided to each structure or other nonstructural fire hazard in accordance with the following:
 - (i) For structures or nonstructural fire hazards exceeding two stories or 30 feet in height above average adjacent ground level, or 12,000 square feet of gross floor area, no less than 2 separate approved means of access shall be provided.
 - (ii) Approved vehicular access shall be provided to within 150 ft of any point of the exterior wall of each structure.
 - (h) **Access to Structures Not Protected by Automatic Sprinklers.** An approved means of vehicular access shall be provided to within 30 feet of all points of at least 2 exterior walls for any structure not protected by automatic sprinklers that exceeds 2 stories or 30 feet in height above average adjacent ground elevation. Single and two-family dwellings are exempt from this requirement.
 - (i) **Access to Structures Protected by Automatic Sprinklers.** For any structure protected by an automatic sprinkler system, an approved means of vehicular access shall be provided to within 400 feet of any point of the exterior wall. For any structure exceeding 3 stories or 35 feet in height above average adjacent ground elevation and protected by an automatic sprinkler system, an approved means of vehicular access shall be provided to within 30 feet of all points of at least 2 exterior walls.
 - (j) **Separation Between Structures.** A structure in a planned building area shall be separated from another structure by at least 30 feet and shall be located at least 25 feet from a lot, parcel, or tract line. A structure in a planned building area that exceeds 2 stories or 30 feet in height above average adjacent ground elevation and is not protected by an automatic sprinkler system shall be separated from other structures by at least 50 feet and shall be located at least 25 feet from a lot, parcel, or tract line.
- (2) **Wildland Fire and Hazard Mitigation Plan Required.**
- (a) **General Plan Standards and Requirements.**
 When a subject lot, parcel, or tract falls within a wildland fire area, a wildland fire risk and hazard mitigation plan shall be prepared by a qualified professional and shall be tailored to the stage of development application and the stage of subdivision-related construction. A higher level of plan may be submitted at any stage of the process so long as it is implemented at the final stage of development. Plans shall utilize the

Colorado State University (CSU) Guidelines and NFPA standards, as applicable. Additional fire precaution measures may be required because of fire hazard in the following areas:

- (i) Areas depicted as forested on the Vegetation Map;
- (ii) Areas rated as fire hazards by the CSFS;
- (iii) Where slopes in or adjacent to proposed development are in excess of 20%; or
- (iv) Where the local fire protection agency identifies a specific fire danger.

(b) **Development of Plan.**

- (i) General Mitigation Plan Requirements. This plan shall include, but not be limited to, the following:

- Access, ingress, egress, and evacuation;
- Fuel modification;
- Water supply;
- Construction, location, and design of structures; and
- Ignition potential.

- (ii) Approval of Wildland Fire and Hazard Mitigation Plan. The Approval Authority shall approve the mitigating measures relative to access, defensible space, water supply, and construction based on the relative risk and hazard rating.

(3) **Wildland Fire Risk and Hazard Severity Analysis Required.**

- (a) **Risk Assessment to be Performed.** A risk and hazard rating analysis shall be performed to determine the level of the wildland fire threat to life and values at risk prior to building permit authorization in high hazard areas unless completed as part of the wildland fire and hazard mitigation plan.
- (b) **Basis for Mitigation Measures.** The risk and hazard ratings shall be the basis for the implementation of mitigation measures relative to vegetation, other combustibles, and construction criteria.
- (c) **Analysis Rating Factors.** The following shall be considered in analyzing the risk factors:

- The history of local wind, relative humidity, temperature, and fine fuel moisture content shall be considered in determining defensible space.
- All vegetative fuels and other combustible materials shall be evaluated for their potential to contribute to the intensity and spread of wildland fire.
- Slope and aspect shall be evaluated as to their potential to increase the threat of wildland fire to life or improved lot, parcel, or tract.
- The factors determining required defensible space shall include the history of wildland fire for the area.

- Fire-safe routes for emergency service apparatus and for egress shall be evaluated.
 - Other factors that can affect the risk of ignition or the spread of wildland fire on improved lot, parcel, or tract, including the risk of structure fires spreading to vegetation, shall be part of the analysis.
- (d) **Recommendation of Wildland Fire Risk and Hazard Rating.** The rating assignments developed to meet the requirements of this Code may be reviewed by the Fire Authority who may provide a recommendation regarding the rating.
- (4) **No Permit or Approval Granted without Compliance.** No permit or approval associated with development, construction or occupancy shall be approved or issued until the provisions of this standard are satisfied. Notwithstanding the foregoing, the Planning and Community Development Director shall have the authority to grant administrative variances to the design standards of this Section upon the finding of two or more of the following criteria:
- The fire authority responsible for providing fire protection services, as applicable, to the project has adopted a fire code with a more stringent design standard from that contained herein;
 - The application of a design standard will cause undue hardship or practical exceptional difficulties; or
 - An alternate design standard will satisfy the intent and meet the goals of these Fire Protection and Wildfire Mitigation Regulations.
- (5) **Defensible Space Requirements.**
- (a) **General.** The Defensible Space Requirements in Table 6.8 shall be implemented as minimum requirements in association with development in any Wildland Fire Area.

Table 6-8. Defensible Space Clearing and Structural Summary (Recommendations from NFPA by Wildland Fire Hazard Severity Analysis)

Low Hazard	High Hazard
9.14 m (30 ft) clearance. Class A roof. No portion of trees or other vegetation within 3.048 m (10 ft) of chimney outlets. Trees within defensible space shall be pruned to minimize ladder fuels.	9.14 m (30 ft) irrigated. Class A roof. 30.48 m (100 ft) fuel treatment. Noncombustible siding/decks, and boxed eaves. Selected fire-resistant trees within 9.1 m (30 ft) of structures. Selected thinning of trees and shrubs. Trees within defensible space shall be pruned to minimize ladder fuels. All trees and shrubs pruned of dead material. No portion of trees or other vegetation within 3.48

	m (10 ft) of chimney outlets.
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- (b) **Maintenance of Defensible Space and Associated Fuel Break Thinning.** Defensible space and fuel break thinning work shall be completed and maintained to the standards described in the Colorado State University's Cooperative Extension Fact Sheet 6.302. The responsibility for maintaining defensible space and associated fuel break thinning lies with the landowner. Noncompliance with defensible space maintenance standards will be enforced as a zoning violation.

(6) **Fuels Modification During Development and After Construction.**

- (a) **Identification of Modification Required.** Identification of fuel modification measures may be required in order to reduce the threat of wildfire. If fuel modification is determined to be necessary, the plan shall be prepared by a qualified professional. A fuel modification plan shall comply with NFPA requirements. Required elements shall include but are not limited to the following:

- Identification of fuel type, volume and loading, in conjunction with an assessment of slope and aspect, to determine the ability for a wildfire to spread;
- Reduction of fuel loading and modification of fuel types to reduce the risk to structures or adjacent vegetation, including the creation of fuel breaks; and
- Creation of defensible space to protect structures from approaching wildfire and reduce the potential for turning a structure fire into a wildfire.

- (b) **Fuel Modification Standards.** When the Wildland Fire Risk and Hazard Mitigation Plan requires establishment of a fuel modification area:

- The modifications shall extend at least 30 feet from structures;
- Ground fuels within the defined defensible space shall be treated or removed;
- Live vegetation within the defensible space shall have dead material removed and shall be thinned and pruned;
- Dead or downed fuels within the defensible space of buildings shall be removed or treated to maintain the fuel modification area;
- Vegetation under trees within the fuel modification area shall be maintained at a height that will preclude ground fire from spreading in the tree crown;
- The fuel modification plan shall include a maintenance element with the responsibility for maintenance defined;

- In these areas all slash (fallen trees, shrubs, pulled stumps, and other combustible materials) may be required to be disposed of from an area extending to at least 150 feet from the road centerline prior to the acceptance of any roads;
 - All slash shall also be removed from the vicinity of the home sites prior to final building inspection; and
 - Continuous proper forest management to maintain a low wildfire danger shall be guaranteed.
- (7) **Combustible Materials.** Propane tanks and other combustible liquids storage shall conform to NFPA 30, Flammable and Combustible Liquids Code, NFPA 58, Liquefied Petroleum Gas Code, and the Wildland Fire Risk and Hazard Mitigation Plan. Other combustible materials shall be removed from the defensible space or stored in conformance with the fire protection plan.

Agency Review Comments

Project

Project Name

Land Development Code Revisions to 6.3.3, Fire Protection and Wildfire Mitigation

Applicant

El Paso County

Mark Gebhart

(719) 520-6323

File Number

LDC201

Project Manager

Nina Ruiz (NinaRuiz@elpasoco.com)

(719) 520-6313

Status

Active

Created

7/21/2020 6:44:58 AM

Review Comments (47)

Agency	Comment	Date
Tri-Lakes-Monument Fire Protection District	No additional comments. JCB	11/3/2020 9:22:14 AM
Falcon Fire Protection District	no additional comments	11/2/2020 2:38:40 PM
Black Forest Land Use Committee	The Black Forest Land Use Committee has no inputs for this revision.	10/29/2020 5:44:48 AM
Pikes Peak Regional Building Department	no comment	10/27/2020 1:14:35 PM

Academy SD 20 Building Fund	Academy District 20 is in receipt of file LDC201 and has no comment. If you need additional information, please contact me. Don Smith Planning Consultant 719-234-1222	10/26/2020 7:46:48 AM
El Paso County Conservation Dist		10/21/2020 2:02:23 PM
County Attorney - Development Review	County Attorney comments are attached.	10/20/2020 2:38:06 PM
Northern EPC Coalition of Community Organizations, Inc. (NEPCO)	NEPCO reiterates the following 3 items that were not specifically dealt with during the latest re-write of this Code section. We also add one new comment below. 1. Section 6.3.3. uses the term "approval authority" 12 times in its revision, yet it does not define who the approval authority is. 2. Under the Land Development Code, Section 1.15 Definitions: Approval Authority -- The PCD Director, the BoCC, Planning Commission, Board of Adjustment, El Paso County Engineering Criteria Manual (ECM) Administrator, Building Official, or other person or agency, depending on the type of development permit or decision specified by State Statute or this Code, sanctioned to make a final decision approving, denying or conditionally approving the development permit or other requested action. 3. Therefore, what person/position is specified by State Statute or this Code and sanctioned to make a final decision approving, denying, or conditionally approving the 12 decisions in Section 6.3.3? Although the Town of Monument employees/staffers may assume that they know who the approval authority is for various actions, the members of the public for which the Code is written, certainly do not. Therefore, please address in this Code section, either generally or specifically, who the Approval Authority is under State Statute or Code, and/or how one tells who the Approval Authority is when there is no State Statute or Code that appears to delegate such authority. Thank you.	10/20/2020 12:09:27 PM

Ellicott Fire
Protection
District

I have reviewed the revised Chapter 6 of the El Paso County Land Development Code and discussed my previous comments with Nina Ruiz. At this time I do not have and objections with the revised land development code changes. I do have some comments and notes from our discussion.

10/20/2020
9:31:14
AM

Definition-

The definition of Fire Authority: The way it is revised does not change the way the code is used or interpreted. We did discuss that the Fire Authority Having Jurisdiction (AHJ) is a commonly used term and definition. It is suggested that this term and definition be considered for future revisions. However, whether or not this was use as the definition would not change the intent of the land development code.

6.3.3 Fire Protection and Wildfire Mitigation

A(3) Relationship to Other Standards.

This section seemed to put the codes at odds. However, after review this section seeks alternatives from the Fire Authority and recommendations if such alternatives meet the intent of Chapter 6 of the Land Development Code and the Fire Code. Per our conversation this section does not diminish the authority of the Fire District or Fire Chief under C.R.S. 32-1-1002.

6.3.3 Fire Protection and Wildfire Mitigation

A(4) Responsibility of Fire Authority.

"It is the responsibility of the Fire Authority to provide recommendations as to whether a new development meets the applicable fire code standards for the respective area."

I agree with this section. The next section is also correct however, it may not be how we practice the implementation of the code.

"If a new development does not meet the applicable standards, then the fire authority should provide comments regarding areas of non-compliance and recommendations for achieving compliance."

I believe that the developer should also be given the option of how to meet the intent of the code through alternative design. If unable or unwilling to do so then the Fire Authority would make recommendations on how to meet the intent of the code. There should be some agreement prior to approval by the Board of County Commissioners. This is simply a difference in how we use the code to ensure compliance. This meets the

general intent of both codes however we may look at revising this in the future.

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(1) Water Supply

(b) Automatic Fire Protection

This is the only section we discussed that requires a change. It should read:

Automatic Fire Protection shall be in compliance with the adopted PPRBD Regional Building Code and/or applicable adopted Fire Code. I believe the above section for Automatic Fire protection is the only one that needs to be change. Otherwise I support the other changed to Chapter 6 of the Land Development Code.

Thank you for letting me be a part of the review process.

Mark A Stanwood

Fire Marshal

Ellicott Fire Protection District

Stratmoor Hills Fire Protection District

Tri-County Fire Protection District

719-360-0578

Stratmoor Hills
Fire
Department

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10/20/2020
9:29:12
AM

Definition-

The definition of Fire Authority: The way it is revised does not change the way the code is used or interpreted. We did discuss that the Fire Authority Having Jurisdiction (AHJ) is a commonly used term and definition. It is suggested that this term and definition be considered for future revisions. However, whether or not this was use as the definition would not change the intent of the land development code.

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Thank you for letting me be a part of the review process.

Mark A Stanwood
Fire Marshal
Ellicott Fire Protection District
Stratmoor Hills Fire Protection District
Tri-County Fire Protection District
719-360-0578

Colorado Springs Public Works	EDRD has no comments on this item. Patrick V. Morris Civil Engineer II Public Works/Engineering Development Review City of Colorado Springs 30 S. Nevada Ave., Suite 401 Colorado Springs, CO 80903 tel: 719-385-5075 Main: 719-385-5979 patrick.morris@coloradosprings.gov	10/19/2020 2:17:39 PM
Fountain	No additional comments per the Fountain Fire Department.	10/12/2020 11:28:52 AM
USAFA Base Planner	Thank you for the opportunity to review. USAFA does not have any additional comments or concerns.	10/8/2020 11:53:42 AM

Cimarron Hills Fire	Land Development Code, Fire Protection Revision looks good and I have no further comments at this time. I would like to attend further meetings and show support for this Code Revision. JT McLeod Division Chief Fire and Life Safety, CHFD.	10/8/2020 8:28:57 AM
Schriever AFB	Schriever AFB has no issues or concerns.	10/8/2020 7:58:34 AM
Colorado Department of Transportation - Pueblo Office		10/7/2020 5:22:37 PM
Pikes Peak Regional Building Department	No comment	8/17/2020 8:06:30 AM
Tri-Lakes-Monument Fire Protection District	No additional comments to the ones previously submitted about seeking clarification as to who the actual Authority having jurisdiction will be. JCB	8/13/2020 11:28:46 AM
County Attorney - Development Review	County Attorney's Office will work with staff outside the eDARP process to review and finalize drafts.	8/13/2020 9:32:55 AM
Woodmen Hills Metro	Woodmen Hills Metropolitan District objects to (C) Design Standards (1) Water Supply (c) Areas with Central Water Systems (ii) Dead end mains shall not exceed 600 feet in length for main sizes less than 10 inches in diameter.	8/12/2020 4:41:23 PM
Falcon Fire Protection District		8/11/2020 2:31:47 PM

Colorado Springs Public Works	City SWENT has no comments. Anna Bergmark Stormwater Enterprise City of Colorado Springs 30 S. Nevada Ave., Suite 401 Colorado Springs, CO 80901 (719) 385-5613 office (719) 619-9427 Cell Anna.Bergmark@coloradosprings.gov	8/11/2020 9:10:52 AM
Colorado Springs Public Works	Engineering Development Review Division has no comments Patrick V. Morris Civil Engineer II Public Works/Engineering Development Review City of Colorado Springs 30 S. Nevada Ave., Suite 401 Colorado Springs, CO 80903 tel: 719-385-5075 Main: 719-385-5979 patrick.morris@coloradosprings.gov	8/10/2020 10:37:08 AM

Stratmoor Hills Fire Department	The Stratmoor Hills Fire Protection District Objects to the revisions to the Land Development Code Section 6.3.3 Fire Protection and Wildfire Mitigation. The Stratmoor Hills Fire Protection District firmly believes that Section 6.3.3 Fire Protection and Wildfire Mitigation does not apply to a Fire District with an adopted Fire Code approved by the El Paso County Commissioners. The Stratmoor Hills Fire District has adopted the 2009 Intentional Fire Code with local amendments, which has been approved by the El Paso County Board of County Commissioners. This adoption and approval makes the code a law equal to the Land development code. However the state statute CRS 32-1-1002 makes the authority, responsibility and enforcement of the code a state law once approved by the Board of County Commissioners. The International Fire Code is more stringent and detailed than the Section 6.3.3 Fire Protection and wildfire Mitigation. The Stratmoor Hills Fire Protection District Intends on continuing to use the International Fire Code as an enforceable law. This being said we do believe that Section 6.3.3 Fire Protection and Wildfire Mitigation is an important section for Fire Protection Districts without an adopted Fire Code. Please keep us informed of any future meetings or hearings related to this matter. See attached. Mark Stanwood Fire Marshal Stratmoor hills Fire Protection District 719-360-0578 markstanwood32@gmail.com	8/8/2020 9:43:54 AM
Stratmoor Hills Fire Department		8/8/2020 9:18:04 AM
Stratmoor Hills Fire Department		8/8/2020 9:17:37 AM

Ellicott Fire Protection District	The Ellicott Fire Protection District objects to the purposed changes to the Land development Code Section 6.3.3, Fire Protection and Wildfire Mitigation as submitted. The basis of the changes were to remove the term Fire Marshal and replace with Fire Authority. However, the changes went far beyond simply changing the titles. First of all we believe the section Fire Protection does not apply to a Fire Protection District with an adopted Fire Code approved by the El Paso County Board of County Commissioners. However, this code is extremely important to Fire Districts without an adopted Fire Code. Per State law Fire Districts can enforce local laws pertaining to Fire Protection. The Ellicott Fire Protection District currently does not have an adopted fire code. Even with this code in-place here have been developments approved that did not conform to this code. Example a large commercial dog rescue and kennel complex without fire protection water supply. A urban/suburban development change to a PUC with residential (6,000 SQ FT) lots with 3.5 FT side set backs. This is in an area surrounded by large lots with the smallest nearby being 5 acres. The purposed hundreds of lots are in a rural volunteer fire district locate 15 miles outside of Colorado Springs. This development extremely exceeds the capabilities of the Fire Department and should never have been approved. However, we are working with the developer to make it work. Another Residential development we required a single 30,000 gallon Cistern. we have heard the developer is proceeding with the project without a Cistern and no fire protection water supply. These are just examples of how this code has not worked very well for us so far. So we have decided to adopt the 2015 International Fire code and are currently going through the approval process. I have attached a red-line version of our purposed changes to the Land Development Code Section 6.3.3 and a second document with comments. Please see attachments. We believe there needs to be more discussion on this topic. However, we request to be informed of any public hearings related to these changes. Thank you. Mark Stanwood Fire Marshal Division Chief of Fire Ellicott Fire Department markstanwood32@gmail.com 719-360-0578	8/6/2020 8:59:35 PM
Ellicott Fire Protection District		8/6/2020 8:24:10 PM

Ellicott Fire Protection District		8/6/2020 8:23:43 PM
Academy SD 20 Building Fund	Academy District 20 is in receipt of file number LDC201. The District has no comment regarding the proposed changes. Don Smith Planning Consultant	8/5/2020 7:45:06 AM
Woodmoor Water and Sanitation District	6.3.3.C.c: Item (ii) seems to conflict with item (v). For clarification on dead-end mains, is it that a 6" dead-end pipe cannot exceed 300 ft, an 8" dead-end pipe cannot exceed 600 ft, and no pipe less than 10" in diameter can exceed 600 ft on a dead-end main? For reference: ii. Dead-End Mains. Dead-end mains shall not exceed 600 feet in length for main sizes less than 10 inches in diameter. v. Fire Hydrant Supply Lines. Fire hydrants shall be supplied by not less than a 6 inch diameter main installed on a looped system, or by not less than an 8 inch diameter main if the system is not looped or the fire hydrant is installed on a dead-end main exceeding 300 feet in length.	8/3/2020 5:37:04 PM
Northern EPC Coalition of Community Organizations, Inc. (NEPCO)	Section 6.3.3. uses the term "approval authority" 12 times in its revision, yet it does not define who the approval authority is. Under the Land Development Code, Section 1.15 Definitions: Approval Authority -- The PCD Director, the BoCC, Planning Commission, Board of Adjustment, El Paso County Engineering Criteria Manual (ECM) Administrator, Building Official, or other person or agency, depending on the type of development permit or decision specified by State Statute or this Code, sanctioned to make a final decision approving, denying or conditionally approving the development permit or other requested action. Therefore, what person/position is specified by State Statute or this Code and sanctioned to make a final decision approving, denying or conditionally approving the 12 decisions in Section 6.3.3.? Thank you.	8/3/2020 11:51:44 AM
Black Forest Land Use Committee	I believe this is a duplicate in EDARP. The Black Forest Land Use Committee has no comments.	7/30/2020 6:38:00 AM

Black Forest Land Use Committee	The Black Forest Land Use Committee has no comments or recommended changes.	7/30/2020 6:36:48 AM
Schriever AFB	Schriever AFB has no issues or comments.	7/28/2020 1:45:46 PM
Fountain	No comments. The Fountain Fire Inspector had previously reviewed the documents and those comments have been incorporated into this document.	7/28/2020 1:27:33 PM
Fountain	No comments. The Fountain Fire Inspector had previously reviewed the documents and those comments have been incorporated into this document.	7/28/2020 1:25:29 PM
The Glen Metro Districts (1 - 3)	No comment	7/27/2020 2:58:47 PM
Colorado Springs Public Works	Traffic Engineering has no comments on this item. Zaker Alazzezh, P.E. Traffic Engineering Manager City of Colorado Springs (719) 385-5468 Zaker.Alazzezh@coloradosprings.gov	7/27/2020 1:36:25 PM
El Paso County Conservation Dist	The El Paso County Conservation District board of supervisors have no comments at this time. Thank you, Ken Barker Board President	7/27/2020 11:06:33 AM
El Paso County Conservation Dist	The El Paso County Conservation District board of supervisors have no comment at this time. Thank you, Ken Barker Board President	7/27/2020 10:53:26 AM
Colorado Springs Fire Department	See attached document for comments.	7/23/2020 1:08:18 PM

Colorado Springs Fire Department	See attached document for comments.	7/23/2020 1:05:54 PM
Cimarron Hills Fire	Document and changes look good. I would maybe consider using "Authority Having Jurisdiction" rather than Fire Authority. "Fire Authority" could be considered a different version of a "Fire District." Otherwise everything looks good and we are already following this as a Fire Protection District. J.T. McLeod Division Chief of Fire Prevention, CHFD Fire Inspector III-Plan Examiner	7/22/2020 1:08:20 PM
Academy SD 20 Building Fund	Academy School district is in receipt of file number LDC201. The district has no comment regarding the proposed revisions. Don Smith Planning Consultant	7/22/2020 7:27:44 AM
Colorado Springs Utilities, Dev, Svc.(includes water resources)	Colorado Springs Utilities has no comment on the attached documents. Review request should be sent to Colorado Springs Fire Department for any objections or comments. -Kyle Schelhaas, 719-668-8126, kschelhaas@csu.org	7/21/2020 1:39:57 PM
Colorado Springs Utilities, Dev, Svc.(includes water resources)	Colorado Springs Utilities has no comment on the attached documents. Review request should be sent to Colorado Springs Fire Department for any objections or comments. -Kyle Schelhaas, 719-668-8126, kschelhaas@csu.org	7/21/2020 1:39:37 PM



El Paso County Conservation District

5610 Industrial Place, Ste 100, Colorado Springs, CO 80916, Phone (719)600-4706

EPCDistrict@yahoo.com

<http://www.EPCCD.org>

Board of Supervisors

Kenneth Barker, President

John Eastlake, Vice President
Katie Miller, Secretary/Treasurer

Roger Rasner, Supervisor
Pamela Davison, District Manager

To Whom it May Concern:

The El Paso County Conservation District Board of Supervisors have no comments on this review at this time.

Kenneth Barker

EPCCD Board President
Kenneth Barker

County Attorney Comments

Replace "Fire Marshal" with "Fire Authority" throughout.

~~Fire Marshal Authority~~ — For purposes of this Code, El Paso County Fire Marshal, a the person designated by the Fire District or, Fire Department within whose their boundaries the property lies. For purposes of conducting reviews and making recommendations pursuant to Section 6.6.3, this term shall also include a Third-Party Fire Reviewer for properties not located within the boundaries of a Fire District or Fire Department, "Fire Authority" may include the Sheriff's Office for certain fire events.

Commented [LS1]: Including this "part-time" definition creates confusion, as it is not always clear in the text of the regulations when the Sheriff's Office may be included. I recommend you delete this from the definition of Fire Authority, and specifically add the Sheriff's Office to those substantive provisions where it is needed.

Third Party Fire Reviewer- a person with a minimum of an State of Colorado Inspector II, ICC or NFPA Certification who has provided El Paso County with a copy of such certification and who has self-certified that they are qualified to provide comment and recommendations.

Fireworks Sales

(A)

Sales Period Limited. Fireworks sales are limited to the period from May 31 to July 6th each year.

(B)

Fire Department Authority Approval Required. ~~The fireworks sales area shall be located within an area provided with fire protection by a fire department. Fire department~~ Fire Authority approval is required prior to the approval of a temporary use permit.

(C)

Driveway Permit Required. A driveway permit shall be issued to allow access to the fireworks sales area prior to the approval of a temporary use permit.

(D)

Required Signage. A fireworks sales area shall post signage noting it is illegal to shoot fireworks within all towns and cities in El Paso County and violators will be prosecuted. Each fireworks sales area shall provide either one sign, with minimum 3-inch letter size, or 4 signs of 8½ by 11 inches, placed in a conspicuous location easily readable by the public, noting the language as stated or similar language approved by the PCD Director.

6.3.3. Fire Protection and Wildfire Mitigation

(A) General.

- (1) **Purpose and Intent.** ~~The purpose of this section is to~~ To ensure that proposed development is reviewed in consideration of the wildfire risks and need to provide adequate fire protection ~~by in order to:~~

- ~~Regulating~~ development, buildings, and structures so as to minimize the hazard to public health, safety, and welfare;

- Ensuring that adequate fire protection is available for new development;
- Implementing wildfire hazard reduction in new development;
- Encouraging voluntary efforts to reduce wildfire hazards; and
- Reducing the demands from the public for relief and protection of structures and facilities.

(2) **Applicability.** This Section shall apply to all development applications and permits within the unincorporated areas of El Paso County. The standards and requirements related to construction in wildland areas are applicable on land that is shown as forested on the Vegetation Map or to areas identified in the a wildland fire risk and hazard mitigation plan, if required by the approval of that plan.

(3) **Relationship to Other Standards.** ~~Where a conflict exists between adopted fire district or fire department standards and this Code, the Board of County Commissioners may choose to approve an alternative design which accomplishes the purpose of this section and provides an equivalent benefit to the development. Where a fire department has adopted standards, the more restrictive shall apply. In the case of a conflict between adopted fire district standards and this code, the Fire Marshal~~ Fire Authority should approve provide a recommendation regarding whether the an alternative design which accomplishes the intent of this section and whether it provides an equivalent or similar benefit to the the development property or the community.

(4) **Responsibility of Fire Authority.** ~~The Fire Marshal shall have authority to enforce the provisions of this Section. The Fire Marshal shall be authorized to develop and utilize forms and checklists to implement the requirements of this Section. It is the responsibility of the Fire Authority to provide recommendations as to whether a new development meets the applicable fire code standards for the respective area. If a new development does not meet the applicable standards, then the Fire Authority should provide comments regarding areas of non-compliance and recommendations for achieving compliance.~~

(5) **Basis of Standards.** The basis of the standards in this Section is the most current standards adopted by the National Fire Protection Agency (NFPA) and the Colorado State Forest Service (CSFS).

(6) **Wildfire Hazard Maps/Vegetation Map.** El Paso County shall maintain a Vegetation Map depicting wildfire hazard areas of the County either based on vegetation type or wildfire hazard analysis, which shall be the official map for the purposes of applying this Section.

(B) **Reports and Commitments Required for Subdivisions.**

(1) **Fire Protection Report.** A Fire Protection Report is required for any subdivision application and shall include the ~~fire district's or fire department's~~ Fire Authority's capabilities, including existing and proposed equipment, facilities, services, and response time to provide fire protection for the proposed subdivision, an analysis of compliance with the Fire Protection and Wildfire Mitigation Section of this Code, and an analysis of compliance with the applicable fire code.

(2) **Fire Protection Commitment Required.** A written commitment to provide structural fire protection may be required for any proposed subdivision, and the PCD Director may be requested a written commitment by the Fire Marshal for other development applications.

(3) **Mitigation Costs Included in Construction Financial Assurance.** ~~— If the Board of County Commissioners determines that~~ wildfire mitigation issues are significant enough in the determination of the Fire Marshal to require mitigation associated with development

construction activities, the cost of the mitigation shall be included in the construction financial assurance. ~~The Fire Authority may, at its discretion, choose to provide a recommendation to the Board of County Commissioners regarding whether the cost associated with performing wildfire mitigation is appropriate and should be secured and accounted for within the financial assurance estimate and associated collateral for the overall development.~~

~~(4) Development Outside Fire District or Fire Department Boundaries. Proposed subdivisions outside the boundaries of a fire district or fire department shall annex into or shall provide evidence of a contract for service from a department or provide evidence of a contract for service from a Fire District or Fire Department. Waivers of this requirement may only be approved by the Board of County Commissioners. An applicant's waiver request shall, at a minimum, include the following:~~

- ~~• A letter from the nearest fire district or fire department demonstrating that annexation is not economically feasible.~~
- ~~• A letter or report from a Third-Party Fire Reviewer providing a recommendation to the Board of County Commissioners that the proposed development complies with the Fire Protection and Wildfire Mitigation Section of this Code. In the case of a conflict between adopted standards and this Code, the Third-Party Fire Reviewer may recommend an alternative design which accomplishes the purposes of this section and provides an equivalent benefit to the development.~~

(4) **Plat Notes Required.** Notice of any wildfire mitigation issues or obligations may be required by the County through conditions of approval or notes placed on the face of the plat.

(C) **Design Standards.**

(1) **Water Supply.**

- (a) **General.** Water supply systems used for fire protection purposes shall be installed and maintained in accordance with NFPA standards. The required fire flow for one or more buildings of a planned building area (also referred to as the planned building group by the NFPA) shall be determined by the ~~Fire Marshal~~**Fire Authority** using locally adopted codes, or as specified per the following conditions:

Commented [LS2]: This phrase is used several times in this section. Is it defined anywhere?

- For areas without municipal-type water systems, NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting, shall be applied.

- For those areas with municipal-type water systems, nationally recognized criteria shall be applied.

(b) **Automatic Fire Protection.**

- (i) ~~Commercial and Industrial Structures. All commercial or industrial structures of more than 3 stories or over 40 feet in height above adjacent ground elevation shall be fully protected with an automatic sprinkler system.~~
- (ii) ~~Multifamily Residential Structures. Any multifamily residential building containing more than 2 dwelling units shall have an automatic sprinkler system installed. Automatic fire protection shall be in compliance with the applicable adopted fire code.~~

(c) **Areas with Central Water Systems.**

- (i) **Water Distribution System Pressure.** The water distribution system shall be capable of delivering fire flow at a minimum rating of 20 pounds per square inch

for each hydrant connected to the distribution system within the proposed subdivision.

- (ii) Dead-End Mains. Dead-end mains shall not exceed 600 feet in length for main sizes less than 10 inches in diameter.
 - (iii) Fire Hydrant Spacing. Fire hydrants shall be located so that all residential structures are within 500 feet and all nonresidential structures are within 150 feet of a hydrant. Fire hydrants shall be installed adjacent to a road or emergency vehicle lane at a spacing not to exceed 660 feet of vehicle travel distance. Where the proposed buildings warrant, the ~~Fire Marshal~~Fire Authority may ~~require recommend additional hydrants and closer spacing a greater spacing distance or require additional hydrants and closer spacing based upon the applicable Fire Code or NFPA standards.~~
 - (iv) Fire Hydrant Accessibility. Fire hydrants shall be accessible to fire district or fire department apparatus from a road (i.e., maintained public roads, privately-maintained roads, or emergency vehicle access roads) or unobstructed emergency vehicle lanes (i.e., driveway, parking drive aisle, or emergency vehicle lane).
 - (v) Fire Hydrant Supply Lines. Fire hydrants shall be supplied by not less than a 6-inch diameter main installed on a looped system, or by not less than an 8-inch diameter main if the system is not looped or the fire hydrant is installed on a dead-end main exceeding 300 feet in length.
 - (vi) Fire Hydrants in Parking Areas. Fire hydrants located in parking areas shall be protected by barriers that will prevent physical damage from vehicles without obstructing hydrant operation.
 - (vii) Fire Hydrant Relationship to Roads. Fire hydrants shall be located within 6 feet of the edge of the pavement unless there is a conflict with the ECM or the ~~Fire Marshal~~Fire Authority determines—recommends another location is more acceptable for fire district or fire department use. All roads and emergency vehicle lanes shall be designed to maintain a minimum unobstructed clearance of 3 feet around fire hydrants.
 - (viii) Fire Hydrant Easements. Easements for fire hydrants shall be provided and dedicated to the appropriate fire or water authority when the hydrants are not within a public road right-of-way. The easement shall afford accessibility to the hydrant from the right-of-way.
 - (ix) Release of Financial Assurance for Water Supply Systems. The contractor, installer, or owner of water supply systems shall demonstrate by testing that the capacity of the water supply system will meet fire protection design requirements prior to release of construction financial assurance for the system. The testing shall be certified by a qualified professional. The tests ~~shall~~may be provided to the ~~Fire Marshal~~Fire Authority if requested.
- (d) **Areas without Central Water Systems.**
- (i) Fire Cisterns.

• **Fire Cisterns Required:** Fire cisterns shall be provided in planned building areas which are not served by hydrants, unless the ~~Fire Marshal~~Fire Authority has recommended and the approval authority has approved an alternative fire protection water supply system.

Commented [LS3]: This phrase is used throughout this section. Who is the approval authority? If it's the BoCC, please just change all instances of use to BoCC.

- **Construction Standards:** Construction of fire cisterns shall be in accordance with the approved plans and conform to the requirements of the NFPA standard on water supplies for suburban and rural fire fighting.
- **Design Standards for Subdivisions with More than One Cistern:** For subdivisions where more than one fire cistern is required, fire cisterns shall meet the requirements of the NFPA standards for water supplies for suburban and rural fire fighting. For this type of subdivision, fire cisterns shall be designed for the largest building allowed by zoning in the ~~worst-case~~worst-case hazard and construction class.
- **Design Standards for Subdivisions with One Cistern:** For subdivisions where only one fire cistern is required, the minimum capacity of the fire cistern shall meet the requirements of the NFPA standards on water supplies for suburban and rural fire fighting, or shall have a total capacity equal to 300 gallons for each acre within the subdivision plus 3,000 gallons per dwelling unit, whichever is greater.
- **Cistern Turnaround:** A dedicated turnaround shall be placed no more than 50 feet from a fire cistern, and the standpipe shall be within 8 feet of the nearest usable portion of the dedicated right-of-way or approved easement, unless otherwise ~~recommended~~approved by the applicable ~~Fire Marshal~~Fire Authority and approved by the approval authority.
- **Easements Required:** Fire cistern easements shall be provided and dedicated to the appropriate fire department or fire district to afford accessibility of the cistern from a public road. Easements shall be of sufficient size to facilitate maintenance.

(ii) Dry Hydrants.

- **Use of Dry Hydrants:** Dry hydrants may be provided in combination with fire cisterns or other approved fire protection water supply systems. Plans for dry hydrants shall be submitted to ~~and approved by the Fire Marshal~~the Fire Authority for recommendation and approved by the approval authority.
- **Construction Standards:** Construction and installation of dry hydrants shall be in accordance with the approved plans and conform to the requirements of the NFPA standards on water supplies for suburban and rural fire fighting.
- **Accessible:** Dry hydrants shall be located to be accessible under all weather conditions.
- **Clearance:** Dry hydrants shall have a minimum clearance of 20 feet on each side and be located a minimum of 100 feet from any structure. Highway or road traffic shall not be impaired during the use of the dry hydrant.
- **Protected:** Dry hydrants shall be protected from damage by vehicular and other perils, including freezing and damage from ice and other objects.

- **Visible:** Dry hydrant locations shall be made visible from the main roadway during emergencies by reflective marking and signage ~~approved by the Fire Marshal and shall be in conformance with the NFPA requirements.~~ All identification signs shall be approved by the ~~entity having jurisdiction over the roadway highway authority~~ prior to installation if they are to be located on the right-of-way or are subject to State laws.

- **Access to Hydrant:** Vehicle access shall be designed and constructed to support the heaviest vehicle.

- **Maintenance of Dry Hydrant:** Dry hydrants shall be checked and maintained at least quarterly. Thorough surveys shall be conducted, to reveal any deterioration in the water supply situation in ponds, streams, or cisterns. Grass, brush, and other vegetation shall be kept trimmed and neat. Vegetation shall be cleared for a minimum 3-~~f~~-foot radius from around hydrants. The hydrant shall be painted as needed, with reflective material to maintain visibility during emergencies. The ~~Fire Authority may make a recommendation regarding the~~ ownership and maintenance responsibilities for the facilities ~~per the NFPA 1142 Standards. The approval authority will approve the ownership and maintenance responsibilities for the facilities shall be approved by the Fire Marshal.~~

Commented [LS4]: Is the County going to enforce this? If not, is there another way to address?

- **Maps and Location/Detail Drawings:** The ~~fire department (Fire Marshal~~ **Fire Authority and El Paso County Sheriff's Office** ~~where there is no fire department)~~ shall maintain in a safe location, the maps and records of dry hydrant system locations, installation, tests, inspections, maintenance and repairs. ~~When the property is not within a Fire Protection District it is the responsibility of the property owner and El Paso County Sheriff's Office to maintain in a safe location, the maps and records of dry hydrant system locations, installation, tests, inspections, maintenance and repairs.~~

Commented [LS5]: The County does not have the authority to require the Fire Authority and the SO to do this. Is there another way to address?

- **Easements Required:** Dry hydrant easements shall be provided and dedicated to the appropriate fire department (or County where there is no fire department) to afford accessibility of the dry hydrant from a public road. Easements shall be of sufficient size to facilitate maintenance.

(iii) **Water Supply Requirements.** The owner of the cistern or dry hydrant is responsible for planning, developing, permitting, and continual provision of a sufficient water supply necessary to maintain the fire protection requirements of a cistern system, to the satisfaction of the ~~Fire approval authority~~ **Marshal with recommendation by the Fire Authority.**

(2) **Roads.** This Section shall apply to all roads providing access to a planned building area whether or not they are dedicated as public roads.

(a) **Roads Constructed to County Standards.** All roads, including private roads and emergency vehicle access roads, shall be designed and constructed according to this Code and the ECM. Emergency vehicle access roads shall, at a minimum, be constructed to the County's gravel road standard if open to the public. Emergency vehicle access roads which are not open to public travel shall meet the non-road access standards

(b) **Roads within 150 Feet of Development.** Roads or emergency vehicle lanes shall be provided within 150 feet of all development except single-family residential development.

- (c) **Two Access Routes Required.** Access to a planned building area shall be provided by a minimum of 2 separate routes in accordance with the requirements of this Code and the ECM if the cul-de-sac exceeds the length allowed by the ECM.
 - (d) **Turnaround Required on Dead-End Roads.** Every dead-end road more than 300 feet in length shall be provided with a roadway termination meeting ECM standards.
 - (e) **Road Grades in Wildland Fire Areas.** Within wildland fire areas, road grades steeper than 10 percent may be permitted where the Fire Authority and ECM Administrator recommend that the mitigation measures can be agreed on by the Fire Marshal and the ECM Administrator.
- (3) **Non-Road Access.** The following minimum standards shall apply to emergency vehicle lanes, driveways, and parking lot drive lanes serving as emergency vehicle lanes.
- (a) **Emergency Access Provided.** Access for emergency responders, ingress, egress, and evacuation shall be provided for all buildings.
 - (b) **Driveways Required.** Where any point of a building is greater than 150 feet from a road, a driveway meeting these standards shall be provided to within 150 feet of the furthest point on the building.
 - (c) **Emergency Vehicle Lanes Required.** The Fire Authority may recommend emergency vehicle lanes be provided. Emergency vehicle lanes shall be provided as required by the Fire approval authority ~~Fire Marshal.~~
 - (d) **Emergency Access Lane Design.** An emergency vehicle lane shall be designed and constructed to enable fire-fighting apparatus to maneuver broadside or directly forward within a minimum of 5 feet and a maximum of 25 feet of structures.
 - (e) **Width of Driveway and Emergency Vehicle Lanes.** Where the driveway is greater than 150 feet in length, it shall be not less than 10 feet in unobstructed width. Emergency vehicle lanes providing one-way travel shall be a minimum of 16 feet in width, and fire lanes with two-way travel shall be a minimum of 24 feet in width.
 - (f) **Vertical Clearance.** At least 13 feet 6 inches of vertical clearance shall be provided and maintained over the full width of an emergency vehicle lane or driveway.
 - (g) **Turns.** Required driveways shall be designed, constructed, and maintained to accommodate the turning radius of the largest apparatus typically used to respond to that location. Any turn in an emergency vehicle lane shall be constructed with a minimum radius of 25 feet at the inside curb line and a minimum radius of 50 feet at the outside curb line.
 - (h) **Grades.** Road grades steeper than 10 percent may be permitted where the Fire Authority and ECM Administrator recommend that the mitigation measures are adequate and the approval authority approves the mitigation measurements.
Emergency vehicle lanes and required driveways shall not exceed 10 percent in grade unless steeper grades are allowed where mitigation measures can be agreed on by the Fire Marshal and the property owner.
 - (i) **Emergency Vehicle Lanes Connecting to Roads.** Emergency vehicle lanes connecting to roads shall be provided with curb cuts extending at least 2 feet beyond each edge of the fire lane.
 - (j) **Turnouts and Turnarounds Required.**
 - (i) **Driveways.** Where the required driveway is greater than 300 feet long, it shall be provided with turnouts or turnarounds at locations approved by the Fire Marshal ~~approval authority with recommendation from the Fire Authority.~~

- (ii) **Turnarounds Required.** ~~The Fire Authority may provide a recommendation regarding turnarounds.~~ Dead-end emergency vehicle lanes in excess of 300 feet in length shall be provided with turnouts and turnarounds as approved by the ~~Fire Marshal approval authority.~~ The turnaround at the terminus shall have a minimum radius of 50 feet. The ~~Fire Marshal approval authority~~ shall be authorized to approve, as an alternative, a "hammerhead" turnaround to provide emergency vehicles with a three-point turnaround.
 - (k) **Load Design.** Emergency vehicle lanes and required driveways shall be designed, constructed, and maintained to accommodate the load of the largest apparatus typically used to respond to that location.
 - (l) **Bridges or Drainage Crossings.** A bridge or drainage crossing on an emergency vehicle lane or required driveway shall be designed to accommodate the load of the largest apparatus typically used to respond to that location. The load limit shall be clearly posted at the approaches to the bridge.
 - (m) **Landscaping Maintained.** Landscaping or other obstructions shall be maintained in a manner that provides unobstructed access for fire department operations.
 - (4) **Gates.**
 - (a) **Gate Location and Dimensions.** Gates shall be located a minimum of 30 feet from the public right-of-way and shall not open outward. The opening provided through a gate shall be 2 feet wider than the traveled way.
 - (b) **Locks.** Fire department personnel shall have ready access to locking mechanisms on a gate restricting access to a fire line. Proposed changes to access shall be approved by the ~~Fire Marshal~~ **Fire Authority**.
- (D) **Construction in Wildland Fire Areas.**
- (1) **General.**
 - (a) **Applicability.** All structures potentially threatened by wildland fire shall be designed, located, and constructed to comply with this ~~Section~~.
 - (b) **Risk Assessment Required.** A wildland fire ~~risk~~ hazard severity assessment shall be performed for all structures and groups of structures adjacent to wildland fuels.
 - (c) **Maintenance of Property.** After construction, continued maintenance of the grounds and storage of combustible materials shall be performed to maintain these requirements, ~~as acceptable to the Fire Marshal.~~
 - (d) **Location of Buildings and Building Envelopes.** Buildings located closer than 30 feet to a vegetated slope shall require special mitigation measures in accordance with NFPA 1144, Standard for Protection of Life and Property from Wildfire ~~as determined by the Fire Marshal.~~ Building envelopes shall not include gullies, fire chimneys, saddles, or other terrain conducive to wildfire spread.
 - (e) **Roof Design and Materials.** Only roof covering assemblies rated Class A shall be used in a wildland area. The specific class shall be consistent with the wildland fire risk and hazard severity assessment ~~as determined by the Fire Marshal.~~
 - (f) **Accessory Structures.** Outbuildings, patio covers, gazebos, and other accessory structures shall be separated from the main structure by a minimum of 30 feet.
 - (g) **Access to Structures.** At least one approved means of vehicular access shall be provided to each structure or other nonstructural fire hazard in accordance with the following:
 - (i) For structures or nonstructural fire hazards exceeding two stories or 30 feet in height above average adjacent ground level, or 12,000 square feet of gross floor area, no less than 2 separate approved means of access shall be provided.

Commented [LS6]: Seems like a lot of duplicative, unnecessary words. Can it just be "risk" or "hazard"?

Commented [LS7]: Is County code enforcement going to enforce this? If not, is there another way to address?

- (ii) Approved vehicular access shall be provided to within 150 feet of any point of the exterior wall of each structure.
 - (h) **Access to Structures Not Protected by Automatic Sprinklers.** An approved means of vehicular access shall be provided to within 30 feet of all points of at least 2 exterior walls for any structure not protected by automatic sprinklers that exceeds 2 stories or 30 feet in height above average adjacent ground elevation. Single and two-family dwellings are exempt from this requirement.
 - (i) **Access to Structures Protected by Automatic Sprinklers.** For any structure protected by an automatic sprinkler system, an approved means of vehicular access shall be provided to within 400 feet of any point of the exterior wall. For any structure exceeding 3 stories or 35 feet in height above average adjacent ground elevation and protected by an automatic sprinkler system, an approved means of vehicular access shall be provided to within 30 feet of all points of at least 2 exterior walls.
 - (j) **Separation Between Structures.** A structure in a planned building area shall be separated from another structure by at least 30 feet and shall be located at least 25 feet from a lot, parcel, or tract line. A structure in a planned building area that exceeds 2 stories or 30 feet in height above average adjacent ground elevation and is not protected by an automatic sprinkler system shall be separated from other structures by at least 50 feet and shall be located at least 25 feet from a lot, parcel, or tract line.
- (2) **Wildland Fire and Hazard Mitigation Plan Required.**
- (a) **General Plan Standards and Requirements.**

When a subject lot, parcel, or tract falls within a wildland fire area, a wildland fire risk and hazard mitigation plan shall be prepared by a qualified professional and shall be tailored to the stage of development application and the stage of subdivision-related construction. A higher level of plan may be submitted at any stage of the process so long as it is implemented at the final stage of development. Plans shall utilize the Colorado State University (CSU) Guidelines and NFPA standards, as applicable. Additional fire precaution measures may be required because of fire hazard in the following areas:

 - (i) Areas depicted as forested on the Vegetation Map;
 - (ii) Areas rated as fire hazards by the CSFS;
 - (iii) Where slopes in or adjacent to proposed development are in excess of 20%; or
 - (iv) Where the ~~Fire Authority local fire protection agency~~ identifies a specific fire danger.
 - (b) **Development of Plan.**
 - (i) **General Mitigation Plan Requirements.** This plan shall ~~address~~include, but not be limited to, the following ~~issues~~:
 - Access, ingress, egress, and evacuation;
 - Fuel modification;
 - Water supply;
 - Construction, location, and design of structures; and

- Ignition potential.

- (ii) Approval of ~~Fire Marshal~~Wildland Fire and Hazard Mitigation Plan. The ~~Fire Marshal~~Approval Authority shall approve the mitigating measures relative to access, defensible space, water supply, and construction based on the relative risk and hazard rating.

(3) **Wildland Fire Risk and Hazard Severity Analysis Required.**

- (a) **Risk Assessment to be Performed.** A risk and hazard rating analysis shall be performed to determine the level of the wildland fire threat to life and values at risk prior to building permit authorization in high hazard areas unless completed as part of the wildland fire and hazard mitigation plan.
- (b) **Basis for Mitigation Measures.** The risk and hazard ratings shall be the basis for the implementation of mitigation measures relative to vegetation, other combustibles, and construction criteria.
- (c) **Analysis Rating Factors.** The following shall be considered in analyzing the risk factors:
 - The history of local wind, relative humidity, temperature, and fine fuel moisture content shall be considered in determining defensible space.
 - All vegetative fuels and other combustible materials shall be evaluated for their potential to contribute to the intensity and spread of wildland fire.
 - Slope and aspect shall be evaluated as to their potential to increase the threat of wildland fire to life or improved lot, parcel, or tract.
 - The factors determining required defensible space shall include the history of wildland fire for the area.
 - Fire-safe routes for emergency service apparatus and for egress shall be evaluated.
 - Other factors that can affect the risk of ignition or the spread of wildland fire on improved lot, parcel, or tract, including the risk of structure fires spreading to vegetation, shall be part of the analysis.

- (d) ~~Recommendation~~**view of Wildland Fire Risk and Hazard Rating.** The rating assignments developed to meet the requirements of this Code ~~shall~~ may be reviewed by the ~~Fire Marshal~~Fire Authority who may provide a recommendation regarding the rating.

- (4) **No Permit or Approval Granted without Compliance.** No permit or approval associated with development, construction or occupancy shall be approved or issued until the provisions of this standard are satisfied. Notwithstanding the foregoing, the ~~Fire Marshal~~Planning and Community Development Director shall have the authority to grant administrative variances to the design standards of this Section upon the finding of two or more of the following criteria:

- The ~~fire district or fire protection district~~ Authority responsible for providing fire protection services, ~~as applicable,~~ to the project has adopted a fire code with a more stringent design standard from that contained herein;
- The application of a design standard will cause undue hardship or practical exceptional difficulties; or
- An alternate design standard will satisfy the intent and meet the goals of these Fire Protection and Wildfire Mitigation Regulations.

(5) **Defensible Space Requirements.**

- (a) **General.** The Defensible Space Requirements in Table 6.8 shall be implemented as minimum requirements in association with development in any Wildland Fire Area.

Table 6-8. Defensible Space Clearing and Structural Summary (Recommendations from NFPA by Wildland Fire Hazard Severity Analysis)

Low Hazard	High Hazard
9.14 m (30 ft) clearance. Class A roof. No portion of trees or other vegetation within 3.048 m (10 ft) of chimney outlets. Trees within defensible space shall be pruned to minimize ladder fuels.	9.14 m (30 ft) irrigated. Class A roof. 30.48 m (100 ft) fuel treatment. Noncombustible siding/decks, and boxed eaves. Selected fire-resistant trees within 9.1 m (30 ft) of structures. Selected thinning of trees and shrubs. Trees within defensible space shall be pruned to minimize ladder fuels. All trees and shrubs pruned of dead material. No portion of trees or other vegetation within 3.48 m (10 ft) of chimney outlets.

- (b) **Maintenance of Defensible Space and Associated Fuel Break Thinning.** Defensible space and fuel break thinning work shall be completed and maintained to the standards described in the Colorado State University's Cooperative Extension Fact Sheet 6.302. The responsibility for maintaining defensible space and associated fuel break thinning lies with the landowner. Noncompliance with defensible space maintenance standards will be enforced as a zoning violation.
- (6) **Fuels Modification During Development and After Construction.**
- (a) **Identification of Modification Required.** Identification of fuel modification measures may be required in order to reduce the threat of wildfire. If fuel modification is determined to be necessary, the plan shall be prepared by a qualified professional. A

fuel modification plan shall comply with NFPA requirements. Required elements shall include but are not limited to the following:

- Identification of fuel type, volume and loading, in conjunction with an assessment of slope and aspect, to determine the ability for a wildfire to spread;
- Reduction of fuel loading and modification of fuel types to reduce the risk to structures or adjacent vegetation, including the creation of fuel breaks; and
- Creation of defensible space to protect structures from approaching wildfire and reduce the potential for turning a structure fire into a wildfire.

(b) **Fuel Modification Standards.** When the Wildland Fire Risk and Hazard Mitigation Plan requires establishment of a fuel modification area:

- The modifications shall extend at least 30 feet from structures;
- Ground fuels within the defined defensible space shall be treated or removed;
- Live vegetation within the defensible space shall have dead material removed and shall be thinned and pruned;
- Dead or downed fuels within the defensible space of buildings shall be removed or treated to maintain the fuel modification area;
- Vegetation under trees within the fuel modification area shall be maintained at a height that will preclude ground fire from spreading in the tree crown;
- The fuel modification plan shall include a maintenance element with the responsibility for maintenance defined;
- In these areas all slash (fallen trees, shrubs, pulled stumps, and other combustible materials) may be required to be disposed of from an area extending to at least 150 feet from the road centerline prior to the acceptance of any roads;
- All slash shall also be removed from the vicinity of the home sites prior to final building inspection; and
- Continuous proper forest management to maintain a low wildfire danger shall be guaranteed.

(7) **Combustible Materials.** Propane tanks and other combustible liquids storage shall conform to NFPA 30, Flammable and Combustible Liquids Code, NFPA 58, Liquefied Petroleum Gas Code, and the Wildland Fire Risk and Hazard Mitigation Plan. Other combustible materials shall be removed from the defensible space or stored in conformance with the fire protection plan as approved by the Fire Marshal.



COLORADO
Department of Transportation
Region 2 Permits
5615 Wills Blvd.
Pueblo, CO 81008-2349

September 23, 2020

Nina Ruiz, Project Manager
El Paso Planning & Community
Development
2880 International Circle
Colorado Springs, CO 80910

RE: Fire Protection & Wildfire Mitigation | Revisions to remove Fire Marshal
LDC201 Land Development Code Revisions to 6.3.3

Dear Nina,

I am in receipt of a referral request for comment on a Land Development Code Revision to 6.3.3, Fire Protection and Wildfire Mitigation. I have the following comments;

- Revisions will not affect CDOT infrastructure. No Comment.

However,

- On-premise and off-premise signing shall comply with the current Colorado Outdoor Advertising Act, sections 43-1-401 to 421, C.R.S., and all rules and regulations pertaining to outdoor advertising. Please contact Mr. Todd Ausbun at (719) 696-1403 for any questions regarding advertising devices.
- Any utility work within the state highway right of way will require a utility permit from the CDOT. Information for obtaining a utility permit can also be obtained by contacting Mr. Ausbun.

Please contact me in Pueblo at (719) 562.5537 with any questions.

Sincerely,

Michelle Regalado
CDOT R2 Access Management Trainee

Xc: Ferguson
Bauer/Patrol 9
Ausbun
Vigil/Gonzales/file



FALCON FIRE PROTECTION DISTRICT

7030 Old Meridian Road Falcon Colorado 80831

Business Number: 719-495-4050

Business Fax: 719-495-3112

www.falconfirepd.org



August 11, 2020

RE: Land Development Code Revisions to 6.3.3, Fire Protection and Wildfire Mitigation

Nina,

Thank you for the opportunity to reply to the proposed revisions to section 6.3.3 pertaining to fire in the land development code. For the most part, Falcon Fire has worked with and supports the comments that were provided by Mark Stanwood with the Ellicott Fire District.

Falcon Fire would like to expand on a few areas that have never been clear to us or the Developers we have worked with over the year.

6.3.3. (B) (1)

Fire Protection Report

This section actually has more in it now that it has been rewritten that seems to be better. Fire has never understood what this reports purpose is. What is done with the report by the county planners? For years now, most development companies have just used standard reports that contain the same information from the appropriate Districts that they have used for years. Most information is not accurate. In addition, Fire has no idea what the County is looking for or doing with this information. IF this information has no impact o the approval of any new development then I don't see the reason to require it. If a Fire District does not think they have the needed infrastructure, capabilities or equipment to support a proposed new development they have the opportunity to respond at the time of review and before giving a commit to serve letter.

(C)

(b) (i) and (ii) should just follow current code as written or adopted.

(C) (d) (i)

Fire Cisterns

This section has a lot of requirements that do not follow any known codes or standards.

Bullet point 1- Fire cistern should be required if there is no other fire water supply available. We strongly agree with this requirement.

Bullet point 2- Fire Cisterns should comply with standards and follow NFPA and ISO requirements. Insurance Services Office only recognizes a cistern of 30,000 gallon or more.

Bullet point 3 & 4- this is where the LDC gets confusing and no one in the development area or Fire knows where this comes form or how to determine it. There is really no difference in the standard on the number of cisterns required other than the Districts ability to haul water from

FALCON FIRE PROTECTION DISTRICT

7030 Old Meridian Road Falcon Colorado 80831

Business Number: 719-495-4050

Business Fax: 719-495-3112

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them and the travel distance they can haul that water. Cisterns should be required. The number should be determined using the standards and the Fire Districts based on their ability.

Bullet point 5 & 6 are good.

Apply to Stratmoor as well

Ellicott Fire Protection District Response with comments to Land Development Code Revisions to 6.3.3, Fire Protection and Wildfire Mitigation

First line:

Replace "Fire Marshal" with "Fire Authority" throughout.

First Line and First Paragraph:

Where is this found in the code?

The term "Fire Authority" is more correctly "Fire Authority Having Jurisdiction". I suggest using the Pikes Peak Regional Building Department definition:

*The PPRBD Regional Building Code Section 101 General provisions RBC 101.5 Definitions:
The Fire Authority – The applicable Fire Protection District or municipal Fire Department having Jurisdiction to adopt and enforce the Fire Code.*

Recommend changing the First Line and First Paragraph to:

Fire ~~Marshal~~ Authority — For purposes of this Code, ~~El Paso County Fire Marshal~~ the applicable Fire District or, Fire Department having Jurisdiction to adopt and enforce the Fire Code, within whose ~~their~~ boundaries the property lies, or a Third-Party Fire Reviewer for properties not located within the boundaries of a Fire District or Fire Department., "Fire Authority" may include the Sheriff's Office for certain fire events.

See above justification.

Third Party Fire Reviewer- a person with a minimum of an State of Colorado Inspector II, ICC or NFPA Certification who has provided El Paso County with a copy of such certification are qualified to provide comment, recommendations and approvals.

State of Colorado Inspector II meets or exceeds these other requirements.

Fireworks Sales

Fire Department Approval Required. ~~The fireworks sales area shall be located within an area provided with fire protection by a fire department. Fire department~~ Fire Authority approval is required prior to the approval of a temporary use permit.

I do not oppose this change however you may want to ensure there is fire protection coverage where there is no fire department to respond.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

A(2) Applicability.

This Section shall apply to all development applications and permits within the unincorporated areas of El Paso County without a fire code adopted and approved by the El Paso County Board of County Commissioners. The standards and requirements related to construction in wildland areas are applicable on all land within unincorporated El Paso County that is shown as forested on the Vegetation Map or to

areas identified in ~~the~~ a wildland fire risk and hazard mitigation plan, if required by the approval of that plan.

Section 6.3.3 Fire Protection and Wildfire Mitigation does not apply to areas of unincorporated El Paso County within the boundaries of a Fire Protection District with a Fire Code adopted and approved by the El Paso County Board of County Commissioners. The adopted Fire Code is a law with equal to, if not with more, authority than this code. The authority of the Fire Code and its enforcement is based upon state law. However this code as intended covers those Fire Protection Districts without an adopted fire code and those areas within the unincorporated El Paso County that are not in Fire Protection District.

EXCEPTION: construction in wildland areas applies whether or not a fire code has been adopted. Therefore this section of the code "construction in wildland areas" must be reviewed and enforced by the Planning and Community Development Director.

C.R.S. 32-1-1002. Fire protection districts - additional powers and duties.

32-1-1002 (1) (d) To adopt and enforce fire codes, as the board deems necessary, but no such code shall Apply within any municipality or the unincorporated portion of any county unless the governing body of the municipality or county, as the case may be, adopts a resolution stating that such code or specific portions thereof shall be applicable within the fire protection district's boundaries; except that nothing in this paragraph (d) shall be construed to affect any fire codes existing on June 30, 1981, which have been adopted by the governing body of a municipality or county. Notwithstanding any other provision of this section, no fire protection district shall prohibit the sale of permissible fireworks, as defined in section 12-28-101 (8), C.R.S., within its jurisdiction.

32-1-1002 (3) (b) The chief of the fire department in each fire protection district shall:

32-1-1002 (3) (b) (II) (A) Inspect, or cause to be inspected by members or officers of his department, as often as he shall deem necessary, all buildings, premises, and public places, except the interior of any private dwelling, for the purpose of ascertaining and causing to be corrected any condition liable to cause fire or for the purpose of obtaining information relative to the violation of the various provisions of this subsection (3). Any individual conducting such inspection shall carry on his person properly authorized fire department identification which shall be shown, on request, to the owner, lessee, agent, or occupant of any structure prior to the inspection of the same.

32-1-1002 (3) (b) (II) (B) The chief of any such fire department or fire department members designated by the chief have the authority to enter into all structures and upon all premises within their respective jurisdictions at reasonable times during business hours or such times as such structures or premises are open for the purpose of examination in conformity with the duties imposed by this subsection (3), and it is unlawful for any person to interfere with the chief of any such fire department, or any member of such fire department designated by the chief to conduct an inspection, in the discharge of his duties or to hinder or prevent him from entering into or upon or from inspecting any buildings, establishments, enclosures, or premises in the discharge of his duties.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

A (3) Relationship to Other Standards.

Where a Fire ~~department Authority~~ has adopted a Fire Code standard approved by the El Paso County Board of Commisioners, the more restrictive shall apply. In the case of a conflict between the Fire ~~district Authority~~ standards (without an adopted Fire Code) and this code, the Fire ~~Marshal Authority~~ may approve an alternative design which accomplishes the purposes of this section and provides an equivalent or similar benefit to the property or the community. The El Paso County Planning and Community Development could make recommendations on alternative design on behalf of the

developer or contractor. If a developer or contractor disagrees with any disapproval by the Fire Authority they may appeal the decision to the El Paso County Board of County Commissioners and or seek remedies under Colorado State Law C.R.S. 32-1-1002.

The adopted and approved Fire code of a Fire Protection District is more stringent and supersedes this code. However, Fire Protection Districts without an adopted fire code do have authority to enforce this code and to apply the state law and other laws in regards to fire protection.

C.R.S. 32-1-1002. Fire protection districts - additional powers and duties.

32-1-1002 (1) (f) In areas of the special district where the county or municipality has rejected the adoption of a fire code submitted by the fire protection district, to compel the owners of premises, whenever necessary for the protection of public safety, to install fire escapes, fire installations, fireproofing, automatic or other fire alarm apparatus, fire extinguishing equipment, and other safety devices. This paragraph (f) shall not apply when a valid ordinance providing for fire safety standards, pursuant to section 30-15-401.5, C.R.S., is in effect.

32-1-1002 (3) (b) The chief of the fire department in each fire protection district shall:

32-1-1002 (3) (b) (I) Enforce all laws of this state and ordinances and resolutions of the appropriate political subdivisions relating to the prevention of fires and the suppression of arson;

Remedies under Colorado State Law C.R.S. 32-1-1002.

32-1-1002 (3) (c) Any such owner, lessee, agent, or occupant who feels himself aggrieved by any such order may file, within five days after the making of any such order, a petition with the district court of the county in which such premises or building is located, requesting a review of such order, and it is the duty of such court to hear the same at the first convenient day and to make such order in the premises as justice may require, and such decision shall be final

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

A(4) Responsibility of Fire Authority.

The Fire ~~Marshal~~ Authority shall have authority to enforce the provisions of this Section. It is the responsibility of the Fire Authority to provide recommendations as to whether a new development meets the applicable fire standards for the respective area. If a new development does not meet the applicable standards, then the fire authority should provide comments regarding areas of non-compliance and recommendations for achieving The compliance. The Fire ~~Marshal~~ Authority shall be authorized to develop and utilize forms and checklists to implement the requirements of this Section. In areas where a fire code has not been adopted and the Fire Authority has not commented in the allotted time frame it shall be the responsibility of the El Paso County Planning and Community Development to insure that the intent of this section is being complied with by the developer or contractor.

The Fire Authority does have the authority to enforce this code. However they also have the responsibility to make recommendations. Small rural all volunteer fire departments may not have the time, manpower and or expertise to review and make recommendations in the 2 week time frame given. Therefore the El Paso County Planning and Community Development should make an effort to ensure the intent of this section is being complied with when there is no review completed by the fire districts. FYI – some fire districts did not know this section of the code existed until recently.

32-1-1002 (3) (b) The chief of the fire department in each fire protection district shall:

32-1-1002 (3) (b) (I) Enforce all laws of this state and ordinances and resolutions of the appropriate political subdivisions relating to the prevention of fires and the suppression of arson;

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

B Reports and Commitments ~~Required~~ for Subdivisions.

B (1) Fire Protection Report.

A Fire Protection Report is required for any subdivision application and shall include the fire district's or fire department's capabilities, including existing and proposed equipment, facilities, services, and response time to provide fire protection for the proposed subdivision, an analysis of compliance with the Fire Protection and Wildfire Mitigation Section of this Code, and an analysis of compliance with the applicable fire code standards.

~~B (2) Fire Protection Commitment Required.~~ A written commitment to provide structural fire protection may be required for any proposed subdivision, and may be requested by the ~~Fire Marshal~~ Fire Authority for other development applications.

~~B (3) Mitigation Costs Included in Construction Financial Assurance. If the Board of County Commissioners determines that wildfire mitigation issues are significant enough in the determination of the Fire Marshal to require mitigation associated with development construction activities, the cost of the mitigation shall be included in the construction financial assurance. The Fire Authority may, at its discretion, choose to provide a recommendation to the Board of County Commissioners regarding whether the cost associated with performing wildfire mitigation is appropriate and should be secured and accounted for within the financial assurance estimate and associated collateral for the overall development.~~

~~B (4) Development Outside Fire District or Fire Department Boundaries. Proposed subdivisions outside the boundaries of a fire district or fire department shall annex into a department or provide evidence of a contract for service from a Fire District or Fire Department. Waivers of this requirement may only be approved by the Board of County Commissioners. An applicant's waiver request shall, at a minimum, include the following:~~

- ~~• A letter from the nearest fire district or fire department demonstrating that annexation is not economically feasible.~~
- ~~• A letter or report from a Third Party Fire Reviewer providing a recommendation to the Board of County Commissioners that the proposed development complies with the Fire Protection and Wildfire Mitigation Section of this Code. In the case of a conflict between adopted standards and this Code, the Third Party Fire Reviewer may recommend an alternative design which accomplishes the purposes of this section and provides an equivalent benefit to the development.~~

I am not opposed to the changes purposed for this section.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standards

(1) Water Supply

(a) General.

Water supply systems used for fire protection purposes shall be installed and maintained in accordance with NFPA standards. The required fire flow for one or more buildings of a planned building area (also referred to as the planned building group by the NFPA) shall be determined by the ~~Fire Marshal~~ Fire Authority using locally adopted codes, or as specified per the following conditions

Replace "Fire Marshal" with "Fire Authority" throughout.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standards

(1) Water Supply

(b) Automatic Fire Protection

~~(i) Commercial and Industrial Structures All commercial or industrial structures of more than 3 stories or over 40 feet in height above adjacent ground elevation shall be fully protected with an automatic sprinkler system. Automatic fire Protection shall be in compliance with the current adopted PPRBD Regional Building Code. This includes the sprinkler requirements for residential 1 & 2 family dwellings and townhomes under the IRC as well as all other commercial and multi-family residential dwellings under the International Building Code.~~

~~(ii) Multifamily Residential Structures. Any multifamily residential building containing more than 2 dwelling units shall have an automatic sprinkler system installed.~~

Should reference the Pikes Peak Regional Building Department adopted building code which includes changes to the IRC and IBC. Chapter 9 of the IBC is the same as Chapter 9 of the IFC. Keeping it simple.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(1) Water Supply

(c) Areas with Central Water Systems.

(iii) Fire Hydrant Spacing

Fire hydrants shall be located so that all residential structures are within ~~500~~ 600 feet and all nonresidential structures are within ~~150~~ 400 feet of a hydrant. Fire hydrants shall be installed adjacent to a road or emergency vehicle lane at a spacing not to exceed ~~660~~ 800 feet of vehicle travel distance. Where the proposed buildings warrant, the Fire ~~Marshal Authority~~ may ~~require allow fewer hydrants and greater spacing distance or require~~ additional hydrants and closer spacing based on applicable fire standard.

Fire Authority can increase or decrease the distance required.

507.5.1 Where required. Where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 400 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the fire code official.

Exceptions:

- 1. For Group R-3 and Group U occupancies, the distance requirement shall be 600 feet (183 m).*
 - 2. For buildings equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the distance requirement shall be 600 feet (183m).*
- Maximum Spacing may be reduced per IFC Appendix "C"*

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(1) Water Supply

(c) Areas with Central Water Systems.

(vi) Fire Hydrant Accessibility.

Fire hydrants shall be accessible to fire district or fire department apparatus from a road (i.e., maintained public roads, privately-maintained roads, or emergency vehicle access roads) or unobstructed emergency vehicle lanes (i.e., driveway, parking drive aisle, or emergency vehicle lane).

Add Fire District – FYI all county fire agencies are Fire Protection Districts.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(1) Water Supply

(c) Areas with Central Water Systems.

(vii) Fire Hydrant Relationship to Roads.

Fire hydrants shall be located within 6 feet of the edge of the pavement unless there is a conflict with the ECM or the Fire ~~Marshal~~ Authority determines another location is more acceptable for the fire district or fire department use. All roads and emergency vehicle lanes shall be designed to maintain a minimum unobstructed clearance of 3 feet around fire hydrants.

Replace “Fire Marshal” with “Fire Authority” throughout.

Add Fire District – FYI all county fire agencies are Fire Protection Districts.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(1) Water Supply

(c) Areas with Central Water Systems.

(ix) Release of Financial Assurance for Water Supply Systems

The contractor, installer, or owner of water supply systems shall demonstrate by testing that the capacity of the water supply system will meet fire protection design requirements prior to release of construction financial assurance for the system. The testing shall be certified by a qualified professional. The tests shall be provided to the Fire ~~Marshal~~ Authority if requested.

Replace “Fire Marshal” with “Fire Authority” throughout. Fire Authority should be requesting test certification documentation and maintaining on file. This must be done prior to prior to release of construction financial assurance.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(1) Water Supply

(d) Areas without Central Water Systems.

(i) Fire Cisterns.

Fire Cisterns Required: Fire cisterns shall be provided in planned building areas which are not served by hydrants, unless the Fire ~~Marshal~~ Authority has approved an alternative fire protection water supply system.

Replace “Fire Marshal” with “Fire Authority” throughout.

~~• Design Standards for Subdivisions with More than One Cistern: For subdivisions where more than one fire cistern is required, fire cisterns shall meet the requirements of the NFPA standards for water supplies for suburban and rural fire fighting. For this type of subdivision, fire cisterns shall be designed for the largest building allowed by zoning in the worst case hazard and construction class.~~

~~• Design Standards for Subdivisions with One Cistern: For subdivisions where only one fire cistern is required, the minimum capacity of the fire cistern shall meet the requirements of the NFPA standards on water supplies for suburban and rural fire fighting, or shall have a total capacity equal to 300 gallons for each acre within the subdivision plus 3,000 gallons per dwelling unit, whichever is greater.~~

• Design Standards for Subdivisions: Fire cisterns shall meet the applicable NFPA design criteria and Fire Authority requirements. Fire cisterns shall meet the requirements of the NFPA standards for water supplies for suburban and rural fire fighting. Minimum acceptable cistern size shall be 30,000 gallons. Cistern spacing shall be determined by the Fire Authority.

This was confusing, simplified to meet NFPA design criteria and standards. Minimum 30,000 Gallon Cistern per ISO, less than required by the IFC requirement, and meets National Standard minimum.

Cistern Turnaround: A dedicated turnaround shall be placed no more than 50 feet from a fire cistern, and the standpipe shall be within 8 feet of the nearest usable portion of the dedicated right-of-way or approved easement, unless otherwise approved by the applicable Fire ~~Marshal~~ Authority.

Replace "Fire Marshal" with "Fire Authority" throughout.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(1) Water Supply

(d) Areas without Central Water Systems.

(ii) Dry Hydrants.

Use of Dry Hydrants: Dry hydrants may be provided in combination with fire cisterns or other approved fire protection water supply systems. Plans for dry hydrants shall be submitted to and approved by the Fire ~~Marshal~~ Authority.

Replace "Fire Marshal" with "Fire Authority" throughout.

Visible: Dry hydrant locations shall be made visible from the main roadway during emergencies by reflective marking and signage ~~approved by the Fire Marshal and shall be in conformance with NFPA requirements~~. All identification signs shall be approved by the highway authority prior to installation if they are to be located on the right-of-way or are subject to State laws.

Per previous should conform to NFPA design standards.

Maintenance of Dry Hydrant: Dry hydrants shall be checked and maintained at least quarterly. Thorough surveys shall be conducted, to reveal any deterioration in the water supply situation in ponds, streams, or cisterns. Grass, brush, and other vegetation shall be kept trimmed and neat. Vegetation shall be cleared for a minimum 3 foot radius from around hydrants. The hydrant shall be painted as needed, with reflective material to maintain visibility during emergencies. The ownership and maintenance

responsibilities for the facilities shall be approved by the Fire ~~Marshal~~ Authority per NFPA Standards.

Replace "Fire Marshal" with "Fire Authority" throughout.

Per previous should conform to NFPA design standards.

Maps and Location/Detail Drawings: The ~~fire department (Fire Marshal)~~ Fire Authority and El Paso County Sherriff's Office ~~where there is no fire department~~ shall maintain in a safe location, the maps and records of dry hydrant system locations, installation, tests, inspections, maintenance and repairs. When the property is not within a Fire Protection District it is the responsibility of the property owner and El Paso County Sherriff's Office to maintain in a safe location, the maps and records of dry hydrant system locations, installation, tests, inspections, maintenance and repairs.

Replace "Fire Marshal" with "Fire Authority" throughout. Maps should be maintained.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(1) Water Supply

(d) Areas without Central Water Systems.

(iii) Water Supply Requirements

The owner of the cistern or dry hydrant is responsible for planning, developing, permitting, and continual provision of a sufficient water supply necessary to maintain the fire protection requirements of a cistern system, to the satisfaction of the Fire ~~Marshal~~ Authority.

Replace "Fire Marshal" with "Fire Authority" throughout.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(2) Roads

(e) Road Grades in Wildland Fire Areas

Within wildland fire areas, road grades steeper than 10 percent may be permitted where mitigation measures can be agreed on by the Fire ~~Marshal~~ Authority and the ECM Administrator.

Replace "Fire Marshal" with "Fire Authority" throughout.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(3) Non-Road Access

(c) Emergency Vehicle Lanes Required

Emergency vehicle lanes shall be provided as required by the Fire ~~Marshal~~ Authority.

Replace "Fire Marshal" with "Fire Authority" throughout.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(3) Non-Road Access

(h) Grades

Road grades steeper than 10 percent may be permitted where the Fire Authority and ECM Administrator Approve the mitigation measures as adequate, and the property owner agrees on the mitigation measures. Emergency vehicle lanes and required driveways shall not exceed 10 percent in grade unless steeper grades are allowed where mitigation measures can be agreed on by the Fire Marshal and the property owner.

Replace "Fire Marshal" with "Fire Authority" throughout. No objections to the 10% grade wording.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(3) Non-Road Access

(j) Turnouts and Turnarounds Required

(i) Driveways

Where the required driveway is greater than 300 feet, it shall be provided with turnouts or turnarounds at locations approved by the Fire ~~Marshal~~ Authority.

Replace "Fire Marshal" with "Fire Authority" throughout.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(3) Non-Road Access

(j) Turnouts and Turnarounds Required

(ii) Turnarounds Required

Dead-end emergency vehicle lanes in excess of 300 feet in length shall be provided with turnouts and turnarounds as approved by the Fire ~~Marshal~~ Authority. The turnaround at the terminus shall have a minimum radius of ~~50-96~~ feet. The Fire ~~Marshal~~ Authority shall be authorized to approve, as an alternative, a "120-hammerhead" or "60 FT Y" turnaround to provide emergency vehicles with a three-point turnaround.

Replace "Fire Marshal" with "Fire Authority" throughout.

Impossible to turnaround a 30 FT + fire truck in a 50 FT turnaround. IFC Minimum 96 FT and give the other alternatives.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

C Design Standard

(4) Gates.

(b) Locks.

Fire department personnel shall have ready access to locking mechanisms on a gate restricting access to a fire line. Proposed changes to access shall be approved by the Fire ~~Marshal~~ Authority.

Replace "Fire Marshal" with "Fire Authority" throughout.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

D Construction in Wildland Fire Areas.

(1) General.

(c) Maintenance of Property.

After construction, continued maintenance of the grounds and storage of combustible materials shall be performed to maintain these requirements, ~~as acceptable to the Fire Marshal.~~

Maintaince applicable standard; still enforceable by the Fire Authority.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

D Construction in Wildland Fire Areas.

(1) General.

(d) Location of Buildings and Building Envelopes.

Buildings located closer than 30 feet to a vegetated slope shall require special mitigation measures in accordance with NFPA 1144, Standard for Protection of Life and Property from Wildfire ~~as determined by the Fire Marshal.~~ Building envelopes shall not include gullies, fire chimneys, saddles, or other terrain conducive to wildfire spread.

Should be per NFPA standard.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

D Construction in Wildland Fire Areas.

(1) General.

(e) Roof Design and Materials.

Only roof covering assemblies rated Class A shall be used in a wildland area. The specific class shall be consistent with the wildland fire risk and hazard severity assessment ~~as determined by the Fire Marshal.~~

Should be per applicable standard.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

D Construction in Wildland Fire Areas.

(2) Wildland Fire and Hazard Mitigation Plan Required.

(b) Development of Plan.

(ii) Approval of ~~Fire Marshal~~ the Wildland Fire and Hazard Mitigation Plan.

The Fire ~~Marshal~~ Authority shall approve the mitigating measures relative to access, defensible space, water supply, and construction based on the relative risk and hazard rating, per the applicable fire standards.

Replace "Fire Marshal" with "Fire Authority" throughout.

Should be per NFPA standard.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

(D) Construction in Wildland Fire Areas.

(3) Wildland Fire Risk and Hazard Severity Analysis Required.

(d) Review of Wildland Fire Risk and Hazard Rating

The rating assignments developed to meet the requirements of this Code shall be reviewed by the Fire ~~Marshal Authority~~.

Replace "Fire Marshal" with "Fire Authority" throughout.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

(D) Construction in Wildland Fire Areas.

(4) No Permit or Approval Granted without Compliance

No permit or approval associated with development, construction or occupancy shall be approved or issued until the provisions of this standard are satisfied. Notwithstanding the foregoing, the Fire ~~Marshal Authority~~ in consultation with the Planning and Community Development Director shall have the authority to grant administrative variances to the design standards of this Section upon the finding of two or more of the following criteria:

Replace "Fire Marshal" with "Fire Authority" throughout.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

(D) Construction in Wildland Fire Areas.

(4) No Permit or Approval Granted without Compliance

- The fire protection district responsible for providing fire protection services to the project has adopted a fire code or recommended ~~with~~ a more stringent design standard from that contained herein;

Construction in Wildland Fire Areas is applicable whether there is an adopted fire code or not.

Recommend changing-

6.3.3 Fire Protection and Wildfire Mitigation

(D) Construction in Wildland Fire Areas.

(7) Combustible Materials.

Propane tanks and other combustible liquids storage shall conform to NFPA 30, Flammable and Combustible Liquids Code, NFPA 58, Liquefied Petroleum Gas Code, and the Wildland Fire Risk and Hazard Mitigation Plan. Other combustible materials shall be removed from the defensible space or stored in conformance with the approved fire protection plan ~~as approved by the Fire Marshal~~.

Should be per NFPA standard.

Replace "Fire Marshal" with "Fire Authority" throughout.

~~Fire Marshal Authority~~ — For purposes of this Code, El Paso County Fire Marshal, A the Fire District or, Fire Department within whose their boundaries the property lies, or a Third-Party Fire Reviewer for properties not located within the boundaries of a Fire District or Fire Department, "Fire Authority" may include the Sheriff's Office for certain fire events.

Third Party Fire Reviewer- a person with a minimum of an ICC or NFPA Certification who has provided El Paso County with a copy of such certification and who has self-certified that they are qualified to provide comment and recommendations.

Fireworks Sales

(A)

Sales Period Limited. Fireworks sales are limited to the period from May 31 "to July 6th each year.

(B)

~~Fire Department Approval Required. The fireworks sales area shall be located within an area provided with fire protection by a fire department. Fire department~~ Fire Authority approval is required prior to the approval of a temporary use permit.

(C)

Driveway Permit Required. A driveway permit shall be issued to allow access to the fireworks sales area prior to the approval of a temporary use permit.

(D)

Required Signage. A fireworks sales area shall post signage noting it is illegal to shoot fireworks within all towns and cities in El Paso County and violators will be prosecuted. Each fireworks sales area shall provide either one sign, with minimum 3 inch letter size, or 4 signs of 8½ by 11 inches, placed in a conspicuous location easily readable by the public, noting the language as stated or similar language approved by the PCD Director.

6.3.3. Fire Protection and Wildfire Mitigation

(A) General.

- (1) **Purpose and Intent.** To ensure that proposed development is reviewed in consideration of the wildfire risks and need to provide adequate fire protection in order to:

- Regulate development, buildings, and structures so as to minimize the hazard to public health, safety, and welfare;
- Ensure that adequate fire protection is available for new development;
- Implement wildfire hazard reduction in new development;

Commented [SDS1]: Recommend adding that the 3rd Party must be associated or otherwise accepted by a Fire Authority or other governing agency. I guess I'm trying to prevent someone off the street self certifying for some area/location without that area/location knowing about it. Hope that makes sense.

Commented [SDS2]: Probably should reword this to Fire Authority to keep consistency?

- Encourage voluntary efforts to reduce wildfire hazards; and
- Reduce the demands from the public for relief and protection of structures and facilities.

(2) **Applicability.** This Section shall apply to all development applications and permits within the unincorporated areas of El Paso County. The standards and requirements related to construction in wildland areas are applicable on land that is shown as forested on the Vegetation Map or to areas identified in ~~the a~~ wildland fire risk and hazard mitigation plan, if required by the approval of that plan.

(3) **Relationship to Other Standards.** ~~Where a conflict exists between adopted fire district or fire department standards and this Code, the Board of County Commissioners may choose to approve an alternative design which accomplishes the purpose of this section and provides an equivalent benefit to the development. Where a fire department has adopted standards, the more restrictive shall apply. In the case of a conflict between adopted fire district standards and this code, the Fire Marshal~~ The Fire Authority should approve provide a recommendation regarding whether the an alternative design which accomplishes the intent of this section and whether it provides an equivalent or similar benefit to the the development property or the community.

(4) **Responsibility of Fire Authority.** ~~The Fire Marshal shall have authority to enforce the provisions of this Section. The Fire Marshal shall be authorized to develop and utilize forms and checklists to implement the requirements of this Section. It is the responsibility of the Fire Authority to provide recommendations as to whether a new development meets the applicable fire code standards for the respective area. If a new development does not meet the applicable standards, then the fire authority should provide comments regarding areas of non-compliance and recommendations for achieving compliance.~~

(5) **Basis of Standards.** The basis of the standards in this Section is the most current standards adopted by the National Fire Protection Agency (NFPA) and the Colorado State Forest Service (CSFS).

(6) **Wildfire Hazard Maps/Vegetation Map.** El Paso County shall maintain a Vegetation Map depicting wildfire hazard areas of the County either based on vegetation type or wildfire hazard analysis, which shall be the official map for the purposes of applying this Section.

(B) **Reports and Commitments Required for Subdivisions.**

(1) **Fire Protection Report.** A Fire Protection Report is required for any subdivision application and shall include the fire district's or fire department's capabilities, including existing and proposed equipment, facilities, services, and response time to provide fire protection for the proposed subdivision, an analysis of compliance with the Fire Protection and Wildfire Mitigation Section of this Code, and an analysis of compliance with the applicable fire code.

Commented [SD53]: Fire Authority?

(2) **Fire Protection Commitment Required.** A written commitment to provide structural fire protection may be required for any proposed subdivision; and may be requested by the ~~Fire Marshal~~ Fire Authority for other development applications].

(3) **Mitigation Costs Included in Construction Financial Assurance.** ~~— If the Board of County Commissioners determines that wildfire mitigation issues are significant enough in the determination of the Fire Marshal to require mitigation associated with development construction activities, the cost of the mitigation shall be included in the construction financial assurance. The Fire aAuthority may, at its discretion, choose to provide a recommendation to the Board of County Commissioners regarding whether the cost associated with performing wildfire mitigation is appropriate and should be secured and~~

Commented [SD54]: Doesn't quite make sense to me... the first part reads as if this is may be required by the county... to ensure the capabilities of the local fire response as compared to the proposed development. However the last part seems to indicate that a Fire Authority can ask the Fire Authority (aka themselves?) for such a commitment.

accounted for within the financial assurance estimate and associated collateral for the overall development.

(4) Development Outside Fire District or Fire Department Boundaries. Proposed subdivisions outside the boundaries of a fire district or fire department shall annex into a department or provide evidence of a contract for service from a Fire District or Fire Department. Waivers of this requirement may only be approved by the Board of County Commissioners. An applicant's waiver request shall, at a minimum, include the following:

- A letter from the nearest fire district or fire department demonstrating that annexation is not economically feasible.

- A letter or report from a Third Party Fire Reviewer providing a recommendation to the Board of County Commissioners that the proposed development complies with the Fire Protection and Wildfire Mitigation Section of this Code. In the case of a conflict between adopted standards and this Code, the Third Party Fire Reviewer may recommend an alternative design which accomplishes the purposes of this section and provides an equivalent benefit to the development.

(4) **Plat Notes Required.** Notice of any wildfire mitigation issues or obligations may be required by the County through conditions of approval or notes placed on the face of the plat.

(C) **Design Standards.**

(1) **Water Supply.**

(a) **General.** Water supply systems used for fire protection purposes shall be installed and maintained in accordance with NFPA standards. The required fire flow for one or more buildings of a planned building area (also referred to as the planned building group by the NFPA) shall be determined by the ~~Fire Marshal~~ Fire Authority using locally adopted codes, or as specified per the following conditions:

- For areas without municipal-type water systems, NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting, shall be applied.

- For those areas with municipal-type water systems, nationally recognized criteria shall be applied.

(b) **Automatic Fire Protection.**

(i) ~~Commercial and Industrial Structures. All commercial or industrial structures of more than 3 stories or over 40 feet in height above adjacent ground elevation shall be fully protected with an automatic sprinkler system.~~

~~(ii) Multifamily Residential Structures. Any multifamily residential building containing more than 2 dwelling units shall have an automatic sprinkler system installed. Automatic fire protection shall be in compliance with the applicable adopted fire code.~~

(c) **Areas with Central Water Systems.**

(i) **Water Distribution System Pressure.** The water distribution system shall be capable of delivering the required fire flow at a minimum rating of 20 pounds per square inch for each hydrant connected to the distribution system within the proposed subdivision.

(ii) **Dead-End Mains.** Dead-end mains shall not exceed 600 feet in length for main sizes less than 10 inches in diameter.

Commented [SDS5]: Fire Authority?

Commented [SDS6]: Fire Authority?

Commented [SDS7]: Fire Authority?

Commented [SDS8]: Fire Authority?

Commented [SDS9]: Fire Authority?

Commented [SDS10]: Fire Authority?

Commented [SDS11]: My recommendation

(iii) Fire Hydrant Spacing. Fire hydrants shall be located so that all residential structures are within 500 feet and all nonresidential structures are within 150 feet of a hydrant. Fire hydrants shall be installed adjacent to a road or emergency vehicle lane at a spacing not to exceed 660 feet of vehicle travel distance. Where the proposed buildings warrant, the ~~Fire Marshal~~Fire Authority may ~~require~~ recommend additional hydrants and closer spacing.

(iv) Fire Hydrant Accessibility. Fire hydrants shall be accessible to fire district or fire department apparatus from a road (i.e., maintained public roads, privately-maintained roads, or emergency vehicle access roads) or unobstructed emergency vehicle lanes (i.e., driveway, parking drive aisle, or emergency vehicle lane) capable of supporting the imposed weights of the Fire Authorities apparatus.

Commented [SDS12]: Fire Authority?

Commented [SDS13]: My recommendation

(v) Fire Hydrant Supply Lines. Fire hydrants shall be supplied by not less than a 6 inch diameter main installed on a looped system, or by not less than an 8 inch diameter main if the system is not looped or the fire hydrant is installed on a dead-end main exceeding 300 feet in length.

(vi) Fire Hydrants in Parking Areas. Fire hydrants located in parking areas shall be protected by barriers that will prevent physical damage from vehicles without obstructing hydrant operation.

(vii) Fire Hydrant Relationship to Roads. Fire hydrants shall be located within 6 feet of the edge of the pavement unless there is a conflict with the ECM or the ~~Fire Marshal~~Fire Authority determines—recommends another location is more acceptable for ~~fire district or fire department use~~. All roads and emergency vehicle lanes shall be designed to maintain a minimum unobstructed clearance of 3 feet around fire hydrants.

Commented [SDS14]: What is this? Where is this spelled out?

Commented [SDS15]: The definition of Fire Authority includes fire district or fire department. So this sounds redundant and unnecessary.

(viii) Fire Hydrant Easements. Easements for fire hydrants shall be provided and dedicated to the appropriate fire or water authority when the hydrants are not within a public road right-of-way. The easement shall afford accessibility to the hydrant from the right-of-way.

(ix) Release of Financial Assurance for Water Supply Systems. The contractor, installer, or owner of water supply systems shall demonstrate by testing that the capacity of the water supply system will meet fire protection design requirements prior to release of construction financial assurance for the system. The testing shall be certified by a qualified professional. The tests ~~shall~~may be provided to the ~~Fire Marshal~~Fire Authority.

Commented [SDS16]: I recommend keeping this as "shall" so as to allow the Fire Authority the benefit of knowing which systems have met requirements.

(d) **Areas without Central Water Systems.**

(i) Fire Cisterns.

- Fire Cisterns Required: Fire cisterns shall be provided in planned building areas which are not served by hydrants, unless the ~~Fire Marshal~~Fire Authority has recommended and the approval authority has approved an alternative fire protection water supply system.

- Construction Standards: Construction of fire cisterns shall be in accordance with the approved plans and conform to the requirements of the NFPA standard on water supplies for suburban and rural fire fighting.

- Design Standards for Subdivisions with More than One Cistern: For subdivisions where more than one fire cistern is required, fire cisterns shall meet the requirements of the NFPA standards for water supplies for suburban and rural fire fighting. For this type of subdivision, fire cisterns

shall be designed for the largest building allowed by zoning in the worst case hazard and construction class.

- **Design Standards for Subdivisions with One Cistern:** For subdivisions where only one fire cistern is required, the minimum capacity of the fire cistern shall meet the requirements of the NFPA standards on water supplies for suburban and rural fire fighting, or shall have a total capacity equal to 300 gallons for each acre within the subdivision plus 3,000 gallons per dwelling unit, whichever is greater.
- **Cistern Turnaround:** A dedicated turnaround shall be placed no more than 50 feet from a fire cistern, and the standpipe shall be within 8 feet of the nearest usable portion of the dedicated right-of-way or approved easement, unless otherwise ~~recommended approved~~ by the applicable ~~Fire Marshal~~ Fire Authority and approved by the approval authority.
- **Easements Required:** Fire cistern easements shall be provided and dedicated to the appropriate fire department to afford accessibility of the cistern from a public road. Easements shall be of sufficient size to facilitate maintenance.

(ii) Dry Hydrants.

- **Use of Dry Hydrants:** Dry hydrants may be provided in combination with fire cisterns or other approved fire protection water supply systems. Plans for dry hydrants shall be submitted to ~~and approved by the Fire Marshal~~ the Fire Authority for recommendation and approved by the approval authority.
- **Construction Standards:** Construction and installation of dry hydrants shall be in accordance with the approved plans and conform to the requirements of the NFPA standards on water supplies for suburban and rural fire fighting.
- **Accessible:** Dry hydrants shall be located to be accessible under all weather conditions.
- **Clearance:** Dry hydrants shall have a minimum clearance of 20 feet on each side and be located a minimum of 100 feet from any structure. Highway or road traffic shall not be impaired during the use of the dry hydrant.
- **Protected:** Dry hydrants shall be protected from damage by vehicular and other perils, including freezing and damage from ice and other objects.
- **Visible:** Dry hydrant locations shall be made visible from the main roadway during emergencies by reflective marking and signage ~~approved by the Fire Marshal and shall be in conformance with the NFPA requirements~~. All identification signs shall be approved by the highway authority prior to installation if they are to be located on the right-of-way or are subject to State laws.
- **Access to Hydrant:** Vehicle access shall be designed and constructed to support the heaviest vehicle.

Commented [SDS17]: Reads better without "the"

Commented [SDS18]: This leaves it wide open. Recommend limiting it to the heaviest apparatus of the Fire Authority or water purveyor, whichever is greater.

- **Maintenance of Dry Hydrant:** Dry hydrants shall be checked and maintained at least quarterly. Thorough surveys shall be conducted, to reveal any deterioration in the water supply situation in ponds, streams, or cisterns. Grass, brush, and other vegetation shall be kept trimmed and neat. Vegetation shall be cleared for a minimum 3 foot radius from around hydrants. The hydrant shall be painted as needed, with reflective material to maintain visibility during emergencies. The Fire Authority may make a recommendation regarding the ownership and maintenance responsibilities for the facilities. The approval authority will approve the ownership and maintenance responsibilities for the facilities shall be approved by the Fire Marshal.

- **Maps and Location/Detail Drawings:** The fire department (Fire Marshal Fire Authority and El Paso County Sheriff's Office where there is no fire department) shall maintain in a safe location, the maps and records of dry hydrant system locations, installation, tests, inspections, maintenance and repairs. When the property is not within a Fire Protection District it is the responsibility of the property owner and El Paso County Sheriff's Office to maintain in a safe location, the maps and records of dry hydrant system locations, installation, tests, inspections, maintenance and repairs.

- **Easements Required:** Dry hydrant easements shall be provided and dedicated to the appropriate fire department (or County where there is no fire department) to afford accessibility of the dry hydrant from a public road. Easements shall be of sufficient size to facilitate maintenance.

- (iii) **Water Supply Requirements.** The owner of the cistern or dry hydrant is responsible for planning, developing, permitting, and continual provision of a sufficient water supply necessary to maintain the fire protection requirements of a cistern system, to the satisfaction of the Fire approval authority Marshal with recommendation by the Fire Authority.

(2) **Roads.** This Section shall apply to all roads providing access to a planned building area whether or not they are dedicated as public roads.

- (a) **Roads Constructed to County Standards.** All roads, including private roads and emergency vehicle access roads, shall be designed and constructed according to this Code and the ECM. Emergency vehicle access roads shall, at a minimum, be constructed to the County's gravel road standard if open to the public. Emergency vehicle access roads which are not open to public travel shall meet the non-road access standards
- (b) **Roads within 150 Feet of Development.** Roads or emergency vehicle lanes shall be provided within 150 feet of all development except single family residential development.
- (c) **Two Access Routes Required.** Access to a planned building area shall be provided by a minimum of 2 separate routes in accordance with the requirements of this Code and the ECM if the cul-de-sac exceeds the length allowed by the ECM.
- (d) **Turnaround Required on Dead-End Roads.** Every dead-end road more than 300 feet in length shall be provided with a roadway termination meeting ECM standards.
- (e) **Road Grades in Wildland Fire Areas.** Within wildland fire areas, road grades steeper than 10 percent may be permitted where the Fire Authority and ECM Administrator recommend that the mitigation measures can be agreed on by the are adequate and the approval authority approves the mitigation measurements Fire Marshal and the ECM Administrator.

- (3) **Non-Road Access.** The following minimum standards shall apply to emergency vehicle lanes, driveways, and parking lot drive lanes serving as emergency vehicle lanes.
- (a) **Emergency Access Provided.** Access for emergency responders, ingress, egress, and evacuation shall be provided for all buildings.
 - (b) **Driveways Required.** Where any point of a building is greater than 150 feet from a road, a driveway meeting these standards shall be provided to within 150 feet of the furthest point on the building.
 - (c) **Emergency Vehicle Lanes Required.** ~~The Fire Authority may recommend emergency vehicle lanes be provided.~~ Emergency vehicle lanes shall be provided as required by the ~~Fire approval authority~~ Marshal.
 - (d) **Emergency Access Lane Design.** An emergency vehicle lane shall be designed and constructed to enable fire-fighting apparatus to maneuver broadside or directly forward within a minimum of 5 feet and a maximum of 25 feet of structures.
 - (e) **Width of Driveway and Emergency Vehicle Lanes.** Where the driveway is greater than 150 feet in length, it shall be not less than 10 feet in unobstructed width. Emergency vehicle lanes providing one-way travel shall be a minimum of 16 feet in width, and fire lanes with two-way travel shall be a minimum of 24 feet in width.
 - (f) **Vertical Clearance.** At least 13 feet 6 inches of vertical clearance shall be provided and maintained over the full width of an emergency vehicle lane or driveway.
 - (g) **Turns.** Required driveways shall be designed, constructed, and maintained to accommodate the turning radius of the largest apparatus typically used to respond to that location. A turn in an emergency vehicle lane shall be constructed with a minimum radius of 25 feet at the inside curb line and a minimum radius of 50 feet at the outside curb line.
 - (h) **Grades.** ~~Road grades steeper than 10 percent may be permitted where the Fire Authority and ECM Administrator recommend that the mitigation measures are adequate and the approval authority approves the mitigation measurements. Emergency vehicle lanes and required driveways shall not exceed 10 percent in grade unless steeper grades are allowed where mitigation measures can be agreed on by the Fire Marshal and the property owner.~~
 - (i) **Emergency Vehicle Lanes Connecting to Roads.** Emergency vehicle lanes connecting to roads shall be provided with curb cuts extending at least 2 feet beyond each edge of the fire lane.
 - (j) **Turnouts and Turnarounds Required.**
 - (i) Driveways. Where the required driveway is greater than 300 feet, it shall be provided with turnouts or turnarounds at locations approved by the ~~Fire Marshal~~ approval authority with recommendation from the Fire Authority.
 - (ii) Turnarounds Required. ~~The fire authority may provide a recommendation regarding turnarounds.~~ Dead-end emergency vehicle lanes in excess of 300 feet in length shall be provided with turnouts and turnarounds as approved by the ~~Fire Marshal~~ approval authority. The turnaround at the terminus shall have a minimum radius of 50 feet. The ~~Fire Marshal~~ approval authority shall be authorized to approve, as an alternative, a "hammerhead" turnaround to provide emergency vehicles with a three-point turnaround.
 - (k) **Load Design.** Emergency vehicle lanes and required driveways shall be designed, constructed, and maintained to accommodate the load of the largest apparatus typically used to respond to that location.
 - (l) **Bridges or Drainage Crossings.** A bridge or drainage crossing on an emergency vehicle lane or required driveway shall be designed to accommodate the load of the

largest apparatus typically used to respond to that location. The load limit shall be clearly posted at the approaches to the bridge.

- (m) **Landscaping Maintained.** Landscaping or other obstructions shall be maintained in a manner that provides unobstructed access for fire department operations.

(4) **Gates.**

- (a) **Gate Location and Dimensions.** Gates shall be located a minimum of 30 feet from the public right-of-way and shall not open outward. The opening provided through a gate shall be 2 feet wider than the traveled way.
- (b) **Locks.** Fire department personnel shall have ready access to locking mechanisms on a gate restricting access to a fire line. Proposed changes to access shall be approved by the Fire Marshal Fire Authority.

Commented [SD519]: Fire Authority?

(D) **Construction in Wildland Fire Areas.**

(1) **General.**

- (a) **Applicability.** All structures potentially threatened by wildland fire shall be designed, located, and constructed to comply with this Section.
- (b) **Risk Assessment Required.** A wildland fire risk hazard severity assessment shall be performed for all structures and groups of structures adjacent to wildland fuels.
- (c) **Maintenance of Property.** After construction, continued maintenance of the grounds and storage of combustible materials shall be performed to maintain these requirements ~~as acceptable to the Fire Marshal~~.
- (d) **Location of Buildings and Building Envelopes.** Buildings located closer than 30 feet to a vegetated slope shall require special mitigation measures in accordance with NFPA 1144, Standard for Protection of Life and Property from Wildfire ~~as determined by the Fire Marshal~~. Building envelopes shall not include gullies, fire chimneys, saddles, or other terrain conducive to wildfire spread.
- (e) **Roof Design and Materials.** Only roof covering assemblies rated Class A shall be used in a wildland area. The specific class shall be consistent with the wildland fire risk and hazard severity assessment ~~as determined by the Fire Marshal~~.
- (f) **Accessory Structures.** Outbuildings, patio covers, gazebos, and other accessory structures shall be separated from the main structure by a minimum of 30 feet.
- (g) **Access to Structures.** At least one approved means of vehicular access shall be provided to each structure or other nonstructural fire hazard in accordance with the following:
 - (i) For structures or nonstructural fire hazards exceeding two stories or 30 feet in height above average adjacent ground level, or 12,000 square feet of gross floor area, no less than 2 separate approved means of access shall be provided.
 - (ii) Approved vehicular access shall be provided to within 150 ft of any point of the exterior wall of each structure.
- (h) **Access to Structures Not Protected by Automatic Sprinklers.** An approved means of vehicular access shall be provided to within 30 feet of all points of at least 2 exterior walls for any structure not protected by automatic sprinklers that exceeds 2 stories or 30 feet in height above average adjacent ground elevation. Single and two-family dwellings are exempt from this requirement.
 - (i) **Access to Structures Protected by Automatic Sprinklers.** For any structure protected by an automatic sprinkler system, an approved means of vehicular access shall be provided to within 400 feet of any point of the exterior wall. For any structure exceeding 3 stories or 35 feet in height above average adjacent

ground elevation and protected by an automatic sprinkler system, an approved means of vehicular access shall be provided to within 30 feet of all points of at least 2 exterior walls.

- (j) **Separation Between Structures.** A structure in a planned building area shall be separated from another structure by at least 30 feet and shall be located at least 25 feet from a lot, parcel, or tract line. A structure in a planned building area that exceeds 2 stories or 30 feet in height above average adjacent ground elevation and is not protected by an automatic sprinkler system shall be separated from other structures by at least 50 feet and shall be located at least 25 feet from a lot, parcel, or tract line.

(2) **Wildland Fire and Hazard Mitigation Plan Required.**

(a) **General Plan Standards and Requirements.**

When a subject lot, parcel, or tract falls within a wildland fire area, a wildland fire risk and hazard mitigation plan shall be prepared by a qualified professional and shall be tailored to the stage of development application and the stage of subdivision-related construction. A higher level of plan may be submitted at any stage of the process so long as it is implemented at the final stage of development. Plans shall utilize the Colorado State University (CSU) Guidelines and NFPA standards, as applicable. Additional fire precaution measures may be required because of fire hazard in the following areas:

- (i) Areas depicted as forested on the Vegetation Map;
- (ii) Areas rated as fire hazards by the CSFS;
- (iii) Where slopes in or adjacent to proposed development are in excess of 20%; or
- (iv) Where the local fire protection agency identifies a specific fire danger.

(b) **Development of Plan.**

- (i) General Mitigation Plan Requirements. This plan shall include, but not be limited to, the following:

- Access, ingress, egress, and evacuation;
- Fuel modification;
- Water supply;
- Construction, location, and design of structures; and
- Ignition potential.

- (ii) Approval of ~~Fire Marshal~~ Wildland Fire and Hazard Mitigation Plan. The ~~Fire Marshal~~ Approval Authority with recommendations from the Fire Authority shall approve the mitigating measures relative to access, defensible space, water supply, and construction based on the relative risk and hazard rating.

Commented [SDS20]: Shouldn't the Fire Authority have some say?

(3) **Wildland Fire Risk and Hazard Severity Analysis Required.**

- (a) **Risk Assessment to be Performed.** A risk and hazard rating analysis shall be performed to determine the level of the wildland fire threat to life and values at risk prior to building permit authorization in high hazard areas unless completed as part of the wildland fire and hazard mitigation plan.

- (b) **Basis for Mitigation Measures.** The risk and hazard ratings shall be the basis for the implementation of mitigation measures relative to vegetation, other combustibles, and construction criteria.
- (c) **Analysis Rating Factors.** The following shall be considered in analyzing the risk factors:
 - The history of local wind, relative humidity, temperature, and fine fuel moisture content shall be considered in determining defensible space.
 - All vegetative fuels and other combustible materials shall be evaluated for their potential to contribute to the intensity and spread of wildland fire.
 - Slope and aspect shall be evaluated as to their potential to increase the threat of wildland fire to life or improved lot, parcel, or tract.
 - The factors determining required defensible space shall include the history of wildland fire for the area.
 - Fire-safe routes for emergency service apparatus and for egress shall be evaluated.
 - Other factors that can affect the risk of ignition or the spread of wildland fire on improved lot, parcel, or tract, including the risk of structure fires spreading to vegetation, shall be part of the analysis.
- (d) **Recommendationview of Wildland Fire Risk and Hazard Rating.** The rating assignments developed to meet the requirements of this Code ~~shall may~~ be reviewed by the ~~Fire Marshal~~Fire Authority who may provide a recommendation regarding the rating.
- (4) **No Permit or Approval Granted without Compliance.** No permit or approval associated with development, construction or occupancy shall be approved or issued until the provisions of this standard are satisfied. Notwithstanding the foregoing, the ~~Fire Marshal~~Planning and Community Development Director shall have the authority to grant administrative variances to the design standards of this Section upon the finding of two or more of the following criteria:
 - The fire ~~district or fire protection district~~authority responsible for providing fire protection services, ~~as applicable,~~ to the project has adopted a fire code with a more stringent design standard from that contained herein;
 - The application of a design standard will cause undue hardship or practical exceptional difficulties; or
 - An alternate design standard will satisfy the intent and meet the goals of these Fire Protection and Wildfire Mitigation Regulations.
- (5) **Defensible Space Requirements.**
 - (a) **General.** The Defensible Space Requirements in Table 6.8 shall be implemented as minimum requirements in association with development in any Wildland Fire Area.

Table 6-8. Defensible Space Clearing and Structural Summary (Recommendations from NFPA by Wildland Fire Hazard Severity Analysis)

Low Hazard	High Hazard
9.14 m (30 ft) clearance. Class A roof. No portion of trees or other vegetation within 3.048 m (10 ft) of chimney outlets. Trees within defensible space shall be pruned to minimize ladder fuels.	9.14 m (30 ft) irrigated. Class A roof. 30.48 m (100 ft) fuel treatment. Noncombustible siding/decks, and boxed eaves. Selected fire-resistant trees within 9.1 m (30 ft) of structures. Selected thinning of trees and shrubs. Trees within defensible space shall be pruned to minimize ladder fuels. All trees and shrubs pruned of dead material. No portion of trees or other vegetation within 3.48 m (10 ft) of chimney outlets.

- (b) **Maintenance of Defensible Space and Associated Fuel Break Thinning.** Defensible space and fuel break thinning work shall be completed and maintained to the standards described in the Colorado State University's Cooperative Extension Fact Sheet 6.302. The responsibility for maintaining defensible space and associated fuel break thinning lies with the landowner. Noncompliance with defensible space maintenance standards will be enforced as a zoning violation.

(6) **Fuels Modification During Development and After Construction.**

- (a) **Identification of Modification Required.** Identification of fuel modification measures may be required in order to reduce the threat of wildfire. If fuel modification is determined to be necessary, the plan shall be prepared by a qualified professional. A fuel modification plan shall comply with NFPA requirements. Required elements shall include but are not limited to the following:

- Identification of fuel type, volume and loading, in conjunction with an assessment of slope and aspect, to determine the ability for a wildfire to spread;
- Reduction of fuel loading and modification of fuel types to reduce the risk to structures or adjacent vegetation, including the creation of fuel breaks; and
- Creation of defensible space to protect structures from approaching wildfire and reduce the potential for turning a structure fire into a wildfire.

- (b) **Fuel Modification Standards.** When the Wildland Fire Risk and Hazard Mitigation Plan requires establishment of a fuel modification area:

- The modifications shall extend at least 30 feet from structures;
- Ground fuels within the defined defensible space shall be treated or removed;
- Live vegetation within the defensible space shall have dead material removed and shall be thinned and pruned;
- Dead or downed fuels within the defensible space of buildings shall be removed or treated to maintain the fuel modification area;
- Vegetation under trees within the fuel modification area shall be maintained at a height that will preclude ground fire from spreading in the tree crown;
- The fuel modification plan shall include a maintenance element with the responsibility for maintenance defined;
- In these areas all slash (fallen trees, shrubs, pulled stumps, and other combustible materials) may be required to be disposed of from an area extending to at least 150 feet from the road centerline prior to the acceptance of any roads;
- All slash shall also be removed from the vicinity of the home sites prior to final building inspection; and
- Continuous proper forest management to maintain a low wildfire danger shall be guaranteed.

- (7) **Combustible Materials.** Propane tanks and other combustible liquids storage shall conform to NFPA 30, Flammable and Combustible Liquids Code, NFPA 58, Liquefied Petroleum Gas Code, and the Wildland Fire Risk and Hazard Mitigation Plan. Other combustible materials shall be removed from the defensible space or stored in conformance with the fire protection plan ~~as approved by the Fire Marshal.~~



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December 7, 2020

Nina Ruiz, El Paso County Planning Manager
El Paso County Planning & Community Development

RE: Proposed Fire District Revisions to Chapter 6 of the Land Development Code

On behalf of the Housing & Building Association of Colorado Springs (CSHBA), we would like to thank you for giving us the opportunity to review and comment on the proposed amendments to Chapter 6 of the Land Development Code in regards specifically to Section 6.3.3, Fire Protection and Wildlife Mitigation.

After a thorough review by our members and open discussions with the County, no further comments need to be considered. We hope the changes will provide support to the County for plans that require fire review and approval. Members still have a few minor concerns and look forward to working with the County on any needed changes after implementation.

Please call us with questions.

Sincerely,

Phil Stuepfert
HBA Land Use Chair
Housing and Building Association of Colorado Springs

APPENDIX B

CSFS Colorado Wildfire Risk Public Viewer Map Theme Descriptions



Colorado Wildfire Risk Public Viewer

Map Theme Descriptions

The purpose of this document is to explain each of the available map themes/ layers that users can select in the Colorado Wildfire Risk Public Viewer.



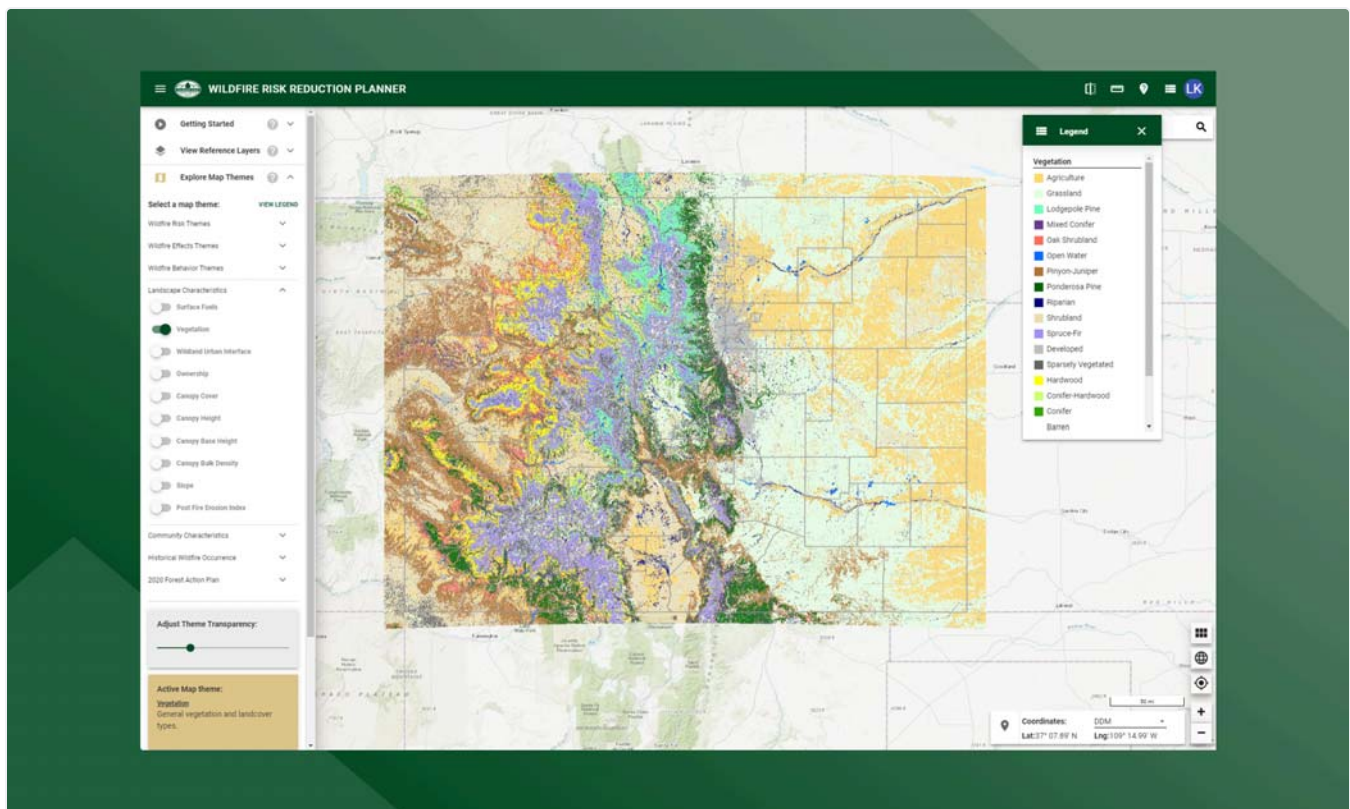
Vegetation

General vegetation and land cover types.

The Vegetation map describes the general vegetation and landcover types across the state of Colorado.

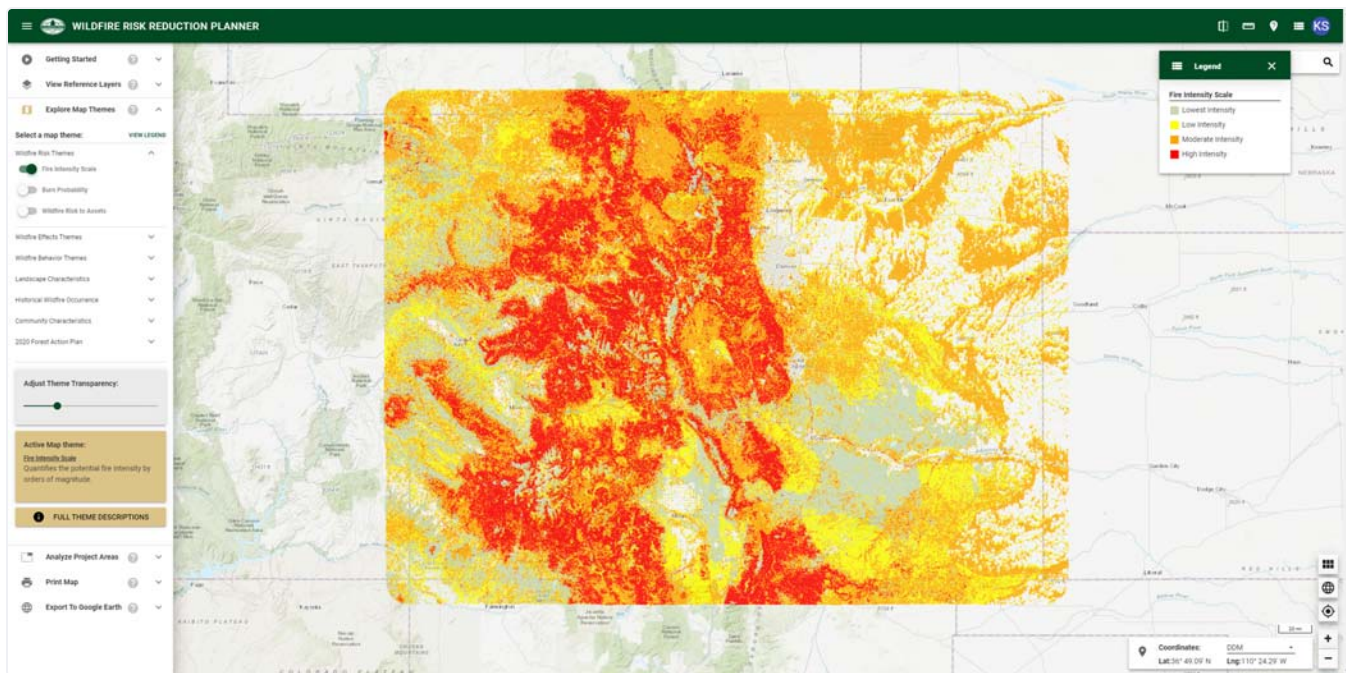
In the CO-WRA, the Vegetation dataset is used to support the development of the Surface Fuels, Canopy Cover, Canopy Stand Height, Canopy Base Height, and Canopy Bulk Density datasets.

The 2020 LANDFIRE program data product (Existing Vegetation Type) was used to compile the Vegetation data for the CO-WRA. This reflects data current to 2020. The LANDFIRE EVT data were classified to reflect general vegetation cover types for representation with CFA.





Fire Intensity Scale



Fire Intensity Scale (FIS) specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist. Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS in Colorado consists of four (4) classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents lowest wildfire intensities and the maximum class, Class 4, represents the highest wildfire intensities.

1. **Class 1, Lowest Intensity:** Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
2. **Class 2, Low:** Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

3. **Class 3, Moderate:** Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
4. **Class 4, High:** Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

Since all areas in Colorado have fire intensity scale calculated consistently, it allows for comparison and ordination of areas across the entire state. For example, a high fire intensity area in Eastern Colorado is equivalent to a high fire intensity area in Western Colorado.

Fire intensity scale is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography – and the spread itself (back, flank or head fire influences fire behavior for a given pixel for a specific fire simulation). Weather is by far the most dynamic variable as it changes frequently. Thus, each pixel may burn many times with different fire spread patterns based on the aforementioned factors. The fire intensity scale maps represent an average fire intensity map.

The fire intensity scale map is derived at a 20-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.



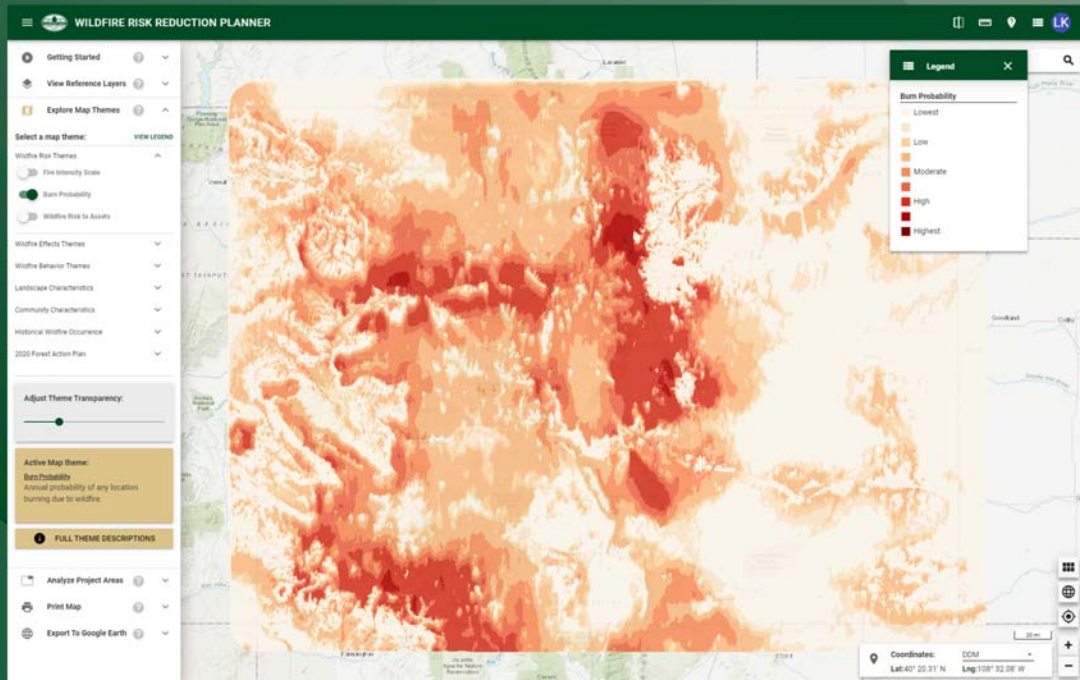
Burn Probability

Burn Probability (BP) is the annual probability of any location burning due to a wildfire.

The annual BP was calculated as the number of times that a cell was burned and the number of iterations used to run the models. The annual BP was estimated for Colorado by using a stochastic (Monte Carlo) wildfire simulation approach with Technosylva's Wildfire Analyst software (www.WildfireAnalyst.com). A total number of 2,342,334 fires were simulated (3,200,000 if we consider those fires outside the Colorado border which were used in a buffer area around the study area to compute BP) with a mean ignition density of 8.68 fires/km². The ignition points were spatially distributed evenly every 500 meters across the state. Only high and extreme weather conditions were used to simulate each ignition because these conditions account for the vast majority of the annual acres burned. All fire simulations had a duration of 10 h. After simulating all the fires, some cells were not burned by any simulated fire, resulting in a BP value of zero. Some cells were nonburnable due to the associated fuel type (water, roads, towns, agricultural areas, etc.). However, the lowest BP value found in 'burnable' cells was assigned to cells where the simulated fires did not reach.

The Wildfire Analyst fire simulator considered the number of times that the simulated fires burned each cell. After that, results were weighted by considering the historical fire occurrence of those fires that burned in high and extreme weather conditions. The weighting was done by assessing the relationship between the annual historical fire ignition density in Colorado and the total number of simulated fires by varying input data in high and moderate weather scenarios and the historical spatial distribution of the ignition points..

The probability map is derived at a 20-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local protection mitigation or prevention planning.





Values at Risk Rating

The Values at Risk Rating (VAR) is an overall rating that combines the risk ratings for Wildland Urban Interface (WUI), Forest Assets, Riparian Assets, and Watershed Protection Areas into a single measure of values-at-risk.

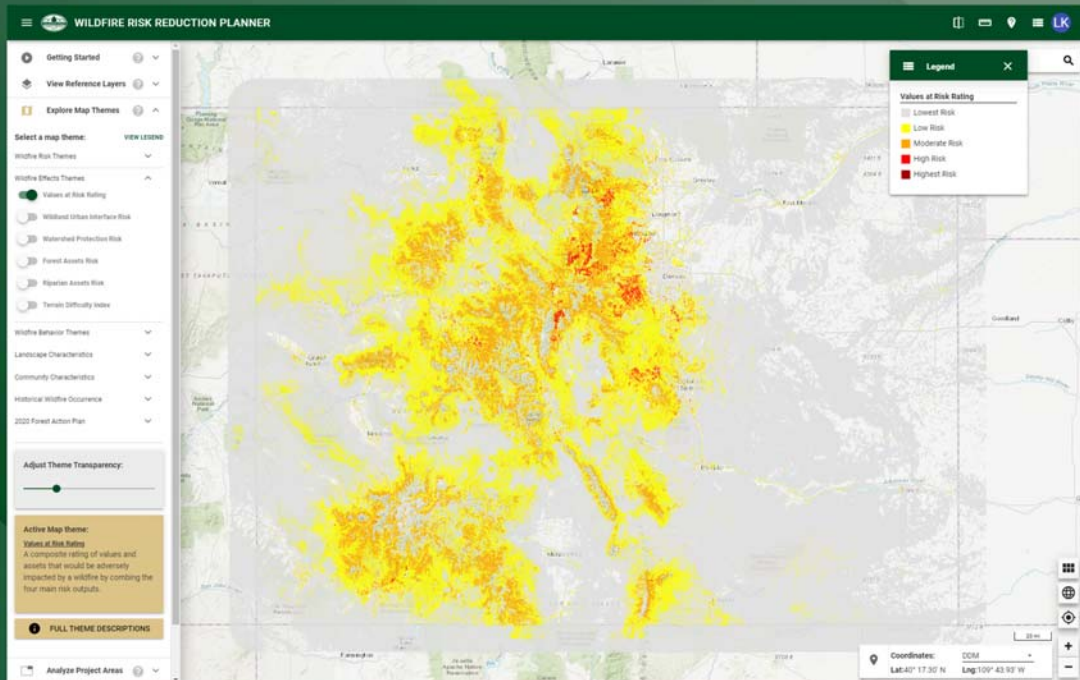
The individual ratings for each value layer were derived using a Response Function approach.

Response functions are a method of assigning a net change in the value to a resource or asset based on susceptibility to fire of different intensity levels. A resource or asset is any of the Fire Effects input layers, such as WUI, or Forest Assets. These net changes can be adverse (negative) or beneficial (positive).

Calculating the VAR at a given location requires spatially defined estimates of the likelihood and intensity of fire integrated with the identified resource value. This interaction is quantified through the use of response functions that estimate expected impacts to resources or assets at the specified fire intensity levels. The measure of fire intensity level used in the Colorado assessment is flame length for a location. Response Function outputs were derived for each input data set and then combined to derive the Values at Risk Rating.

Different weightings are used for each of the input layers with the highest priority placed on protection of people and structures (i.e. WUI). The weightings represent the value associated with those assets. Weightings were developed by a team of experts during the assessment to reflect priorities for fire protection planning in Colorado. Refer to the CO-WRA Final Report for more information about the layer weightings.

Since all areas in Colorado have the VAR calculated consistently, it allows for comparison and ordination of areas across the entire state. The VAR data were derived at a 20-meter resolution.





Wildland Urban Interface Risk

The Wildland-Urban Interface (WUI) Risk Index layer is a rating of the potential impact of a wildfire on people and their homes.

The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the wildland-urban interface and rural areas is essential for defining potential wildfire impacts to people and homes.

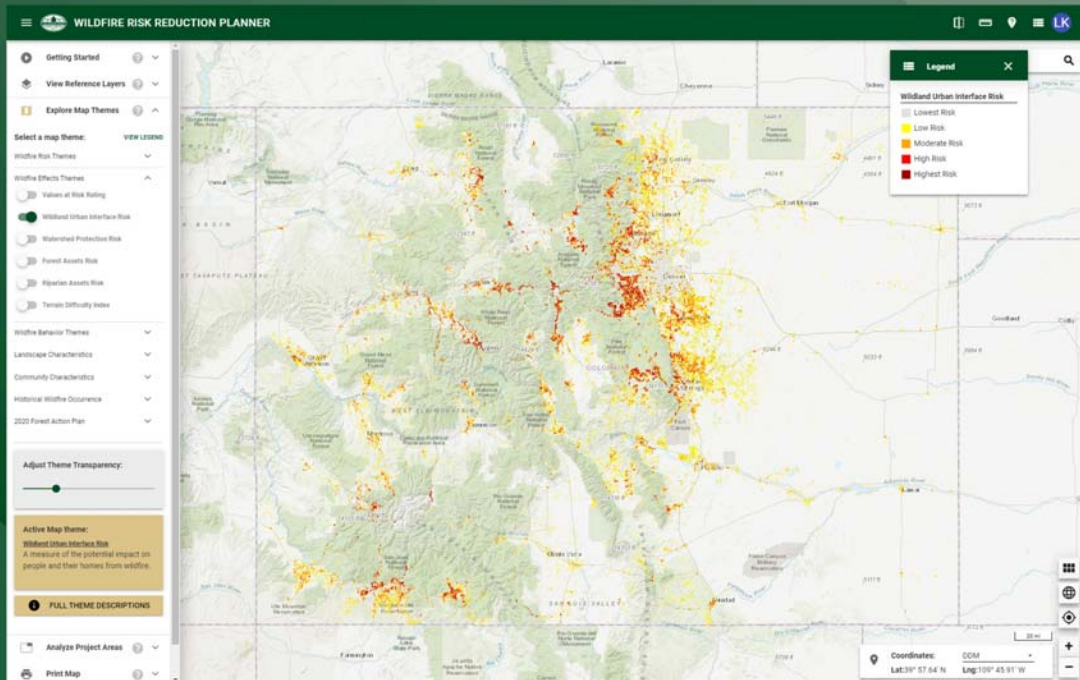
The WUI Risk Index is derived using a response function modeling approach. Response functions are a method of assigning a net change in the value to a resource or asset based on susceptibility to fire at different intensity levels, such as flame length.

To calculate the WUI Risk Index, the WUI housing density data were combined with flame length data and response functions were defined to represent potential impacts. The response functions were defined by a team of experts led by Colorado State Forest Service mitigation planning staff. By combining flame length with the WUI housing density data, it is possible to determine where the greatest potential impact to homes and people is likely to occur.

Customized urban encroachment algorithms were used to ensure those fringe urban areas were included in the WUI Risk outputs. Encroachment distances into urban areas were based on the underlying fuel models and their fuel types and propensity for spotting and spreading.

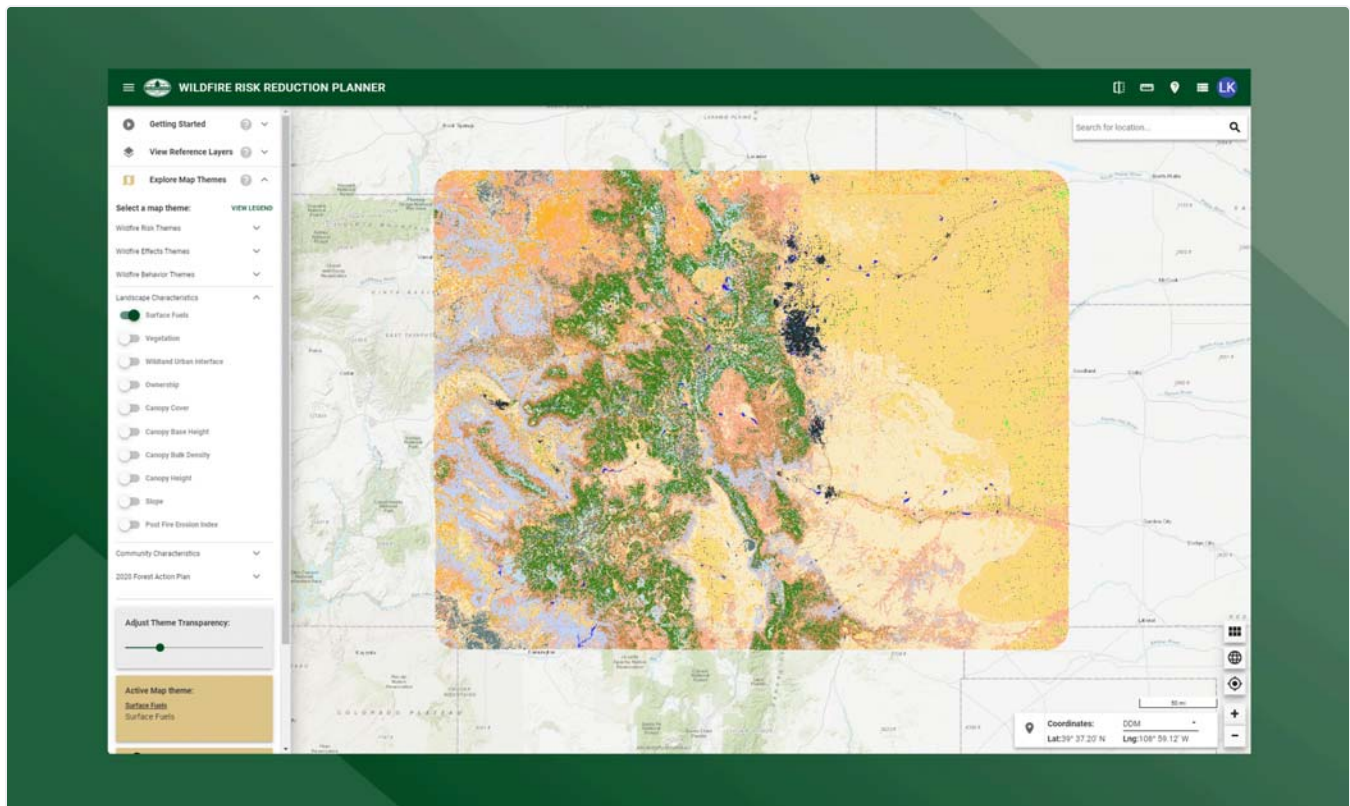
The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact. For example, areas with high housing density and high flame lengths are rated -9, while areas with low housing density and low flame lengths are rated -1. The response function outputs were combined into 5 qualitative classes.

The WUI Risk Index has been calculated consistently for all areas in Colorado, which allows for comparison and ordination of areas across the entire state. Data is modeled at a 20-meter cell resolution, which is consistent with other CO-WRA layers.





Surface Fuels



Fire behavior fuel models that contain the parameters required to calculate fire behavior outputs.

Surface fuels, or fire behavior fuel models as they are technically referred to, contain the parameters needed by the Rothermel (1972) surface fire spread model to compute surface fire behavior characteristics, e.g. rate of spread, flame length, fireline intensity, and other fire behavior metrics. As the name might suggest, surface fuels account only for surface fire potential. Canopy fire potential is computed through a separate but linked process. The CO-WRA accounts for both surface and canopy fire potential in the fire behavior outputs.

An up-to-date surface fuel dataset at 20-meter (m) resolution was developed for this project, based on Scott and Burgan (2005) fuel models, enhanced with custom fuels created by Technosylva. The custom fuels distinguish this assessment from previous ones performed

Colorado as they allow a better characterization of fire behavior across the landscape. Additionally, the urban and road custom fuel models included in the assessment are key for better characterizing the exposure, vulnerability and risk of both buildings and population in the Wildland Urban Interface (WUI). This also allows for better modeling of fire encroachment in urban areas considering the building density, community structure and fuels surrounding the buildings and urban areas.

The following custom fuels were included in order to improve the fire modeling in timber, WUI and agricultural areas:

- Timber: 2 new categories (171 and 191)
- Urban: 7 new categories (911,912,913,914,915,916 and 919)
- Roads: 5 new categories (941,942,943,944 and 949)
- Agriculture: 4 new categories (931,932,938a and 939)
- Water: 3 new categories (981,982 and 989)

Additionally, we also considered canopy fuel data to better simulate crown fire behavior. This includes:

- canopy bulk density (CBD)
- canopy base height (CBH)
- canopy cover (CC)
- canopy height (CH)

The updated fuel dataset also considered the effects of natural disturbances on vegetation (fires, insect and disease, and harvesting/fuel treatments) that occurred in Colorado from 2013 to 2022. More information about the methods used can be found in the Colorado 2022 Fuels Mapping Final Report.

Table 13 provides a description of the 2022 CO-WRA fuels dataset classes.

Table 13. 2022 Colorado 2022 Fuel Model Dataset classes

Legend

 Colorado State + 15 miles buffer	 TL1 (181)-Low Load Compact Conifer Litter
 NB2 (92)-Snow/Ice	 TL2 (182)-Low Load Broadleaf Litter
 NB3 (93)-Agricultural	 TL3 (183)-Moderate Load Conifer Litter
 NB8 (98)-Open Water	 TLML1 (191) - Timber Litter ML (TSYL 2022)
 NB9 (99)-Bare Ground	 SB3 (203)-High Load Activity Fuel or Moderate Load Blowdown
 GR1 (101)-Short, Sparse Dry Climate Grass	 SB4 (204)-High Load Blowdown
 GR2 (102)-Low Load, Dry Climate Grass	 UIL (911)-Isolated urban surrounded by Low FB fuel
 GR3 (103)-Low Load, Very Coarse, Humid Climate Grass	 USL (912)-Scattered urban surrounded by Low FB fuel
 GR4 (104)-Moderate Load, Dry Climate Grass	 UCL (913)-Urban core surrounded by Low FB fuel
 GR1 (111)-Short, Sparse Dry Climate Grass - ALPINE	 UIH (914)-Isolated urban surrounded by High FB fuel
 GR2 (112)-Low Load, Dry Climate Grass - ALPINE	 USH (915)-Scattered urban surrounded by High FB fuel
 GS1 (121)-Low Load, Dry Climate Grass-Shrub	 UCH (916)-Urban core surrounded by High FB fuel
 GS2 (122)-Moderate Load, Dry Climate Grass-Shrub	 UNB (919)-Unburnable urban areas
 GS3 (123)-Moderate Load, Humid Climate Grass-Shrub	 ASL (931)-Agricultural Low Load Fuels, with seasonal changes of its Burnable condition
 GS4 (124)-High Load, Humid Climate Grass-Shrub	 ASH (932)-Agricultural High Load Fuels, with seasonal changes of its Burnable condition
 GS1 (131)-Low Load, Dry Climate Grass-Shrub - ALPINE	 AGC (938)-Golf courses - Non-Burnable (no encroachment)
 SH1 (141)-Low Load Dry Climate Shrub	 ANB (939)-Agricultural Fields, maintained in a Non-Burnable condition
 SH2 (142)-Moderate Load Dry Climate Shrub	 RNL (941)-Minor roads Low FB
 SH4 (144)-Low Load, Humid Climate Timber-Shrub	 RNH (942)-Minor roads High FB
 SH5 (145)-High Load, Dry Climate Shrub	 RML (943)-Major roads Low FB
 SH7 (147)-Very High Load, Dry Climate Shrub	 RMH (944)-Major roads High FB
 SH7 (157)-Very High Load, Dry Climate Shrub	 RNB (949)-Roads surrounded by non-burnable fuels
 TU1 (161)-Low Load Dry Climate Timber-Grass-Shrub	 WNL(981)-Minor Water streams surrounded by Low Load Fuel (moderate encroachment)
 TU2 (162)-Moderate Load, Humid Climate Timber-Shrub	 WNH(982)-Minor Water streams surrounded by High Load Fuel (high encroachment)
 TU3 (163)-Moderate Load, Humid Climate Timber-Grass-Shrub	 WBD(989)-Water Bodies
 TUML1 (171) - Timber Understory Dynamic ML (TSYL 2022)	

References

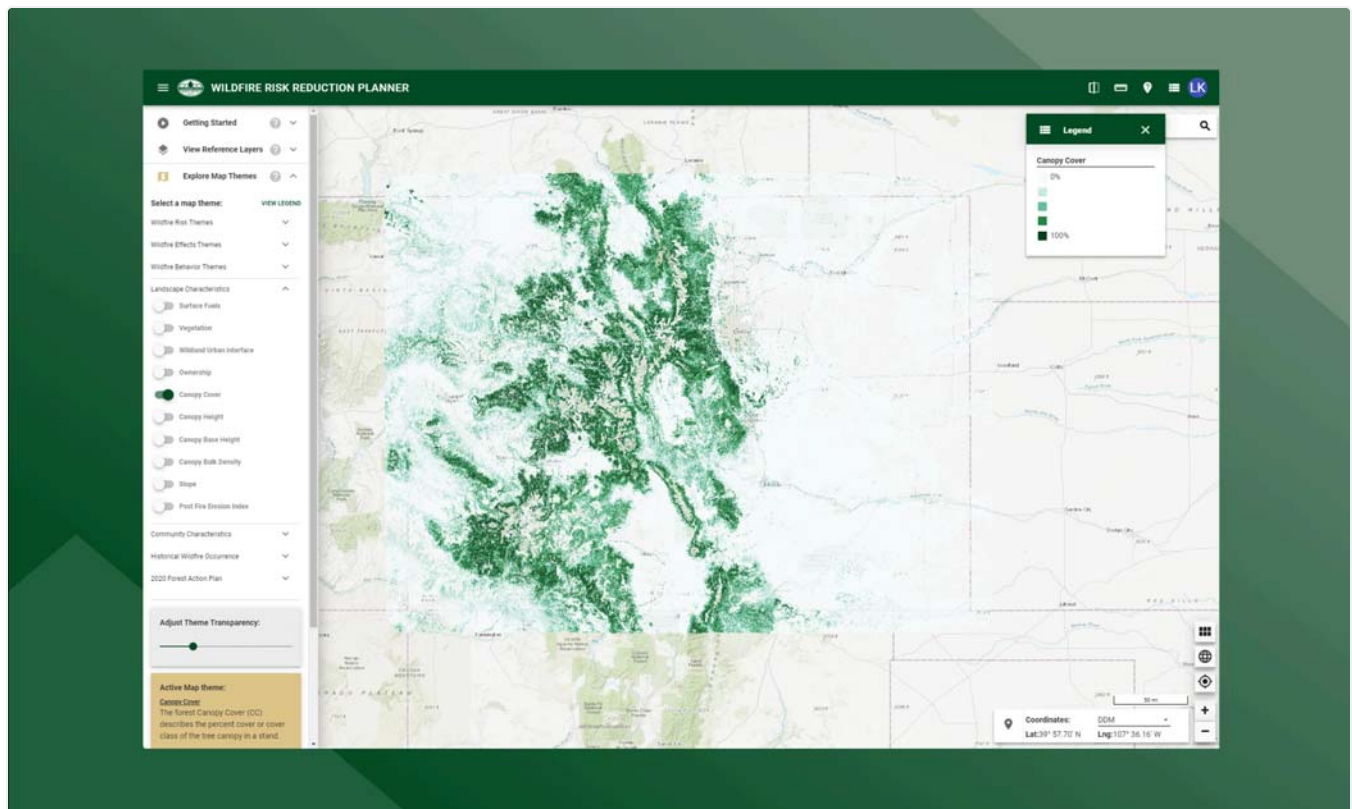
[26] CSFS 2022 Fuels Mapping Final Report. Technosylva, June 2022. Available from the Colorado State Forest Service.

2 NCEP Reanalysis data provided by the NOAA/OAR/ESRL PSD, Boulder, Colorado, USA, from their web site at <https://www.esrl.noaa.gov/psd/>



Canopy Cover

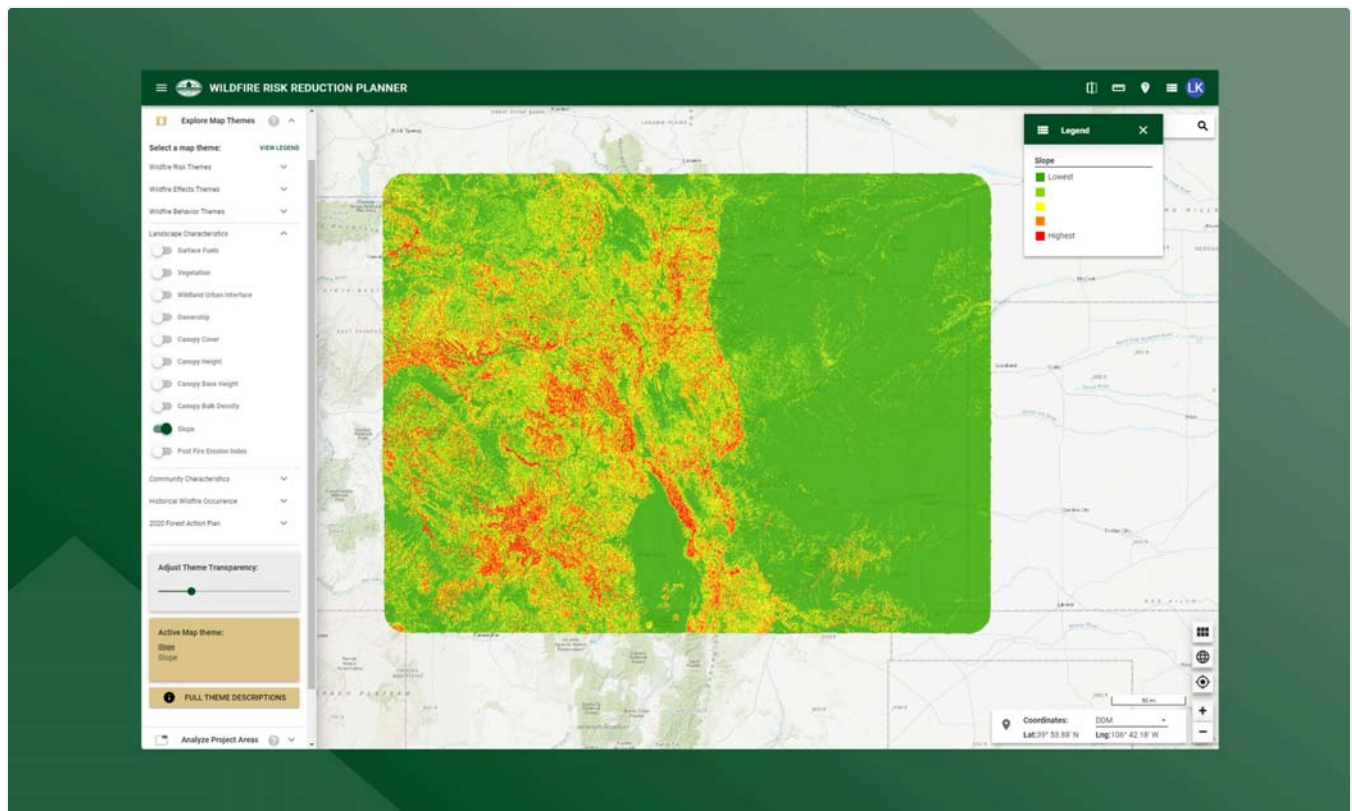
The forest Canopy Cover (CC) describes the percent cover or cover class of the tree canopy in a stand.





Slope

The slope of the line is the ratio of the rise to the run, expressed as a percentage. Slope can be a primary influence on wildland fire behavior.





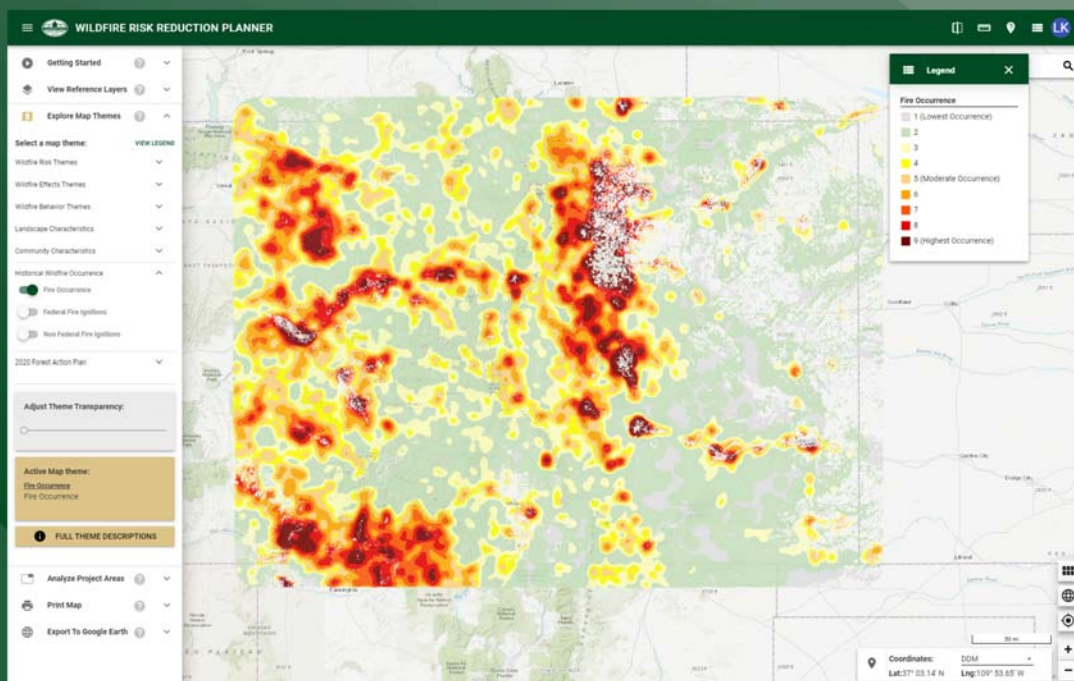
Fire Ignitions (Heat Map)

Fire Ignitions is an ignition density that reflects historical ignition patterns.

Occurrence is derived by modeling historic wildfire ignition locations to create an ignition density map. Historic fire report data were used to create the ignition points for all Colorado fires. This included both federal and non-federal fire ignition locations.

The class breaks are determined by analyzing the Fire Occurrence output values for the entire state and determining cumulative percent of acres (i.e. Class 9 has the top 1.5% of acres with the highest occurrence rate).

The Fire Occurrence map is derived at a 20-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not sufficient for site specific analysis, it is appropriate for regional, county or local protection mitigation or prevention planning.





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APPENDIX C
CSFS Home Ignition Zone Guide



THE HOME IGNITION ZONE



A guide to preparing your home
for wildfire and creating defensible space

Formerly Quick Guide FIRE 2012-1: Protecting Your Home From Wildfire



Reducing Your Home's Wildfire Risk Begins With You

WHY?

Homeowners have the ultimate responsibility to proactively prepare their property for wildfire. By creating and maintaining the home ignition zone, residents can improve the likelihood of their home surviving a wildfire and reduce the negative impacts wildfires can have on their property.

In Colorado, if you live in the wildland-urban interface, it is not a matter of *if* a wildfire will impact your home and property, but *when*.

If your home is located in or near the natural vegetation of Colorado's grasslands, shrublands, foothills or mountains, you live in the wildland-urban interface — also known as the WUI — and are inherently at risk from a wildfire. This includes any areas where structures and other human developments meet or intermingle with wildland vegetative fuels.

Wildfires are a natural part of Colorado's varied ecosystems. Planning ahead and taking actions to reduce the risk of wildfires can increase the likelihood your home survives when wildfires occur.

As more people choose to live in

wildfire-prone areas, additional homes and lives are potentially threatened every year. Firefighters always do their best to protect residents, but **ultimately, it is your responsibility to protect your property and investments from wildfire.**

This guide focuses on actions that are effective in reducing wildfire hazards on your property. It is important to recognize that these efforts should always begin with the home or structure itself and progress outwards.

Also, remember that taking wildfire risk reduction steps is not a one-time effort — it requires ongoing maintenance. It may be necessary to perform some actions, such as removing pine needles from gutters and mowing grasses and weeds, several times a year. Other actions may just need to be

addressed annually or only once.

While you may not be able to accomplish all of these actions at once to prepare your home and property for wildfire, each completed activity will improve the safety of your home during a wildfire. However, it is important to remember there are no guarantees when it comes to wildfire. Implementing risk reduction actions does not guarantee your home will survive a wildfire, but it does improve the odds.

Knowing that wildfire impacts are inevitable, it is not only important for individuals to work on their own homes, but also for residents to work together to increase their community's resilience to wildfire. To become fire adapted, actions must not only be taken before a wildfire



As the 416 Fire burned near Durango in 2018, firefighters conducted burnouts near homes in the fire's path to eliminate fuel for the main fire and provide a secure control line. The work done by homeowners to create the defensible space buffer visible here gave firefighters the option to safely conduct the operation. Photo: Jerry McBride, Durango Herald

arrives but during and after a fire.

The National Cohesive Wildland Fire Management Strategy defines a fire-adapted community as “a human community consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire.”

In order to increase the likelihood homes and infrastructure survive a wildfire, all landowners must work together to reduce fire hazards within and adjacent to communities. This includes work on individual home sites and common areas within communities. Every community member has a role in fire adaptation, from civic leaders, to developers, to first responders, to homeowners and land management agencies.

WHAT'S YOUR



WUI RISK?

MORE THAN

HALF

of Colorado residents live in the wildland-urban interface and are at some risk of being affected by wildfire.

Source: CSFS WUI Risk Assessment 2017

Access WUI risk information coloradoforestatlas.org

Reduce your wildfire risk csfs.colostate.edu

Protect your community fireadaptednetwork.org

What Is the Home Ignition Zone?

HOME IGNITION ZONE (HIZ)

is the home and the area around the home (or structure). The HIZ takes into account both the potential of the structure to ignite and the quality of defensible space surrounding it.

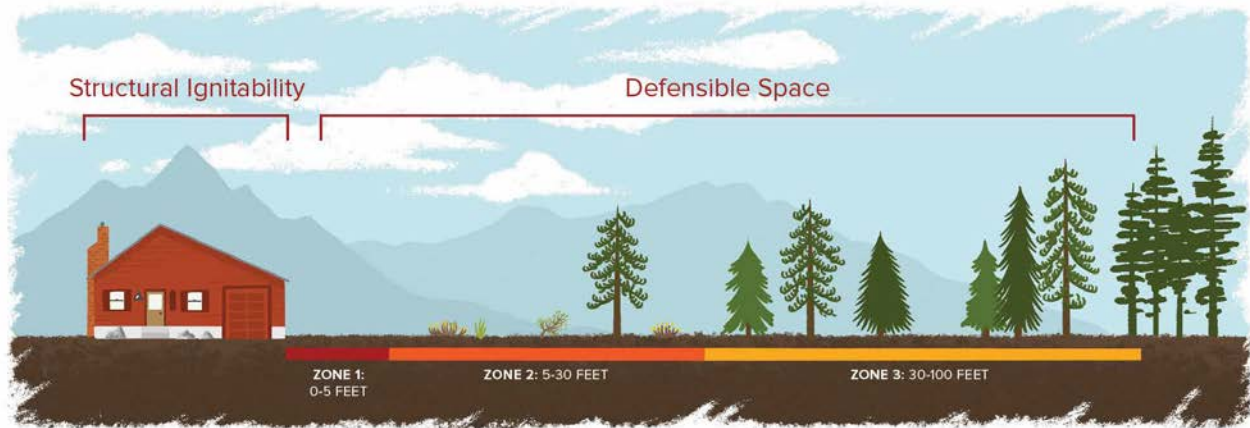


Illustration: Bonnie Palmatory, Colorado State University

The two primary determinants of a home's ability to survive a wildfire include the structure's ignitability and the quality of the surrounding defensible space. Together, these two factors create a concept called the home ignition zone, or

HIZ. It includes the structure and the space immediately surrounding it.

The space around the home is divided into three distinct spaces of management, zones 1, 2 and 3. Pages 8-9 outline specific goals and critical steps to manage your

property within each of these zones.

To reduce wildfire hazards to your home and property, the most effective proactive steps to take are to minimize the ability of the home to ignite and to reduce or eliminate nearby fuel.

METHODS OF HOME IGNITION

1. EMBER IGNITION

Embers (firebrands) are small pieces of burning material that can be transported by wind more than a mile ahead of a wildfire's flaming front. Embers can vary greatly in size, but even the smallest can start new fires (known as spot fires) on any ignitable surface they encounter, inside or outside a home. This is the most common source of home ignition during wildfires.

Flammable horizontal or nearly horizontal surfaces, such as wooden decks or shake-shingle roofs, are at greater risk for ignition from burning embers.

Many homes in the wildland-urban interface have burned because of airborne embers, so addressing structural ignitability is critical even if it appears difficult for fire to spread in the area surrounding a home.

2. SURFACE FIRE/ DIRECT FLAME CONTACT

If fuels are adjacent to a home, direct flame contact can ignite the house. Ensuring no such fuels exist within 5 feet of a home, particularly near windows or under decks, greatly minimizes this possibility.

3. RADIANT HEAT

Radiant heat is what you feel on your hands while warming them next to a campfire. This same type of heat transfer can ignite a home, whether the source of the heat is a crown fire in treetops or an adjacent home that has caught fire.



Flying embers are the most common source of home ignition during wildfires. Preparing homes for their impact is critical. Embers can ignite leaf litter in gutters and on roofs, as well as shrubs and mulch at the base of the house, as seen in this controlled ember shower experiment. Photo: Insurance Institute for Business & Home Safety

What Is Defensible Space?

DEFENSIBLE SPACE

is the area around a home (or structure) that has been modified to reduce fire hazard by creating space between potential fuel sources.

Firefighters may not be present at your home during a wildfire — they are trained to protect structures only when the situation is safe for them. You should prepare your home and property to withstand wildfire without firefighter intervention. Having an effective defensible space combined with reducing structural ignitability is the best way to improve your home's chance of survival.

Defensible space is the area around a home or other structure that has been modified to reduce fire hazard by creating a disconnected fuel load both vertically and horizontally. In this area, natural and manmade fuels are treated, removed or reduced to slow the spread of wildfire and alter fire behavior.

Establishing defensible space reduces the likelihood of a home igniting by direct flame contact or by radiant heat exposure. It also helps limit local production of embers and reduces the chance a structure fire will spread to neighboring homes or surrounding vegetation.

CREATING AN EFFECTIVE DEFENSIBLE SPACE involves establishing a series of management zones. Develop these zones around each building on your property, including detached garages, storage buildings, barns and other structures.



BEFORE



AFTER

A Colorado State Forest Service forest management project near Evergreen cleared dense trees in a residential area to reduce wildfire risk. The same tree with a crooked trunk in the center of these photos shows how tree thinning can be a useful tool to protect property, decrease fire intensity and boost forest health. Photo: Emma Brokl, CSFS

Recognize that fuel continuity and density play a critical role in wildfire behavior.

As you plan defensible space for your property, you can contact your nearest Colorado State Forest Service field office for guidance, or consult a forester, fire department staff or community organization appropriately trained in wildfire mitigation practices.

3

Factors Determine Wildfire Behavior

1. FUELS
2. WEATHER
3. TOPOGRAPHY

Of the three things wildfires need to start and spread, humans cannot change weather or topography, so we must concentrate on altering fuels in order to have any control over a disturbance as dynamic as wildfire.

Fuels can include vegetation like trees, brush and grass; but when near homes, fuels also include propane tanks, woodpiles, sheds and even homes themselves.



East Troublesome Fire. Photo: Zach Wehr, CSFS



Top left: Hardening your home can include choosing noncombustible building materials like stucco paired with a stone facade. This house near Salida shows you don't have to sacrifice curb appeal to reduce the ignitability of your house. Photo: CSFS

Top right: Preparing your home for wildfire can be accomplished as weekend projects, such as clearing vegetation from around your home's perimeter and adding noncombustible material near the foundation that won't ignite if embers land there. Photo: Wildfire Partners

Bottom: A metal roof and noncombustible exterior window coverings add layers of protection against wildfire, in addition to the well-maintained defensible space that surrounds this home. Photo: Wildfire Partners



MORE ONLINE

This guide provides only basic information about structural ignitability.

The National Fire Protection Association (NFPA) and the Insurance Institute for Business & Home Safety (IBHS) together produce Wildfire Research Fact Sheets that provide additional valuable information.

Visit the "Protect Your Home" section at the CSFS website, csfs.colostate.edu/wildfire-mitigation, for links to these and other structural ignitability resources.



Harden Your Home Against the Threat of Wildfire

STRUCTURAL IGNITABILITY

is the likelihood the materials in and on your home will ignite during a wildfire.

The practice of reducing structural ignitability is commonly called “home hardening.”

The ideal time to address home ignition risk is when the structure is in the design phase.

For existing homes, steps must be taken to reduce the structural ignitability in order to improve the likelihood of the home surviving a wildfire. The practice of reducing structural ignitability is commonly called home hardening.

BEST PRACTICES TO REDUCE STRUCTURAL IGNITABILITY

- ☐ Ensure the roof has a Class A fire rating
- ☐ Remove all leaves, needles and other debris from all decks, roofs and gutters
- ☐ Screen attic, roof, eaves and foundation vents with 1/8-inch metal mesh
- ☐ Screen or wall-in stilt foundations and decks with 1/8-inch metal mesh
- ☐ Use tempered glass for windows; two or more panes are recommended
- ☐ Create 6 inches of vertical clearance between the ground and home siding
- ☐ Replace combustible fencing or gates, at least within 5 feet of the home

STRUCTURAL COMPONENTS TO CONSIDER

WINDOWS

Windows can fail either from glass breaking or frames melting before a building ignites, providing a direct path for airborne embers to reach the building's interior. Metal screens should be installed. Windows with multiple panes provide greater protection than single-paned windows.

VENTS

Vents that are not screened or are screened with a gap that exceeds 1/8 of an inch can be a direct entry point for embers to infiltrate a home and ignite it from the inside. Metal mesh screen that is 1/8-inch is small enough that most embers will be extinguished before making it inside.

SOURCE NFPA/IBHS Wildfire Research Fact Sheet — Attic and Crawl Space Vents

EXTERIOR WALLS

The exterior walls of a home or other structure are affected most by radiant heat from a fire and, if defensible space is not adequate, by direct contact with flames. Fiber cement board, brick, stucco or other fire resistant materials are recommended.

ROOF

The roof has a significant impact on a structure's ignitability because of its extensive surface area. When your roof needs significant repairs or replacement, choose only fire-resistant roofing materials. Wood and shake-shingle roofs are strongly discouraged because they are highly flammable and are prohibited in some areas of the state. Metal sheets, concrete or shingles made from asphalt, tile, clay, stone or metal are all recommended roofing materials. It is critical to keep the roof and gutters clear of flammable debris.

SOURCE NFPA/IBHS Wildfire Research Fact Sheet — Roofing Materials

ROOF EXTENSION

The extension of the roof beyond the exterior structure wall is called the eave. This architectural feature is particularly prone to ignition. As fire approaches a building, the exterior wall deflects hot air and gases up into the eave. If the exterior wall isn't ignition-resistant, the effect of the excess heat is amplified.

SOURCE NFPA/IBHS Wildfire Research Fact Sheet — Under-Eave Construction

DECKS/FENCES

Some decks and fences are readily combustible, whether made of synthetic (plastic/composite) or natural materials (wood). Many deck designs allow embers to accumulate between board gaps and at joists below deck boards. Embers can also fall through decks and may easily ignite flammable materials beneath, making it critical to remove all materials from underneath the deck. Regardless of how fuels below decks may ignite, these burning materials can readily ignite the deck and threaten the home.

Fencing material that attaches to the home must be considered a direct extension of the structure and should be made of a noncombustible material, at least where it is immediately adjacent to a home.

SOURCE NFPA/IBHS Wildfire Research Fact Sheets — Fencing | Decks

TO MANAGE YOUR HOME, LEARN THE THREE ZONES

ZONE 1

0-5 FEET FROM THE HOME

The area nearest the home. This zone requires the most vigilant work in order to reduce or eliminate ember ignition and direct flame contact with your home.

ZONE 2

5-30 FEET FROM THE HOME

The area transitioning away from the home where fuels should be reduced. This zone is designed to minimize a fire's intensity and its ability to spread while significantly reducing the likelihood a structure ignites because of radiant heat.

ZONE 3

30-100 FEET FROM THE HOME

The area farthest from the home. It extends 100 feet from the home on relatively flat ground. Efforts in this zone are focused on ways to keep fire on the ground and to get fire that may be active in tree crowns (crown fire) to move to the ground (surface fire), where it will be less intense.

ZONE 1

GOAL: This zone is designed to prevent flames from coming in direct contact with the structure. Use nonflammable, hard surface materials in this zone, such as rock, gravel, sand, cement, bare earth or stone/concrete pavers.

CRITICAL STEPS

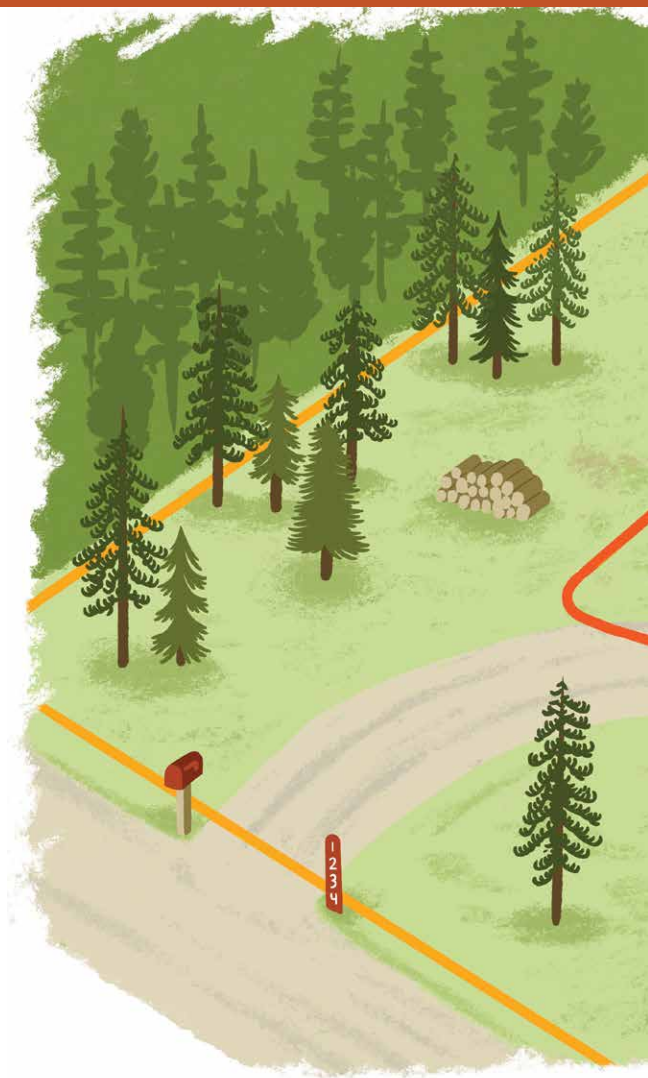
- ☐ Remove all flammable vegetation, including shrubs, slash, mulch and other woody debris.
- ☐ Do not store firewood or other combustible materials inside this zone.
- ☐ Prune tree branches hanging over the roof and remove all fuels within 10 feet of the chimney.
- ☐ Regularly remove all pine needles and other debris from the roof, deck and gutters.
- ☐ Rake and dispose of pine needles, dead leaves, mulch and other organic debris within 5 feet of all decks and structures. Farther than 5 feet from structures, raking material will not significantly reduce the likelihood of ignition and can negatively affect other trees.
- ☐ Do not use space under decks for storage.

ZONE 2

GOAL: This zone is designed to give an approaching fire less fuel, which will help reduce its intensity as it gets nearer to your home or any structures.

CRITICAL STEPS

- ☐ Mow grasses to 4 inches tall or less.
- ☐ Avoid large accumulations of surface fuels such as logs, branches, slash and mulch.
- ☐ Remove enough trees to create at least 10 feet* of space between crowns. Measure from the outermost branch of one tree to the nearest branch on the next tree.
- ☐ Small groups of two or three trees may be left in some areas of Zone 2. Spacing of 30 feet* should be maintained between remaining tree groups to ensure fire doesn't jump from one group to another.
- ☐ Remove ladder fuels under remaining trees. This is any vegetation that can bring fire from the ground up into taller fuels.
- ☐ Prune tree branches to a height of 6-10 feet from the ground or a third of the total height of the tree, whichever is less.
- ☐ Remove stressed, diseased, dead or dying trees and shrubs.



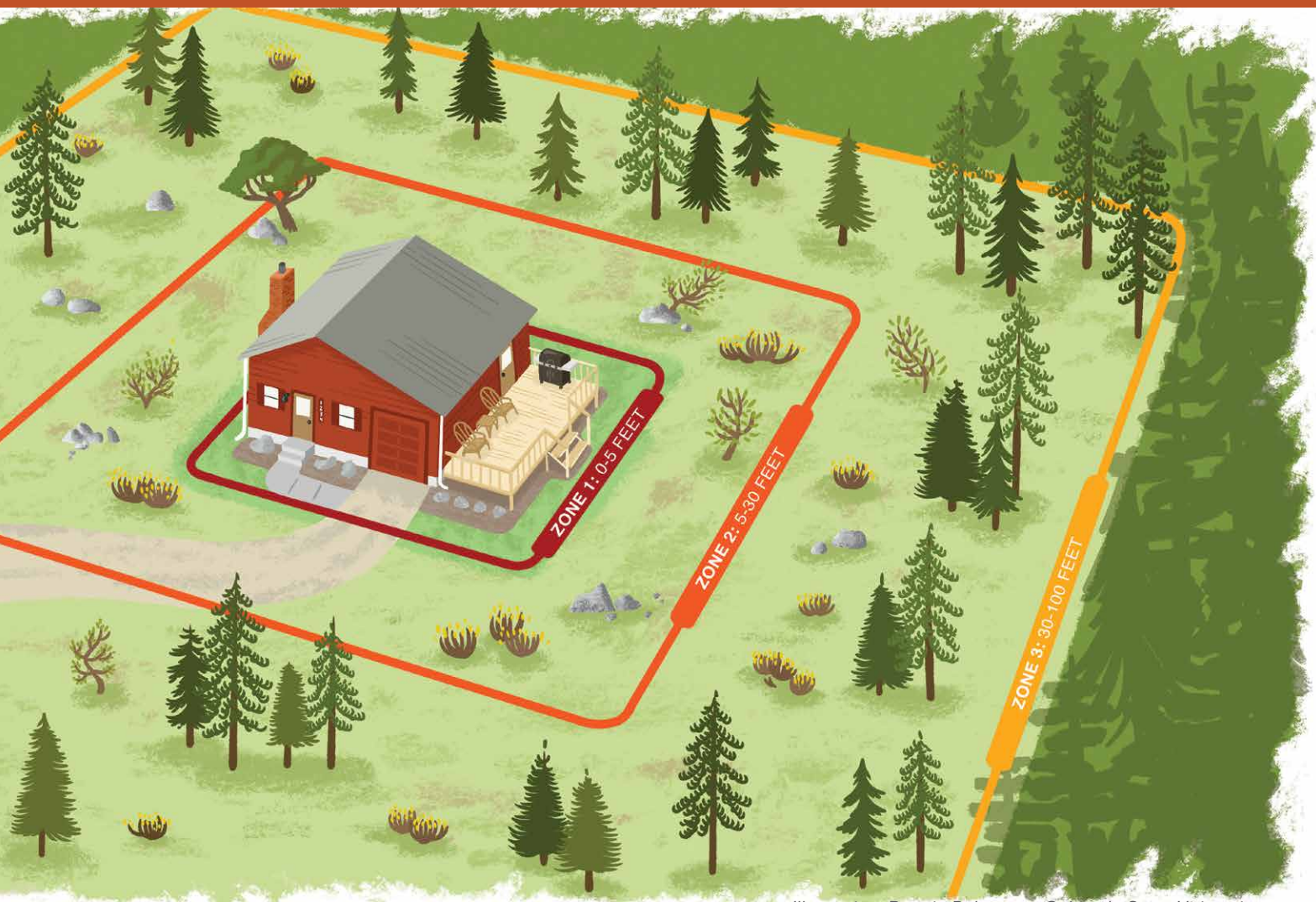


Illustration: Bonnie Palmatory, Colorado State University

This reduces the amount of vegetation available to burn and improves forest health.

- ❑ Common ground junipers should be removed whenever possible because they are highly flammable and tend to hold a layer of flammable material beneath them.
- ❑ You can keep isolated shrubs in Zone 2, as long as they are not growing under trees. Keep shrubs at least 10 feet* away from the edge of tree branches.
- ❑ Periodically prune and maintain shrubs to prevent excessive growth. Remove dead stems annually.
- ❑ Spacing between clumps of shrubs should be at least 2 ½ times* their mature height. Each clump should have a diameter no more than twice the mature height of the vegetation. Example: For shrubs that grow 6 feet tall, space clumps 15 feet apart or more (measured from the edge of the crowns of vegetation clumps). Each clump of these shrubs should not exceed 12 feet in diameter.

** Horizontal spacing recommendations are minimums and can be increased to reduce potential fire behavior, particularly on slopes. Consult a forestry, fire or natural resource professional for guidance with spacing on slopes.*

ZONE 3

GOAL: This zone focuses on mitigation that keeps fire on the ground, but it's also a space to make choices that can improve forest health. Healthy forests include trees of multiple ages, sizes and species, where adequate growing room is maintained over time.

If the distance of 100 feet to the edge of Zone 3 stretches beyond your property lines, it's encouraged to work with adjoining property owners to complete an appropriate defensible space. If your house is on steep slopes or has certain topographic considerations, this zone may be larger.

STEPS TO CONSIDER

- ❑ Mowing grasses is not necessary in Zone 3.
- ❑ Watch for hazards associated with ladder fuels. The chance of a surface fire climbing into the trees is reduced in a forest where surface fuels are widely separated and low tree branches are removed.
- ❑ Tree crown spacing of 6-10 feet is suggested. Consider creating openings or meadows between small clumps of trees so fire must transition to the ground to keep moving.
- ❑ Any approved method of slash treatment is acceptable in this zone, including removal, piling and burning, lop and scatter, or mulching. Lop-and-scatter or mulching treatments should be minimized in favor of treatments that reduce the amount of woody material in the zone. The farther this material is from the home, the better.

Make Home Ignition Zone Maintenance a Priority

WHY?

The home ignition zone requires regular, ongoing maintenance to be effective. Your home is located in a dynamic environment — trees, grasses and shrubs continue to grow, die and drop leaves each season, and there are ongoing maintenance needs on any structures on your property.

HOME IGNITION ZONE CHECKLIST

PREPARE YOUR HOME FOR WILDFIRE WITH THESE STEPS

TOP PRIORITIES

- ☐ **CLEAR** roof, deck and gutters of pine needles and other debris.*
- ☐ **MOW** grass and weeds to a height of 4 inches or less.*
- ☐ **RAKE AND REMOVE** all pine needles and other flammable debris from 5 feet around the foundation of your home and deck.*
- ☐ **TREAT** or mow shrubs that re-sprout aggressively (such as Gambel oak) every 3-5 years or more depending on growth rates.
- ☐ **REMOVE** branches that hang over the roof and chimney.
- ☐ **DISPOSE** of slash from thinning trees and shrubs by chipping, hauling to a disposal site or piling in open areas for burning later. *Any accumulation of slash that's chipped or otherwise should be 30 feet or more from the home.**
- ☐ **AVOID** creating continuous areas of wood chips on the ground when chipping logs and/or slash. Break up the layer of wood chips by adding nonflammable material, or allow for wide gaps of at least 3 feet between chip accumulations.

* Address as needed, more than once a year.

FIREWOOD

- ☐ Keep firewood stacked uphill from (or at the same elevation as) any structures, and keep the woodpile at least 30 feet away from the home.
- ☐ Do not stack firewood between remaining trees, underneath the deck or on the deck.
- ☐ Remove flammable vegetation within 10 feet of woodpiles.

PROPANE TANKS

- ☐ Keep aboveground tanks at least 30 feet from the home, preferably on the same elevation as the house.
- ☐ Remove flammable vegetation within 10 feet of all propane tanks and gas meters.

DRIVEWAYS

- ☐ Maintain at least 10 feet between tree crowns, thinning them a minimum of 30 feet back from each side of the driveway from the house to the main access road.
- ☐ Remove ladder fuels beneath trees after thinning.
- ☐ Remove any shrubs that are within 10 feet of the outer edge of tree crowns.
- ☐ Space shrubs apart at least 2 ½ times their mature height, as measured from the edge of the shrubs.
- ☐ Post signs at the end of the driveway with your house number that are noncombustible, reflective and easily visible to emergency responders.

SOLUTIONS FOR MANAGING SLASH

1

Spread slash and wood chips over a large area to avoid heavy accumulations and large piles. Being close to the ground will help speed decomposition.

2

Burn slash piles, but before doing so, always contact your county sheriff's office or local fire department for current information or possible restrictions.

3

Lop and scatter slash by cutting it into small pieces (less than 24 inches long) and spreading it over a wide area, to a depth not exceeding 18 inches. Don't scatter material over 4 inches in diameter.



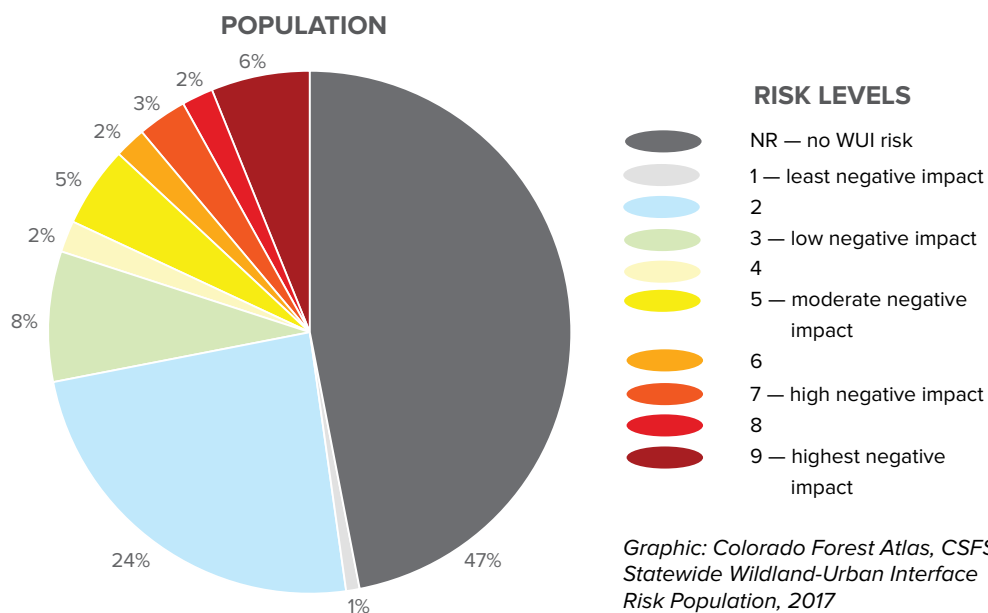
The Colorado State Forest Service works with communities to reduce wildfire risk and become recognized Firewise USA® sites, an accomplishment Piñon Ridge Estates in Chaffee County earned in 2021. CSFS forester Josh Kuehn, right, presents Craig Sommers of Piñon Ridge, with a sign for the community after residents completed the steps required for program recognition. In 2019, the Decker Fire came within a mile and a half of the neighborhood. Photo: Chaffee Chips

More Than Half of Colorado Residents Live With Some Wildfire Risk

The wildland-urban interface (WUI) includes the portions of Colorado where human development meets wildland vegetation.

The majority of Coloradans live in the WUI, in places with at least some risk of wildfire. And that number continues to increase as more residents build homes in the WUI.

As of 2017, the WUI covered about 3.2 million acres in Colorado. By 2040, the WUI area could encompass over 9 million acres in the state, according to projections from Colorado government models.



Additional Wildfire Mitigation Resources Online

- » Colorado State Forest Service wildfire mitigation information and publications
csfs.colostate.edu/wildfire-mitigation
- » Community Wildfire Protection Planning
csfs.colostate.edu/wildfire-mitigation/community-wildfire-protection-plans
- » Insurance Institute for Business & Home Safety
ibhs.org/risk-research/wildfire
- » Colorado Wildfire Risk Viewer and Risk Reduction Planner
coloradoforestatlas.org
- » National Fire Protection Association: Firewise USA®
nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA
- » Fire Adapted Communities Learning Network
fireadaptednetwork.org

Fuel Types and Arrangements

FUEL

is any material that will burn.

Whether in a wildland or urban location, when fuels are abundant and there's no space between them, a fire can quickly become uncontrollable and destructive. But when fuels are scarce and separated, a fire cannot build momentum and intensity, which makes it more manageable.

The closer together the fuels are near

your home, the bigger the threat they pose.

Fuel hazard measures look at both horizontal and vertical fuels, factoring in the type, amount and arrangement of fuels (called continuity and uniformity). Horizontal continuity is how the fuels are arranged laterally across the ground or among plant canopies. Vertical continuity refers to fuels extending from the ground into the crowns

of trees and shrubs.

Fuels with a high degree of both vertical and horizontal continuity are the most hazardous, particularly when they occur on slopes.

Mitigating wildfire hazards in the home ignition zone disrupts this fuel continuity, which helps reduce a fire's intensity and potential sources of home ignition.

SURFACE FUELS



Colorado State Forest Service

GRASSES

Grasses are perhaps the most pervasive and abundant surface fuel in Colorado. When available to burn, grasses can catch fire easily, and grass fires often spread rapidly. They also burn out quickly and do not release as much energy as fires in larger fuel types, like trees. Nonetheless, grass fuels can readily ignite structures that are directly adjacent to them.



Colorado State Forest Service

NEEDLES/LEAVES

Needles and leaf litter accumulate naturally in forests across the state. Long needles from pines like ponderosa and broadleaf litter from trees like aspen, cottonwood and maple do not compact as readily as other leaf types. Fire in these fuels can spread rapidly, particularly during windy conditions.

Shorter needle litter from spruce, fir and lodgepole pines compacts more readily and does not generally spread as fast.

Needles and leaves that ignite anywhere on or adjacent to a structure can cause damage and loss.



Colorado State Forest Service

LOGS/BRANCHES/SLASH/ WOOD CHIPS (MULCH)

Naturally occurring woody material on the ground and debris left from cutting down trees and shrubs (slash) are an important part of the fuel complex near structures.

This larger and denser material generates more heat than smaller fuels do, and it can be problematic when it is burning near structures.

Ultimately, the farther away from a structure that large amounts of these materials can be moved, the better.

MORE: A guide to mulched materials is available on the Colorado Forest Restoration Institute website, cfri.colostate.edu.



A firefighter monitors a burnout on the 416 Fire in southwest Colorado in 2018. This effort to manage the wildfire by eliminating fuels left of the train tracks illustrates how fire can transition through different fuel types and arrangements. Photo: Kyle Miller, Wyoming Interagency Hotshot Crew

VERTICAL/LADDER FUELS



Kari Greer

LADDER FUELS

Ladder fuels are burnable materials such as smaller trees and brush that provide a means for fire to climb vertically and continue into aerial fuel sources. Ladder fuels allow a fire to leave the ground level and burn up into the branches and crowns of larger vegetation. Lower branches on large trees also can act as ladder fuels.

These fuels are potentially very hazardous but are generally easy to mitigate. Pay close attention to ladder fuels near homes, as they are extremely hazardous and especially important to address.



InciWeb

BRUSH/SHRUBS

Examples of common brush fuels in Colorado are sagebrush, bitterbrush and mountain mahogany.

As with any type of fuel, brush that is close together and adjacent to homes is hazardous.

In dry climates like Colorado, brush fuels are generally dense and contain more material in a given space than grasses. Brush also usually grows larger and burns longer and more intensely than grass when it ignites.

This makes brush fires more complex, particularly when the brush grows under trees or in large, uniform stands.

CROWN (AERIAL) FUELS



Kari Greer

CROWN FUELS

An intense fire burning in surface fuels can transition into the upper portion of the tree canopies and become a crown fire. Crown fires are dangerous because they are intense, often move rapidly, can burn large areas, and produce embers that can travel great distances and start spot fires well ahead of the main fire.

Crown fire hazard can be reduced by thinning trees to decrease crown fuels, reducing surface fuels under the remaining trees and eliminating vertical fuel continuity from the ground into the crowns.

See recommendations on pages 8-9 of this guide.

Forest Types

Recommendations in this guide refer primarily to ponderosa pine, Douglas fir and mixed-conifer ecosystems below 9,500 feet in elevation.

Those who live in or near other forest types can follow these additional recommendations.



PIÑON-JUNIPER

Fires in piñon-juniper forests tend to burn intensely in the crowns of trees under windy conditions.

When thinning these trees on a property, create a mosaic pattern that is a mixture of individuals and clumps of three to five trees. The size of each clump will depend on the size, health and location of the trees. The minimum spacing between the crowns of individual trees is 10 feet, increasing for larger trees, clumps and stands on steeper slopes.

Pruning trees for defensible space is not as critical in piñon-juniper forests as it is in pine or fir forests. Instead, it is more important to space the trees so it is difficult for a fire to move from one tree clump to the next. These trees should only be pruned to remove branches that are dead or are touching the ground. Live branches can be pruned up to 3 feet above the ground, or a third the height of the tree, whichever is less. Removing shrubs growing beneath piñon and juniper canopies is recommended.

Pruning live branches or removing and processing these trees is not recommended between April and October, when the piñon Ips beetle is active in Colorado. Thinning activity that stimulates sap flow in summer months can attract these beetles to healthy trees. It is acceptable to remove dead trees and dead branches during the summer.



LODGEPOLE PINE

Older lodgepole pine stands generally do not respond well to selective thinning, but instead respond better to removing all trees over a defined area to allow healthy forest regeneration.

Selectively thinning lodgepole can open the stand to severe windthrow and stem breakage. However, if your home is located within a lodgepole pine forest, you may prefer selective thinning instead of removing all the standing trees.

Thinning older stands of lodgepole pine to the extent recommended for defensible space may require several attempts spaced over a decade or more. No more than 30 percent of the trees in a mature stand should be removed in each thinning operation. Focus on removing trees that are obviously lower in height or suppressed in the forest canopy. Leaving the tallest trees will make the remaining trees less susceptible to windthrow.

Another option is leaving clumps of 30-50 trees. Clumps are less susceptible to windthrow than solitary trees. Allow a minimum of 30-50 feet between tree crowns on the clump's perimeter and any adjacent trees or clumps of trees.

To ensure a positive response to thinning throughout the life of a lodgepole pine stand, trees must be thinned early. Begin when trees are small saplings and maintain low densities within the stand as the trees mature.



GAMBEL OAK

Maintaining Gambel oak forests that remain resistant to the spread of wildfire can be a challenge because of their vigorous growing habits. Gambel oak trees grow in clumps or groves, and the stems in each clump originate from the same root system. Most reproduction occurs through sprouts from this deep, extensive root system.

Treat Gambel oak near your home every three to five years, or more often depending on growing conditions. Sprouts should be mowed at least once a year. Herbicides can be used to supplement mowing and control regrowth when treating whole clumps.

This species can be “trained” to grow more like a tree than a shrub in some locations. Remove small diameter oak within clumps and any sprouts growing parallel to the ground.



SPRUCE-FIR

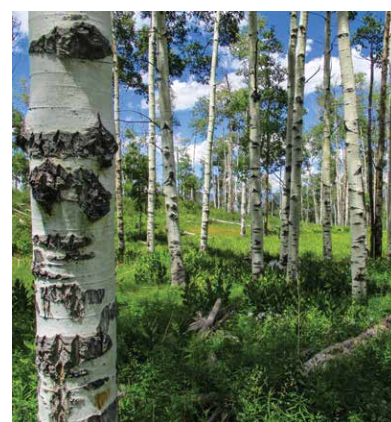
Spruce and fir trees tend to grow in association with each other.

Mature spruce and fir are prone to windthrow when heavily thinned. Light thinnings or leaving groups of trees will help mitigate this problem.

Their hardiness against the wind may not be a problem if a tree has grown to maturity in the open and isn't surrounded by other trees.

Spruce and fir tend to have crowns that extend to the ground. Eliminating lower branches that act as ladder fuels is recommended.

The spruce and Ips bark beetles are native to Colorado and infest Engelmann spruce and Colorado blue spruce. They are particularly attracted to recently fallen green trees and limbs, so it is important to remove any cut branches in a timely manner so surrounding healthy trees are not infested.



Photos: Colorado State Forest Service

ASPEN

Tree spacing and ladder fuel guidelines do not apply to mature stands of aspen trees.

Generally, no thinning is recommended in aspen forests, regardless of tree size, because the thin bark is easily damaged, which can make the tree highly susceptible to fungal infections.

However, in older stands, numerous dead trees on the ground do require removal. Conifer trees often start growing in older aspen stands and can grow up through these old, downed aspens. A buildup of these trees eventually will increase the fire hazard of the stand, so young conifers should be removed from these areas.

Brush also can increase fire hazard in aspen stands and should be thinned to reduce flammability.

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- Jamie Gomez, West Region Wildfire Council
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- Daniel Bowker, Coalition for the Poudre River Watershed
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- Brett Wolk, Colorado Forest Restoration Institute
- Camille Stevens-Rumann and Courtney Peterson, Colorado State University
- CSFS program division staff and associate directors
- CSFS field office personnel

Cover Photography

FRONT

Top left: Cleaning debris from gutters is a critical step to prevent home ignition. Photo: Wildfire Partners. **Top right:** Firefighters from Colorado's Platte Canyon Fire Protection District defend a home during a wildfire. As the population expands into the WUI, homeowners must take responsibility to prepare their homes for wildfire. Photo: Kari Greer. **Bottom:** Of 1,000 homes threatened in the 2016 Cold Springs Fire near Nederland, only 8 burned, due in part to homeowners who readied their properties and followed home ignition zone recommendations. Photo: Wildfire Partners

BACK Mitigation work helped spare this Boulder County home near Nederland during the Cold Springs Fire of 2016. Photo: Wildfire Partners



ADAPT TO WILDFIRE

It's never too early to start protecting your home.
The Colorado State Forest Service can help.



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.....

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OUR MISSION

*To achieve stewardship of Colorado's diverse forest environments
for the benefit of present and future generations*

*The Colorado State Forest Service is a service and outreach agency of the Warner College of
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APPENDIX D
Black Forest Community Wildfire Protection Plan

**Black Forest Community Wildfire
Protection Plan
(BFCWPP)**

11 October 2007

EXECUTIVE SUMMARY

A Community Wildfire Protection Plan (CWPP) is intended to assist residents in an area (the community) to reduce the risk of fire in the wildland/urban (WUI) interface. The WUI is where forest meets urban development – generally where residences are located within treed areas such as the Black Forest (BF). The “community” selected for this analysis is that served by Black Forest Fire/Rescue Protection District.

How does a CWPP help in this process? It describes and plans the actions that individuals and groups of individuals should take to limit the spread of fire and to otherwise reduce threats to life and property.

Reducing wildfire risk requires first identifying the community’s fire-related physical characteristics and classifying the types and severities of risks in the area. This involves understanding the factors that lead to fire ignition and spread, as well as the actions that can be taken to reduce those risks.

Our overall strategy for the BF CWPP is that it will evolve through time, become increasingly detailed, and describe accomplishments to date as well as proposed future actions. This current CWPP version describes our assessment process, some initial conclusions, current accomplishments, and the proposed content of the next version. It represents a beginning, not an end.

The next CWPP will identify and prioritize the risk associated with each Black Forest section (surveyed square mile). It will then recommend plans for moderating risks, both for the Black Forest as a whole and for the most highly threatened areas. These recommendations will include:

- Establishing reduced fuel loads along major roads
- Establishing reduced fuel loads in specific areas
- Reducing the fuel load in the Forest in general
- Thinning trees and promoting forest health
- Establishing defensible spaces around buildings
- Identifying, signing, and prioritizing escape routes
- Ensuring public emergency notification mechanisms are in place and known to the public
- Establishing programs for public education and involvement
- Planning programs to implement and monitor progress.

PREFACE

The factors that create wildfire risk in the wildland/urban interface, wildfire mechanisms, and the list of possible mitigation approaches are virtually identical across communities. What varies are the particular mixes in different areas.

Among the assessment strategies identified in Section 3.1 of this document is “Don’t reinvent.” The authors of this document have taken this strategy to heart. The form and content of this section, as well as much of this document, is based upon the Teller County Community Wildfire Protection Plan. The assessments and conclusions, while perhaps similar in form and level of detail, are completely independent.

The authors of this CWPP wish to acknowledge the debt that they owe to the Teller County authors.

TABLE OF CONTENTS

- 1.0 Introduction
 - 1.1 The CWPP Development Process
 - 1.2 Objectives of the CWPP
- 2.0 Identification and Description of the Community
 - 2.1 Black Forest Physiographic Description
 - 2.2 Land Distribution
- 3.0 Community Assessment
 - 3.1 Assessment Strategy
 - 3.2 Mitigation Principles
 - 3.2.1 Crown Fires vs. Ground Fires and Their Effects
 - 3.2.2 Wildfire Behavior and Fire Suppression
 - 3.2.3 Causative Factors
 - 3.2.4 Thinning
 - 3.2.5 Fuel Breaks
 - 3.2.6 Defensible Space
 - 3.2.7 Mitigation Responsibilities
 - 3.3 Public Lands Assessment
 - 3.4 Private Lands Assessment
 - 3.4.1 Section Value Assessment
 - 3.4.2 Section Risk Assessment
 - 3.4.3 Composite Section Wildfire Vulnerability
- 4.0 Preparedness to Respond
- 5.0 Community Mitigation Plan: Implementation and Monitoring
 - 5.1 Program Goals and Objectives
 - 5.1.1: Reduce Fire Frequency and Severity
 - 5.1.2 Reduce Vulnerabilities
 - 5.1.3 Improve Alerting and Evacuation Capabilities
 - 5.2 Implementation and Monitoring Action Plan
- 6.0 Declaration of Agreement

1.0 Introduction

The Black Forest as it exists today is the result of many influences, but the principle one is human activity during the past 150 years. The historic development of Black Forest is quite similar to most of the ponderosa pine forests in Colorado's lower montane life zone. Before settlement, it burned every five to thirty years—what foresters call a frequent, low intensity fire regime. Such fires burned primarily on the ground and thinned the trees. The forest structure was quite different from the present. The forest was open with 30 to 50 large, mature trees per acre, and widely spaced younger trees grew in the openings.

With settlement, the primeval forest was extensively logged, and the present forest grew back after the era of logging. Fires were suppressed, and it grew to maturity without thinning by man or fire. Consequently, the present forest is unnaturally dense. Its canopy is closed and trees are stressed for light, water, and nutrients. The forest is now susceptible to disease, insects, and intense fire. These intense fires - called crown fires - are the most fearsome of all wildland fires. As fire reaches the tops of the trees, it moves through the closed forest canopy producing extreme heat and defying control efforts. Crown fires pose extreme dangers to firefighters, threaten lives and property, and cause severe environmental damage.



1Figure 1: A Crown (Pine Glen) Fire
(Source: BFFRPD)

This danger has been recognized by foresters for a long time. The devastating fire season of 2002 forced many Black Forest residents to acknowledge the potential severity of the problem facing them. Like many of the counties that suffered during that time, the Black Forest community had not had a wildfire to remove the ever-increasing fuel load. And like them, we also had a worrisome wildfire. We were fortunate that the ignition location and wind direction combined to allow the Pine Glen fire to be fought successfully over a period of several days with no loss of life or structures. Without a planned and vigorous effort to reduce the risk and contain the spread of wildfires, Black Forest will become more susceptible to this threat in the future.

The Black Forest community is primarily a patchwork of five-acre residential lots. Some considerably larger landholdings exist as well as some smaller residential lots that preceded zoning, are within a water district, or are clustered within an overall subdivision that approximates five-acre zoning. Many areas are heavily forested while others are essentially open prairie, with perhaps a few isolated trees. The entire area is considered to be a wildland/urban interface (WUI). Black Forest trees are primarily ponderosa pine, with a few Douglas fir, aspen, cottonwoods, and Gambel oak. Our climate is naturally semi-arid and the drought conditions of recent years have made the overgrown forest even more vulnerable to crown fire. The area continues to grow with much of the housing growth within the forested area.

The area receives fire suppression from the Black Forest Fire/Rescue Protection District (BFFRPD), which has mutual aid agreements with all surrounding fire agencies, including the City of Colorado Springs. Water is supplied via hydrants in the Park Forest Water District on the southeastern side of the area, and via tanker shuttle elsewhere, although most recent subdivisions have installed 10 thousand to 30 thousand gallon underground tanks from which water may be drafted.

The Black Forest community has also benefited greatly from the 14 years of the slash/mulch operation that has substantially reduced our fuel load. Run by the Slash and Mulch Committee (SAMCOM), manned by numerous volunteers, and under major sponsorship of El Paso County Solid Waste Management, this program has been exceptionally successful. Located southeast of the intersection of Shoup and Herring Roads, the site accepts trees up to eight inches in diameter, as well as pine needles, and hires a commercial tub grinder to produce mulch, which is then provided to all who want it. The entire operation is free, although donations to Care and Share are gratefully accepted, and there is a charge for a loader if one chooses not to load mulch.



Figure 2: Slash/Mulch Operation (source: SAMCOM)

In late 2003, the incentive for communities to engage in comprehensive forest planning was given new and unprecedented impetus with the enactment of the federal Healthy Forests Restoration Act (HFRA). In order for a community to take full advantage of this new opportunity, it must first prepare a Community Wildfire Protection Plan (CWPP).

In early 2006, increasing concern amongst citizens, BFFRPD officials, forest management agencies, and El Paso County officials led to a growing consensus that a CWPP would be beneficial. The Black Forest Community Club (BFCC) decided to sponsor such an activity and created a standing Committee to undertake the effort.

1.1 The CWPP Development Process

The BFCC CWPP development committee consists of the following volunteers:

Chairman: Dan Gorton, System Manager, Pikes Peak Regional Communications Network

Ron Brown, Board Member, BFCC

Peter Burleson, Chair, Board of Directors, BFFRPD

Mary Hammel, BFCC

Chuck Lidderdale, Vice President and Webmaster, BFCC

Walt Seelye, firefighter and Firewise Assessment Coordinator, BFFRPD

Ruth Ann Steele, Manager, Black Forest Slash/Mulch Program

Dave Ury, Fire Chief, BFFRPD

The expertise and contributions of the following advisors proved invaluable:

Mark Johnston, Deputy Director, El Paso County Forestry and Noxious Weed Division
Dave Root, Assistant District Forester, Colorado State Forest Service (CSFS)

At the preliminary meeting of the development committee, it was recognized that the full level of detail desired for the plan would take considerable effort over a sustained time period. The Committee therefore resolved to produce the plan in multiple phases – an initial plan that would meet all requirements of the HFRA, and subsequent versions that would provide finer-grained descriptions of the topography, conditions, ownership, risks, and mitigation recommendations for smaller areas within the BFFRPD. A major objective of this first phase was therefore to establish a process and structure that would support this evolution over time. We intend that the CWPP become a component of an overall Community Emergency Preparedness Plan that addresses all emergency risks. This document represents the first step in the CWPP process.

1.2 Objectives of the CWPP

The overall objective of the CWPP is to provide guidance to community agencies and individuals that will reduce the risk to life and property due to wildfire. Individuals, agencies, and organizations can accomplish this objective together through the effective education, cooperation and coordination of available resources. There are many sub-objectives, including:

- Promote thinning

- Promote cleanup of slash and other combustibles

- Establish/enhance fuel break buffer zones

- Improve defensible space

- Identify high-risk areas and recommend mitigation alternatives

- Design and establish programs to:

 - Increase public awareness of fire-related risks, remedies, and advantages

 - Train homeowners about fire defensive methods

 - Inform residents about evacuation communications and routes

 - Provide incentives for fuels reduction

 - Assist firefighters in real-time priority assessment through prior property assessments

- Create a basis for grant funding concerning:

 - Slash/mulch operation expansion

 - Establishment of evacuation routes with reduced fire risk

 - Proactive community fire/safety programs

 - Forest health improvement

 - Homeowner assistance with mitigation expenses

2.0 Community Identification and Description

2.1 Black Forest Physiographic Description

Located north and somewhat east of the City of Colorado Springs, yet south of El Paso County's northern border, the Black Forest community has primarily become a bedroom community of the City. For purposes of this plan, the Committee has determined to use the borders of the BFFRPD to identify the community. Approximately 46 square miles in size, the Black Forest ranges in elevation from 6500 ft at its southern end to 8000 ft along portions of the Palmer Divide. The vegetation is primarily ponderosa pine and grasslands.

Ponderosa pine ecosystems such as Black Forest are naturally subject to frequent, low intensity fires. The result of such fires is to maintain the forest in an open, park-like condition. Trees would be large and widely spaced with a grassy understory. After a century of fire suppression, Black Forest has assumed an unnatural condition in which the trees are extremely dense and severely stressed from competition for light, nutrients and water. The stressed trees are susceptible to attack by bark beetles—particularly mountain pine beetles and ips beetles.

Furthermore, large pockets of trees are infected with dwarf mistletoe. Over a period of years, this parasitic plant slowly kills trees by robbing the host tree of food and water. As the vigor of infected trees declines, the host becomes susceptible to attack by bark beetles. Currently there are many more trees infected with mistletoe than are killed by bark beetles. The large number of infected trees in Black Forest indicates that the potential for a devastating beetle epidemic, such as the one in Grand, Summit and Routt Counties is real. The recent drought has exacerbated this threat.

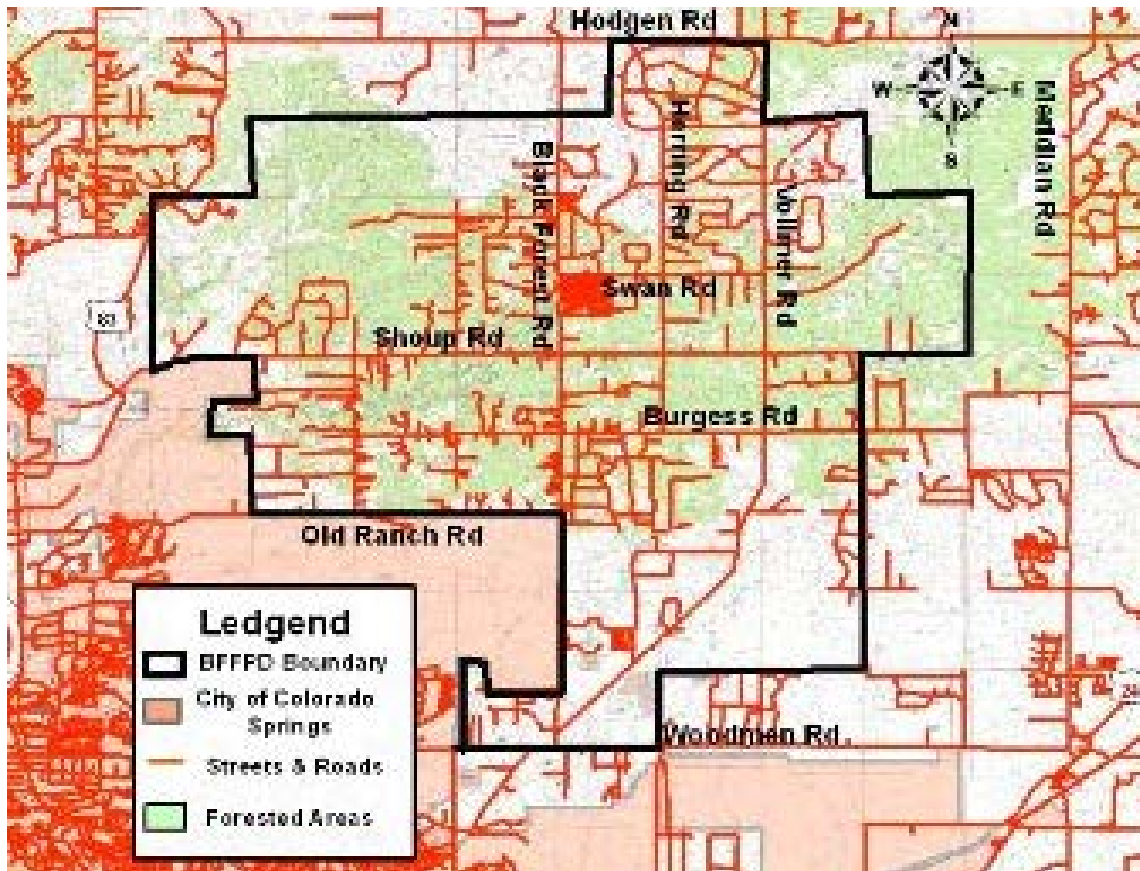


Figure 3: Black Forest CWPP Boundary Map.

2.2 Land Distribution

Land distribution in the Black Forest is primarily private residential lots. These lot sizes vary from five to less than one acre. There are no parcels of federal land within the District. Some larger private parcels that were once ranches remain, but the trend over the last decade is that most of these have been sold for development. There are two parcels of public land, the Black Forest Regional Park owned by El Paso County and The Black Forest School Section owned by the public under trusteeship by The State Board of Land Commissioners.

3.0 Community Assessment

3.1 Assessment Strategy Before getting into the details of hazard identification, the Committee defined a strategy to guide how the entire project would be pursued. The following are the key strategies that guided the work.

Empirical: One key element of the project strategy was a commitment to be empirical. In other words, the Committee felt it essential to base its analysis and conclusions on observable, measurable, objective information.

Map oriented: Given the large scale of this project and the huge volumes of data involved, the Committee quickly decided to use digital maps as the basis for organizing hazard data. The El Paso County Information Services Department has excellent computer-based mapping capabilities. Tools made available to the group by the County IS department included mapping tools that can include many “layers” of data including topography, roads, infrastructure, fuels profiles, and population densities.

Highest Priorities First: It was clear to Committee members from the beginning that it would be easy to get consumed with details, threatening the completion of the plan. Accordingly, it was agreed at the beginning that study efforts would be comprehensive (in other words cover the entire area and all of the key factors) and identify the overall highest priority issues. But, the strategy was also selective – only certain selected priority issues were scrutinized to the level of detail needed as a foundation for recommendations. This meant for example, that detailed mitigation plans, cost analyses, and so on would be addressed in future versions of the CWPP. We have concentrated on issues that need to be addressed immediately, and though long-term goals are identified, they are not addressed in detail. The Committee expects future versions of this living document to provide increasing levels of detail as necessary.

We did not attempt to make specific, detailed mitigation recommendations for each of the many subdivisions in the Fire Protection District. Teller County has developed an abbreviated version of their CWPP for use in discrete subdivisions. These neighborhood CWPPs make use of the information developed for the general Teller County CWPP, but make detailed mitigation recommendations specific to a particular neighborhood. Neighborhood CWPPs have been written for communities as large as several hundred houses and as small as five houses. We believe this approach is adaptable to Black Forest and will be pursued in the future.

Don’t reinvent: An important aspect of the CWPP is to provide property owners with information on what they can do to increase safety. Property owner projects involving “defensible space,” structure ignitability factors, thinning specifications, and neighborhood fire protection require access to how-to information as well as information on sources of help such as fire mitigation grants.

A wealth of high quality information on all these topics is readily available. Accordingly the CWPP does not attempt to restate or reinvent this kind of information – rather the CWPP refers to major sources where citizens and organizations can find help.

Multiple-level Assessment: A primary purpose of the CWPP is to be a method of communicating to both public entities and residents, exactly what the community’s priorities are to reduce the threat that immersion of structures within a forest poses to community life and property.

A second purpose of the CWPP, however, is to identify hazard issues on specific private and public lands and point to ways to reduce vulnerability to wildfire hazard.

These two objectives are quite different. They require different tools, different criteria for ratings, and have different kinds of recommendations. Accordingly, the CWPP analysis and recommendations will be performed in multiple phases.

Section Assessments: On behalf of the Committee, a number of community volunteers will perform on-site assessments of 14 different factors (see Table I) in each of 46 sections across the area. Many volunteers have already been identified from the BFFRPD, the SAMCOM, the Community Club, and the community at large. Volunteers will be trained by professional staff from the Fire District. The data collected will be summarized into six major factors as shown in Appendix III. These six factors contribute to the overall hazard rating for both risk of crown fire and section preparedness for wildfire. It is important to understand that these ratings will be for each section as a whole – not for individual properties within a section. They will represent an averaging or overview across the entire section. Accordingly, certain specific areas within each section will undoubtedly differ from the overall section rating.

Integrate with the Federal Emergency Management Agency (FEMA) All-Hazard Plan: It was noted that much of the work being undertaken would have direct application to FEMA's required Pre-Disaster Hazard Mitigation Plan. It is intended that this CWPP become the Wildfire Hazards section of an all-hazard plan for the Black Forest area.

3.2 Mitigation Principles

The Committee will base its data collection, data analysis, and final recommendations on several well-established principles of wildfire risk mitigation. A few of the key principles underlying the overall project are highlighted here.

3.2.1 Crown Fire vs. Ground Fire and their Effects

Although there are an infinite variety of wildfire behaviors, it is useful in the ponderosa forests that dominate the Black Forest to distinguish crown fires from ground fires. Crown fires are wildfires that move in dense forest and burn from the ground all the way through the tree crowns (see e.g. Fig. 1). They jump downwind by spotting and torching. They destroy forests, killing all or most trees, sterilizing soils, and accelerating erosion. In contrast, ground fires burn through a forest with flames staying nearer the ground and generally not reaching up into the canopy. The effects of ground fires (Fig. 4) are often beneficial to the health and safety of the forest and long-term damage to the forest and watersheds is minimal. The problem is ensuring that they are contained effectively.



Figure 4: Ground fire near Grant Village, Yellowstone National Park
Jim Peaco, public domain

The mitigation strategies followed by the committee were based on the notion that ground fires will occur, and there is minimal (but some) opportunity to reduce the incidence of wild fire ignitions. The goal is to reduce the likelihood of crown fire in any area. Any such fire within the area threatens values such as lives, structures, and infrastructure. Further, the goal is to provide areas or “zones” in the forest where any crown fire can be rapidly contained and forced to “lay down” into a more benign ground fire.

3.2.2 Wildfire Behavior and Fire Suppression

Any crown fire in this area would be immediately confronted by the combined resources of all nearby fire departments, and would undoubtedly be supported by state and perhaps federal entities as well. If a fire threatens to exceed the suppression capabilities of the BFFRPD, mutual aid will be sought from neighboring fire districts. If a fire should exceed these resources, additional aid will be sought on a State or National level. As more aid is needed it follows that it will take longer to arrive. Because crown fires are difficult to suppress, it is important to establish in advance defensive barriers (akin to fuel breaks) that will help slow the advance of a fire, and give available resources a chance to contain it.

3.2.3 Causative factors

Crown fires will usually occur in areas of increased forest density, steep terrains, plentiful “ladder fuels”, and lower tree moisture levels. Ground fires will usually be confined to

areas where trees are thinned with substantial gaps in the canopy, trees are trimmed of low branches, ladder fuels are removed, moisture levels are higher, and where concentrations of downed woody fuels have been removed.

3.2.4 Thinning

A compelling body of evidence demonstrates that by performing thinning in an otherwise crown fire-prone forest, its safety can be dramatically enhanced. Thinning means simply eliminating a sufficient number of trees to provide a recommended spacing between them. Experience demonstrates that even a dangerous crowning and torching fire that advances into a forest area that has been properly treated with thinning procedures, may “lie down” to become a manageable ground fire. Thinning also promotes forest health.

3.2.5 Fuel Breaks

A fuel break, (also called a shaded fuel break) is an area where trees have been thinned to create an open forest canopy, ladder fuels have been eliminated, and ground fuels substantially reduced. Much of the mitigation strategy recommended by the Committee is based on creating fuel breaks throughout the forest. Areas in which the fuel load has been greatly reduced should be designed to allow any advancing crown fire to transition to a ground fire and hence give a possible opportunity to suppress the wildfire before it spreads. Although Black Forest residents have chosen to live here because of the forest, the risk of significant wildfire is such that we may have to sacrifice a few trees now to potentially save many in the future. Residents should be aware that establishment of strategic fuel breaks are not a substitute for restoration of the forest to healthy conditions. Fuel breaks are effective ways to slow the spread of a fire, but they will not prevent loss of property or damage from a fire burning between fuel breaks. By any measure, the best method of fire mitigation is restoration of the forest to pre-settlement conditions on a forest-wide level.

3.2.6 Defensible Space

If sufficient defensible space is provided surrounding structures, a wildfire could advance through and around structures and other values without causing serious damage. Clearly, defensible space for a ground fire is more feasible than defending against an advancing crown fire.

As previously noted, wildfires often exceed the ability of available fire fighting resources, and it is impossible to defend every structure. Homes with defensible space have been shown to have a significantly greater chance of surviving a wildfire without the assistance of firefighters.

3.2.7 Mitigation Responsibilities

The Black Forest area includes no federal property, and the amount of County, State, and other public property is quite limited. The Fire Department does not have mandated

responsibility for preparing private property for fire safety. Therefore, the primary opportunity to decrease risk from wildfire lies in the hands of private property owners acting individually or as a community.

3.3 Public Lands Assessment

Aside from fairly small properties associated with Edith Wolford Elementary School, and the BFFRPD, etc. there are only two sizable parcels of public lands: the School Section, and the Black Forest Regional Park and collocated El Paso County Department of Transportation Road Maintenance facility, which belong to the County. A “section” is a square mile of land predefined by official survey and identified by “Range,” “Township,” and “Section” numbers. Appendix 1 identifies all sections in our study area in three ways: 1) by R, T, and S; 2) by the associated county five-digit reference number; and 3) by a short description based on a road intersection or geographical feature.

The School Section (16) is one of many sections of School Trust Land in Colorado. It includes the ten acres on which the School in the Woods is located, owned by Academy School District 20. The remaining acres of the parcel are administered by the Board of Land Commissioners. There are currently three lessees: School District 20 holds the surface lease, El Paso County holds a lease around the perimeter for the trail maintained by the County Trails Association as well as for the property used by SAMCOM for the slash/mulch site, and the Colorado State Forest Service (CSFS) holds a silvicultural lease. All forest management is done by the CSFS as agent for the Land Board.

The entire section was thinned around 1980 to restore the forest to pre-settlement conditions. Since the initial thinning, dense regeneration has grown under the open forest canopy. Most of the forest management activity during the last decade has centered on thinning of the regeneration. Combinations of commercial forest product sales, prescribed burning and noncommercial thinning have been used to thin the young trees. About one third of the regeneration has been thinned. A shaded fuel break is completed along the northern portion of the section from the Slash/Mulch site to the meadow at the corner of Shoup and Vollmer Roads. Another fuel break has been established along the west side of the School in the Woods boundary, and District 20 has put considerable effort into thinning their ten acres. Currently a new forest inventory is being completed on the section, and a revised management plan will be completed within a year.

All public property could benefit from continued selective thinning and ground fuels removal.

3.4 Private Lands Assessment

Other than the overall assessment (see Section 3.4.2.1), the committee's consideration of private lands has currently been limited to planning two overall measures at the Section level (the first is complete based on recent information and included): Section Value, and Section Wildfire Risk. The former attempts to measure the relative loss if an entire Section were to burn; the latter the relative likelihood of such an event happening. We recognize that such an event is highly unlikely; nonetheless these measures are needed to help identify the most severe risks and thereby direct resources toward their mitigation. Also, identifying hazards at the section level will help to increase citizen and organization awareness and encourage projects to increase safety.

3.4.1 Section Value Assessment

In order to help properly establish priorities for risk remediation, some concept of section value is needed. One must realize at the outset that this is an attempt to think the unthinkable, and to value the invaluable – namely to say that if a wildfire were to destroy all the property within a section, how would one prioritize the loss of that against some other section. To its owner, the loss of one individual parcel can range from minor to catastrophic, depending upon factors such as insurance, whether or not there is a dwelling on the parcel, one's individual finances, etc. One also must work with some version of "official" as opposed to subjective data.

We have collected data from the El Paso County Assessor's Office that identifies the number of parcels in each section (assumed for our purposes to represent the number of dwellings), total market value of each section as reported by the Assessor's office, and total assessed section value. We immediately realized that simply using total value as a single measure would be an inappropriate measure of Section Value, since the loss of one \$900,000 "mansion" should not count as equal to the loss of three \$300,000 dwellings.

We therefore created indices identifying both the relative number of parcels and relative values for each section. To do this, we added up the total number of parcels and divided by the number of sections to calculate the average number of parcels per section within the BFFRPD area. Then we divided the number of parcels in each section by this average to obtain a "Parcel Factor" (PF) – a number indicating the density of parcels relative to the average. We also calculated a "Value Factor" (VF) in a corresponding manner. Note that if all sections were completely homogeneous – i. e. if every section had the same number of parcels with the same aggregate market value, then all these factors would be exactly one. By multiplying these two indices we calculated our (admittedly somewhat subjective) single value combining the number of parcels with total market value. We then divided the 46 sections into three roughly equally sized categories: 1, 2, or 3, with 1 being the highest priority. These results are presented in Appendix II. The group of sections with the highest value all has PF x VF values above 1.6. This information will be updated (new Assessor's data will be used) in each version of the CWPP.

3.4.2 Section Risk Assessment

3.4.2.1 Initial Risk Assessment

The initial community assessment was accomplished using maps and the intimate knowledge of the Community by BFFRPD, CSFS and CWPP Committee personnel. Fire behavior is determined by three factors: weather, topography and fuels. In the Black Forest fuels are the primary consideration for determining risk. Weather is variable, and cannot be determined in advance of a wildfire. The topography in Black Forest consists of rolling terrain that is generally consistent over the entire district. Exceptions are a few hilly areas and river valleys. Therefore, terrain becomes a consideration only on a small scale. Vegetation varies from open grassland, to small areas of Gambel oak, to dense forest. It is this vegetation that will primarily determine the hazard.

Using aerial photographs it was possible to determine which portions of the District could be labeled low, moderate, or high for fire risk.

The general criteria for each rating were determined as follows:

Low: Areas of open grassland or grassland with scattered trees. Any trees are widely spaced with canopy separation greater than 20 feet and few ladder fuels. Riparian areas with primarily deciduous trees are also considered low.

Moderate: Large areas of open forest cover where trees are clumped or thinned so that there is an average crown spacing greater than 5 feet. Ladder fuels are few. This approximates a thinned, well restored forest.

High: Areas of dense forest where the canopy is closed, and crown fires are likely. Ladder fuels are present in large amounts. The high category contains many individual parcels where landowners have practiced good forest management. However, unless extensive contiguous parcels have been thinned, the Committee did not attempt to account for these in the overall assessment. Mapping of these individual parcels must wait until the smaller scale assessment is complete.

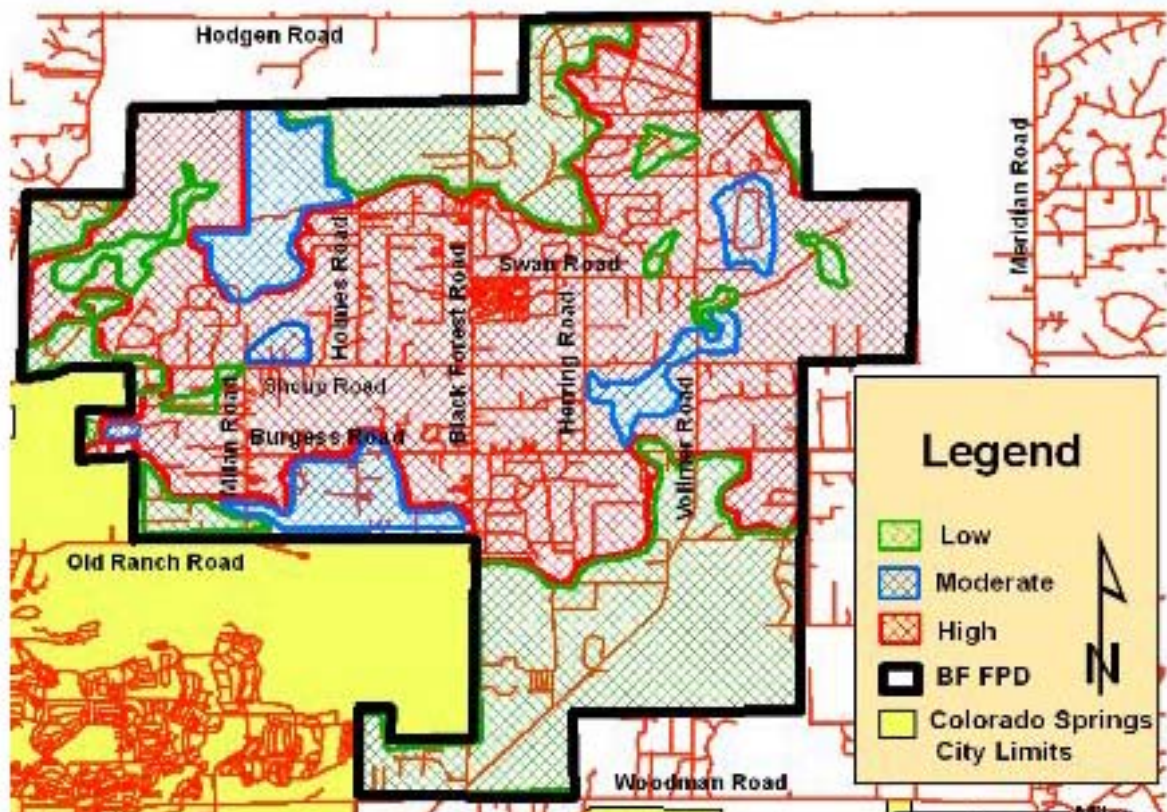


Figure 5 Black Forest CWPP Boundary Map

3.4.2.2 Planned Assessment Process

The next version of this CWPP will employ the following process.

3.4.2.2.1 Identify basis for assessment data

The Committee agreed to assess overall hazard profiles at an intermediate level and so decided to create a single general assessment for each section within the BFFRPD area. It was immediately clear that the satellite and aerial photo imagery data available through our GIS-based tools were not detailed, accurate, or recent enough to provide meaningful section-level assessments. It was decided therefore, that a new on-site assessment of each section would be performed.

3.4.2.2.2 Section Data Collection

A working group developed an assessment data collection plan and corresponding Data Collection Forms to collect data on the hazard factors in each section. Blank Section Wildfire Hazard Data Collection Forms are shown in Appendix IV. Our plan is that forty-six packages containing these section forms, a section map, and preparation instructions be given to volunteers who will be trained by BFFRPD personnel in

assessment techniques. These volunteers will visit each section to collect the data. All returned form data will be transcribed into Excel spreadsheets for summary analysis.

3.4.2.2.3. Section Wildfire Vulnerability

The six major factors (all capital letters) identified in Table 1 are intended to portray a general measure of the overall section's vulnerability to wildfire of any kind and the vulnerability of structures to damage or loss in a wildfire. Except for the "fuel breaks" entry, which applies (perhaps not perfectly equally) to an entire section, each risk factor is a composite of data collected over all section roads, structures, and topography. Please note that "fuel breaks" is in quotes because it is a shorthand for our non-traditional use of the term. Details of the process used to turn raw data into section values appear in Appendix III. In arriving at an overall risk factor, the six major factors are not equally weighted. The factors are listed in priority order, and are weighted in descending order (from 6 for Accessibility to 1 for Utilities). Thus Fire Protection, for example, is weighted as a 3.

Table 1. Section Risk Factors

Factor (Weight)	Description
ACCESSIBILITY (6)	
Ingress/Egress	Number and conditions of roads in/out of section
Average Road Widths	Road measurement in feet
Road Conditions	Road steepness and usability
Road Termini	Suitable turnaround on dead-end roads
FIRE BEHAVIOR (5)	
Fuel Density	Rating of density and type of fuels in section
Slope	Index identifying presence of significant slopes
SECTION ISOLATION (4)	
"Fuel Breaks"	Number of miles of section "fuel breaks" identified
FIRE PROTECTION (3)	
Response Time	Based on distance from Fire Department
Water Availability	Access to hydrants, pump sites, or draft sources
INDIVIDUAL PROPERTIES (2)	
Materials (predominant)	Flammability of siding and roofing
Inadequate Driveway	Driveway over 500' in length without turnaround, Or too narrow or winding for adequate access

Address Signs	Houses have visible address signs
Defensible Spaces Completed	Extent to which most structures are prepared with defensible spaces
UTILITIES (1)	
Overhead electric lines	Placement of electric lines

3.4.2.4 Section Fire Hazards

While mapping the section results will assist in the prioritization of fuels mitigation, the actual results will also be helpful in planning for each section. These data categories will be defined and trained to data collectors by fire professionals from BFFRPD. The decision was made to publicize the status of each section in the ratings, but to avoid making specific recommendations to individual sections. Categories were established to indicate the level of hazard, but individual fuels mitigation project plans should eventually be developed for each area. These results are available to the public both through this plan and through the mitigation efforts that will need to be planned and agreed to by participating residents. (See Appendix III). The information planned for this section also includes a pie chart depicting the overall risk ratings for the 46 sections.

3.4.3 Composite Section Wildfire Vulnerability

This portion of the report will provide a composite assessment, in either graphic or tabular form, of the results of Appendices II and III. It will highlight those Sections in the Black Forest that have both the highest value and the highest risk.

4.0 Preparedness to Respond

El Paso County fire departments have considerable experience responding to wildfire incidents, although much of this has been gained through supporting other County or State efforts. The several fire incident responder agencies have relatively mature capabilities, plans, resources, and infrastructure. A description of this extensive capability is beyond the scope of this CWPP but thorough documentation is available in other publications. One key document to reference is the “El Paso County Annual Operating Plan” (ELCAOP), which describes operational plans, standard operation procedures, mutual aid agreements, and cooperative agreements. Agencies that participate in the ELCAOP include all local Fire Departments, US Forest Service, Colorado State Forest Service, Bureau of Land Management, the City of Colorado Springs, and the National Park Service. Another document reference is the El Paso County FEMA All Hazards Plan.

5.0 Community Mitigation Plan: Implementation and Monitoring

5.1 Program Goals and Objectives:

We recommend that local residents, County, and State agencies cooperate in supporting programs to increase the safety and health of our forests on both private and public lands. These programs should address the following goals and objectives:

5.1.1 Reduce Fire Frequency and Severity

- Objective #1; Reduce the fuel load at strategic locations in the BFFRPD
 - o Action #1; Identify model(s) for wildland fire risk analysis.
 - o Action #2; Identify high risk and high priority properties within the BFFRPD (see Section 3.4.4).
 - o Action #3; Develop partnerships and funding opportunities to execute the fuels mitigation projects.
 - o Action #4; Support funding for the Slash/Mulch Program from private and County funds, and State and Federal grants.
- Objective #2; Improve overall health of privately owned forests
 - o Action; Establish informative advocacy programs to encourage residents to improve forest conditions. Proper forest management to improve forest health will also mitigate fire hazards.
- Objective #3; Increase voluntary landowner responsibility for fuel reduction
 - o Action #1; Include CWPP in Black Forest Website for public access.
 - o Action #2; Strengthen public education efforts and education.
 - o Action #3; Increase public awareness and support of County mitigation efforts.
 - o Action #4; Collect and monitor statistics concerning BFFRPD property firewise evaluations.

5.1.2 Reduce Vulnerabilities

- Objective #1; Improve the defensibility of residential and commercial properties against wildland fire.
 - o Action #1; Identify and implement programs to reduce fire loads along roads identified as evacuation routes (Black Forest, Shoup, Burgess, Vollmer, Milam, Herring, Swan, and Hodgen between Black Forest and Vollmer Roads) and along the gas pipeline to assist firefighters in keeping fires from

jumping across the barrier. A grant from the CSFS was obtained to help El Paso County to thin or eliminate trees along these roads to the full right-of-way (60'). To date, Black Forest Road (from tree-line to tree-line), Herring Road (from Burgess to Lakeview) and Burgess Roads have been completed. Adjacent landowners were notified in advance, and could negotiate keeping particular trees.) Priorities for next year include Vollmer and Swan roads. The Committee will also request Mountain View Electric to remove trees within this right-of-way as opposed to selectively topping them. These roads are also defined as primary routes for the ingress/egress of firefighting equipment.

- o Action #2; Identify and institute programs create areas of fuel limitation (large defensible spaces) in certain areas of the Black Forest.
 - o Action #3; Implement voluntary programs for homeowners and businesses in WUI.
 - o Action #4; Encourage BFFRPD to enforce codes and regulations to reduce ignition potentials and increase defensibility of structures and property.
 - o Action #5; Encourage public education at all levels regarding forest health and wildfire occurrence as a natural hazard they can mitigate.
 - o Action #6; Establish Black Forest as a recognized "Firewise Community".
- Objective #2; Reduce vulnerability of critical infrastructure to wildfire impacts
 - o Action #1; Identify and prioritize areas at risk.
 - o Action #2; Develop and prioritize mitigation projects.
 - o Action #3; Pursue funding for prioritized projects.
 - o Action #4; Work with the County Department of Transportation to establish signage along principle evacuation routes.

5.1.3 Improve Alerting and Evacuation Capabilities

- Objective #1; Establish and improve mechanisms for alerting residents of the need for evacuation.
 - o Action #1; Promote public awareness of the Early Warning Notification System established by the El Paso-Teller County E9-1-1 Authority.
 - o Action #2; Work with the Office of Emergency Management to use the Emergency Broadcast System.
- Objective #2; Identify and prioritize escape routes.
 - o Action #1; Ensure the public is informed in advance of the planned routes. These are the roads identified above by the BFFRPD: Black Forest, Shoup, Swan, Burgess, Vollmer, Milam, Herring, and Hodgen.
 - o Action #2; Mark each evacuation route with adequate signage.

- o Action #3; Establish responsibility within the BFFRPD for identifying specifically which evacuation route or routes should be used in a particular wildfire.
- o Action #4; Encourage landowners adjacent to escapes routes to participate in thinning programs to increase the safety of the escape routes.

5.2 Implementation and Monitoring Action Plan

This first CWPP is a starting point. The implementation work lies ahead, and we recommend that the Committee take a leadership role in encouraging implementation. Besides specific initial recommendations, the Committee recommends the following actions to continually enhance the CWPP, and improve community effectiveness in accomplishing wildfire hazard mitigation in the future.

Re-charter and Reorganize the CWPP Committee. The CWPP needs to be a living document. We believe that upon acceptance and publication of the first edition CWPP, the BFCC Board and membership should continue to support a CWPP Committee.

Based on the somewhat different role, now that an initial CWPP is done and based on Committee working experience, we recommend that the BFCC Board establish a Chairperson from its membership and retain the multidisciplinary profile and citizen participation of the CWPP Committee.

The CWPP Committee should be responsible for establishing a working Task Plan that includes the Actions summarized below:

Projects Oversight: The re-chartered Committee should monitor CWPP recommendations – treating them as projects to implement the Plan. The Committee should monitor all ongoing projects’ funding, timing, priorities, and progress against schedule and work to facilitate progress. A map or other suitable means may be useful in tracking progress. Project status along with recommendations should be reported to the BFCC, BFFRPD, CSFS, and El Paso County. The Committee should submit an annual report to the BFCC at its first general meeting of each year.

Special Projects: The projects for CWPP-recommended high priority areas should be treated as special collaborative projects by defining and encouraging private-land projects that will complement the public-land projects to achieve the overall objectives for threat reduction in specific areas. The Committee Chairperson should actively help drive these projects, providing the leadership to organize community groups, homeowners associations and the CWPP Committee project teams.

Citizen Information Center: Volumes of information are available for citizens to help plan and execute projects to increase safety of their communities. So much information is available in fact, that sorting through it is daunting to the average

citizen. We recommend that the Committee work with the Colorado State Forest Service to establish a specific resource – perhaps via a web site - where citizens can have one-stop-access to a set of resources specifically organized to support citizen and Home Owner Association efforts to perform wildfire threat mitigation including defensible space projects. Resources available at this “center” should include:

- Printed educational material selected specifically for Black Forest, such as SAMCOM’s *Forestry Information Guide*
- Lists of sources for planning help
- List of contractors and consultants
- List of funding sources including specific guidance on how to apply for grants.

SAMCOM already maintains a large library of information for distribution at the slash/mulch site. The committee should work with SAMCOM to expand their efforts.

Publicize and Promote the CWPP: We recommend that each local agency (BFCC, BFFRPD, churches, etc.) actively help to publicize and promote the CWPP using their existing resources like publications and websites. For example, the Black Forest Festival could include a manned CWPP booth every year to help communicate with and involve our citizens. A “speakers list” may be useful so interested groups can have a standardized and sanctioned presentation on the CWPP itself and extended information on how organizations can proceed with projects. Candidate speakers are CWPP Committee members and other key people qualified for the list.

Additional promotion opportunities are publicizing good community projects, and establishing a recognition program to acknowledge projects and perhaps individuals that support the program goals. The CWPP Committee could publicize the need for action and attract volunteers by providing articles for the BFCC monthly newsletter.

Continue the Slash/Mulch Program: For over 14 years the County has sponsored a program that established a site where citizens can take slash material for disposal. This promotes individual citizen activity to reduce hazardous excessive vegetation on their property. Material is chipped into mulch at the site and made available for citizen use. The program has been very successful, growing, and effective in accomplishing its goals. Continued funding should be sought and the program continued.

Responder Needs Assessment: The Committee recommends that a project be established to support the BFFRPD in the systematic analysis of needs to improve response to wildfire incidents.

Continue Priority Area Identification: As progress is made on the initial priority areas identified in this CWPP, the Committee must continue to analyze threats

and prepare additional priority recommendations for subsequent treatment projects.

Involve Insurance Companies: To the extent possible, those property owners or areas that have succeeded in reducing the risk of their properties to wildfire should be acknowledged by their insurance companies through reduced insurance rates. Such a financial incentive may help motivate some owners to reduce risks. Insurance Companies should be encouraged to recognize the accomplishments of the Black Forest community with appropriate rating improvements and rate reductions.

6.0 Declaration of Agreement:

6.1 CWPP Committee

The members of the Black Forest CWPP Committee hereby recommend adoption of this CWPP.

MEMBER Signature

Ron Brown	_____
Peter Burleson	_____
Dan Gorton	_____
Mary Hammel	_____
Chuck Lidderdale	_____
Walt Seelye	_____
Ruth Ann Steele	_____
Dave Ury	_____

6.2 Related Organizations

Representatives from each of the following organizations have expressed concurrence with the adoption of this CWPP.

- Neighboring Fire Districts
 - Colorado Springs Fire Department
 - Donald Wescott Fire Protection District
 - Falcon Fire Protection District
 - Tri-Lakes Fire Protection District
- El Paso County Natural Resources Division
- The Bureau of Land Management
- The Slash/Mulch Committee (SAMCOM)

6.3 Formal Adoption

The following organizations participated in the development of the document, and adopt this CWPP for the Black Forest community.

Black Forest Fire/Rescue
Black Forest Community Club
Colorado State Forest Service
El Paso County (BoCC)

APPENDIX I

SECTION IDENTIFICATION

El Paso County uses the standard state identification (Range, Township, and Section) nomenclature, but also has generated a shorter (5 digit) version based on R, T, and S, that appears within County-supplied map sections. Since our section assessment volunteers are using these maps, this appendix both provides a cross-reference between the R, T, and S identifiers and the five-digit version, as well as a text description by which readers may identify sections of interest.

For those interested, this paragraph defines how the five-digit form is generated from the R, T, and S. First, directional suffixes (W and S) are dropped from the R and T. Second, the leading digit is dropped from the “R” (all are 6’s). Third, the leading digit is dropped from the “T” (all are 1’s). Next, a zero is added at the end of the S. And finally, the order of the R and T are reversed. Thus, R65WT16SS4 becomes 65040.

#	R	T	S	Ref	Description
1	65	11	28	51280	SW of Vollmer and Hodgen
2	65	11	29	51290	SE of BFR and Hodgen
3	65	11	30	51300	SW of BFR and Hodgen
4	65	11	31	51310	W of BFR; Connaught Drive
5	65	11	32	51320	E of BFR; W of Tannenbaum
6	65	11	33	51330	Tannenbaum; Wildridge
7	65	11	34	51340	Coachman
8	65	12	02	52020	Headwaters of Snipe Creek
9	65	12	03	52030	NE of Vollmer and Swan
10	65	12	04	52040	NE of Swan and Herring
11	65	12	05	52050	NW of Swan and Herring
12	65	12	06	52060	NW of BFR and Elementary
13	65	12	07	52070	NW of BFR and Shoup
14	65	12	08	52080	Brentwood (SE of BFR and Swan)
15	65	12	09	52090	NE of Shoup and Herring
16	65	12	10	52100	NE of Shoup and Vollmer
17	65	12	11	52110	NE of Shoup and Blue Spruce
18	65	12	15	52150	NE of Burgess and Vollmer
19	65	12	16	52160	School Section
20	65	12	17	52170	NW of Burgess and Herring
21	65	12	18	52180	NW of BFR and Burgess
22	65	12	19	52190	SW of BFR and Burgess
23	65	12	20	52200	SE of BFR and Burgess
24	65	12	21	52210	SW of Burgess and Vollmer
25	65	12	22	52220	SE of Burgess and Vollmer
26	65	12	27	52270	NW of Raygor and Stapleton
27	65	12	28	52280	Vollmer and Wildflower

28	65	12	29	52290	SE of BFR and Baker
29	65	12	32	52320	Vollmer, Azare Road
30	65	12	33	52330	E of BFR (1-2mi) and N of Woodmen (1-2mi)
31	65	12	34	52340	SW of Stapleton and Tomahawk
32	65	13	06	53060	NW Corner of BFR and Woodmen
33	66	11	25	61250	Hodgen and Farrar Drive
34	66	11	26	61260	Hi Forest Ranch
35	66	11	35	61350	W of BFR (2-3mi) and S of Hodgen (1-2mi)
36	66	11	36	61360	W of BFR 1-2mi) and S of Hodgen (1-2mi)
37	66	12	01	62010	Cathedral Pines (W of Holmes)
38	66	12	02	62020	Cathedral Pines
39	66	12	03	62030	E of Rt 83; W of Cathedral Pines
40	66	12	10	62100	NE of Shoup and Rt 83
41	66	12	11	62110	N of Shoup; Peregrine
42	66	12	12	62120	NW of Shoup and Holmes
43	66	12	13	62130	SE of Shoup and Milam
44	66	12	14	62140	SE of Shoup and Howells
45	66	12	23	62230	SE of Burgess and Milam
46	66	12	24	62240	NE of Milam and Old Ranch

APPENDIX II

SECTION VALUE INDICES

In order to help properly establish priorities for risk remediation, some concept of section value is needed. The purpose of this appendix is to provide such guidance. As already noted in Section 3.4.1, one must realize at the outset that this is an attempt to think the unthinkable, and to value the invaluable – namely to say that if a wildfire were to destroy all the property within a section, how would one prioritize the loss of that against some other section. To its owner, the loss of one individual parcel can range from catastrophic to minor, depending upon factors such as insurance, whether or not there is a dwelling on the parcel, one's individual finances, etc. One also must work with some version of "official" as opposed to subjective data.

We have collected from the El Paso County Assessor's Office the data in the second through the fourth columns on the subsequent page (the first is just a reference number). The second column labeled "Section ID" is the section reference from column five of Appendix I, used by the county to identify sections. The next three columns are the number of parcels in each section (assumed for our purposes to represent the number of dwellings), total market value of each section as reported by the Assessor's office, and total assessed section value.

The Committee immediately realized that simply using total value as a single measure would be inappropriate, since the loss of one \$900,000 "mansion" should not count as equal to the loss of three \$300,000 dwellings. We therefore created columns identifying both the relative number of parcels and relative values for each section. To do this, we added up the total number of parcels and divided by the number of sections to calculate the average number of parcels per section within the BFFRPD area. Then we divided the number of parcels in each section by this average to obtain a "Parcel Factor" – a number indicating the density of parcels relative to the average. We also calculated a "Value Factor", using Market Values in a corresponding manner. (It may be of interest to point out that the total market value of properties within this area, according to the assessor's office, is over \$900 million dollars!) Note that if all sections were completely homogeneous – i. e. if every section had the same number of parcels with the same aggregate market value, then all these factors would be exactly one. The next column is the product of the two preceding columns, and represents our (admittedly somewhat subjective) attempt to calculate a single value combining the number of parcels with total market value. While we recognize that no approach is perfect, we have assigned priorities in the following table as 1, 2, or 3, with 1 being the highest. The fifteen sections with a value index of one all have a PF x VF score above 1.6. The fifteen sections ranked with a two all have a PF x VF score above 0.4. The remaining 16 had a score below 0.3. For the mathematically inclined:

$$PF(i) = 46 \times \text{No. Of Parcels (I)} / \text{Sum from 1 to 46 of No. of Parcels (I)}$$

$$VF(I) = 46 \times \text{Market Value (I)} / \text{Sum from 1 to 46 of Market Value (I)}$$

#	Parcel ID	No of Parcels	Market Value	Assessed Value	PF	VF	PF x VF	Val Indx
1	51280	114	\$31,601,729	\$2,728,600	1.43	1.60	2.27	1
2	51290	89	\$20,800,072	\$1,923,820	1.11	1.05	1.17	2
3	51300	1	\$12,990	\$3,770	0.01	0.00	0.00	3
4	51310	37	\$6,434,325	\$868,420	0.46	0.32	0.15	3
5	51320	61	\$16,794,444	\$1,438,490	0.76	0.85	0.65	2
6	51330	102	\$33,147,747	\$2,774,160	1.28	1.67	2.13	1
7	51340	102	\$32,962,618	\$2,864,180	1.28	1.66	2.12	1
8	52020	1	\$355,589	\$36,130	0.01	0.02	0.00	3
9	52030	48	\$15,805,526	\$1,488,820	0.60	0.80	0.48	2
10	52040	143	\$37,105,132	\$3,156,730	1.79	1.87	3.35	1
11	52050	93	\$26,221,087	\$2,160,480	1.16	1.32	1.54	2
12	52060	131	\$29,061,803	\$2,261,920	1.64	1.47	2.40	1
13	52070	107	\$24,810,110	\$2,150,320	1.34	1.25	1.68	1
14	52080	238	\$29,835,010	\$2,565,190	2.98	1.51	4.48	1
15	52090	109	\$24,276,291	\$2,133,510	1.36	1.23	1.67	1
16	52100	5	\$768,568	\$58,060	0.06	0.04	0.00	3
17	52110	32	\$7,771,154	\$770,410	0.40	0.39	0.16	3
18	52150	100	\$29,881,703	\$2,436,160	1.25	1.51	1.89	1
19	52150	85	\$22,158,446	\$1,988,170	1.06	1.12	1.19	2
20	52160	2	\$2,490,013	\$1,730	0.03	0.13	0.00	3
21	52170	105	\$22,403,232	\$1,844,570	1.31	1.13	1.49	2
22	52180	85	\$18,672,791	\$1,668,340	1.06	0.94	1.00	2
23	52190	88	\$22,587,864	\$2,389,970	1.10	1.14	1.25	2
24	52200	199	\$58,268,162	\$4,144,390	2.49	2.94	7.32	1
25	52210	77	\$18,914,946	\$1,657,950	0.96	0.96	0.92	2
26	52220	79	\$15,536,897	\$1,856,200	0.99	0.78	0.77	2
27	52270	43	\$9,489,899	\$838,320	0.54	0.48	0.26	3
28	52280	31	\$10,158,173	\$847,160	0.39	0.51	0.20	3
29	52290	250	\$41,468,421	\$4,277,720	3.13	2.09	6.54	1
30	52290	127	\$43,032,314	\$3,910,110	1.59	2.17	3.45	1
31	52320	27	\$7,037,594	\$1,096,260	0.34	0.36	0.12	3
32	52340	12	\$2,419,880	\$225,300	0.15	0.12	0.02	3
33	53060	201	\$9,879,587	\$1,543,520	2.51	0.50	1.25	2
34	61250	26	\$8,412,904	\$1,360,190	0.33	0.42	0.14	3
35	61260	175	\$80,154,499	\$9,156,490	2.19	4.05	8.86	1
36	61350	1	\$31,282	\$9,070	0.01	0.00	0.00	3
37	61360	1	\$22,348	\$6,480	0.01	0.00	0.00	3
38	62010	121	\$15,523,686	\$2,104,750	1.51	0.78	1.19	2
39	62020	43	\$4,084,014	\$1,036,070	0.54	0.21	0.11	3
40	62030	13	\$3,847,522	\$309,840	0.16	0.19	0.03	3
41	62100	27	\$15,713,510	\$1,631,790	0.34	0.79	0.27	3
42	62110	92	\$42,169,863	\$3,973,180	1.15	2.13	2.45	1
43	62120	65	\$17,613,995	\$1,583,140	0.81	0.89	0.72	2
44	62130	63	\$16,190,853	\$1,394,120	0.79	0.82	0.64	2
45	62230	79	\$21,993,349	\$2,138,640	0.99	1.11	1.10	2
46	62240	106	\$29,611,491	\$2,519,420	1.33	1.50	1.98	1
	SUM	3,622	\$895,931,704		45.28	45.25	67.15	
	AVG	80	\$19,909,593		1.01	1.01	1.49	

APPENDIX III

SECTION RISK INDICES

The companion analysis to Appendix II is an examination of the risk that each Section faces of Crown fire. This appendix represents our concept for the factors that contribute to this risk. We have not yet developed algorithms appropriate to summarize a) the basic (10) factors into the major (6) factors identified below, or b) the major factors into an overall conclusion (the column labeled “Index”) for each of the 46 Sections. The six major factors are listed left to right below in order of priority. The data in this Appendix is based on the raw data collected by volunteers and identified in Appendix IV.

[illegible]

APPENDIX IV

SECTION WILDFIRE HAZARD DATA COLLECTION FORM

Section assessment: Indoor

Range:____ Township:____ Section:____ Ref. No. _____

Date(s) assessed:_____ to _____

Data gathered by: _____

Fire break miles bordering or within this section: _____

Primary road miles bordering or within this section: _____

Water supply

Number of water sources within 3 miles: _____

Number of water sources within 5 miles: _____

Distance to nearest fire station: _____

What fire station is it? _____

Topography

Estimate from topographical map

% of section:

< 8% slope: _____

9-20% slope: _____

21-30% _____

> 30% _____

Vegetation

Estimate from satellite imagery **% of section:**

Grass with scattered trees or brush: _____

"Thinned" conifers (10 ft. or more between trees) _____

Dense, continuous conifers and/or thick brush _____

Evacuation route choices

In how many directions may people leave this section?

4 North, south, east, or west

3 Any three directions

2 Any two directions

1 One direction only

BFCWPP Land Section Assessment: Drive-through Survey Report

County Assessor's Land Section Prefix Number (5-digits on aerial photo): _____ (please enter on all pages)

Dates of Drive-through Survey: From: _____ to _____

Data gathered by Name: _____ Phone: _____ Name: _____ Phone: _____

Page ____ of ____

(names, phone numbers and dates needed on first page only)

[illegible]

APPENDIX V

FIREWISE GUIDELINES

TREE SPACING – RULE OF THUMB

Strive to reduce crown density to 40% or less.

Ponderosa Pine/Douglas Fir: Convert stem diameter from inches to feet and add 6 more feet.

Example: A Ponderosa Pine 8” dbh (diameter at breast height, about 4½ feet above the ground)(*diameter = circumference x 0.31831*) will have a spacing of 8 feet plus 6 feet for a total of 14 feet to the next tree.

The spacing does not need to be even. In fact the fuel treatment area will look more natural if the spacing varies and small clearings are intermingled with small stands of trees. The important focus should be on breaking up fuel continuity – horizontal and vertical.

When selecting trees for thinning, consider:

- **Quality** – trees’ health and vigor. Healthy trees have straight trunks, conical tops, and large amounts of green needles;
- **Tree Size** – strive for a mixture of sizes;
- **Spacing** – crowns should not touch, best 5’-10’ apart;
- **“Character” Trees** – unique in shape, historical, stand out, or hide undesirable views;
- **Mixed Species** – preserve mixed species, if you have them, to protect against losing everything to a single pest.

Begin nearest your house to protect it first. Create at least 30’ of defensible space (more on a slope) with no trees or widely-spaced trees, low (4”) ground cover, and fire-resistant shrubs. Then proceed to thin outward.

An important part of fuel hazard reduction is removal of the ladder fuels, particularly when adequate thinning cannot be accomplished. Therefore, the following is important to do within a timber canopy:

Prune trees up to 8 to 10 feet depending on slope. On trees less than thirty feet tall always leave at least two-thirds of the green branches
Remove under story reproduction
Remove sagebrush, oak or any other flammable brush
Remove all dead forest debris

Remove trees recently killed by mountain pine beetle or any other disturbance

Stage the thinning work over a long enough time to allow the standing trees to develop their wind firmness. Thinning when trees are small helps prevent this blow down vulnerability. Thinning in patches and designing the thinning to minimize wind effect can be done depending on location. All of these can best be accomplished with the assistance of an experienced forester.

Note: All slash disposal procedures should be implemented to avoid attracting mountain pine bark beetle to the project area.

For more information, visit these local websites:

Black Forest Fire/Rescue Local tips for preparing for wildfire. Download the brochure "Wildfire... Are You Prepared?"	http://www.bffire.org
Slash-Mulch to collect what you cut	http://www.bfslash.org
The FireWise web site A wealth of wildfire information, defensible space advice, and preparation tips.	http://www.firewise.org
Colorado State Forest Service – Protect Your Home and Forest section	http://csfs.colostate.edu/protecthomeandforest.htm
U.S. Forest Service: Rocky Mountain Area Coordination Center This page includes links to all information below:	http://gacc.nifc.gov/rmcc/
U.S. Drought Monitor	http://www.drought.unl.edu/dm/monitor.html
The Fire Weather and Intelligence Page Everything you ever wanted to know about wildfire potential and activity in the Rocky Mountain region.	http://www.blm.gov/colorado/rmafwx/index.html
Observed Fire Danger Class	http://www.fs.fed.us/land/wfas/fd_class.gif
Fire Weather Outlook Visual summary of weather conditions	http://www.fs.fed.us/r2/fire/rmafwx.png
Fire Weather Forecast Detailed text report of local fire weather is provided by the Pueblo Dispatch Center (Black Forest is Zone 226)	http://fire.boi.noaa.gov/firewx/denfwfpub.html

You can pick up Firewise information at the Black Forest Fire Department.

For a free Firewise Assessment from a uniformed Fire Department volunteer, e-mail firewise@bffire.org to set up an appointment.

APPENDIX VI

DEFINITIONS/GLOSSARY OF TERMS

Age Class – A classification of trees of a certain range of ages.

Aspect – The direction in which any piece of land faces.

Biological Diversity – The variety of living organisms considered at all levels of organization, including the genetic, species, and higher taxonomic levels, and the variety of habitats and ecosystems, as well as the processes occurring therein.

Bole – The main stem or trunk of a tree.

Canopy – The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand. Where significant height differences occur between trees within a stand, formation of a multiple canopy (multi-layered) condition can result.

Citizen Safety Zone – An area that can be used for protection by residents, and their vehicles, in the event that the main evacuation route is compromised. The area should be maintained, clear of fuels and large enough for all residents of the area to survive an advancing wildfire without special equipment or training.

Coarse Woody Material – Portion of tree that has fallen or been cut and left in the woods. Pieces are at least 16 inches in diameter (small end) and at least 16 feet long.

Cohort – A group of trees developing after a single disturbance, commonly consisting of trees of similar age, although it can include a considerable range of tree ages of seedling or sprout origin and trees that predate the disturbance.

Community Assessment – An analysis designed to identify factors that increase the potential and/or severity of undesirable fire outcomes in WUI communities.

Crown Class – A class of tree based on crown position relative to the crowns of adjacent trees.

Crown Fire – Fire that advances through the tops of the trees.

DBH – Diameter at breast height.

Defensible Fuel Reduction Zones – Areas of modified and reduced fuels that extend beyond fuel breaks to include a larger area of decreased fuels. These would include

managed stands with reduced amounts, continuities, and/or distributions of fuels that would provide additional zones of opportunity for controlling wildfire.

Defensible Space – An area around a structure where fuels and vegetation are modified, cleared or reduced to slow the spread of wildfire toward or from a structure. The design and distance of the defensible space is based on fuels, topography, and the design/materials used in the construction of the structure.

Density Management – Cutting of trees for a variety of purposes including, but not limited to: accelerating tree growth, improved forest health, to open the forest canopy, promotion of wildlife and/or to accelerate the attainment of old growth characteristics if maintenance or restoration of biological diversity is the objective.

Dominant – Crowns extend above the general level of crown cover of others of the same stratum and are not physically restricted from above, although possibly somewhat crowded by other trees on the sides.

Co-Dominant – Crowns form a general level of crown stratum and are not physically restricted from above, but are more or less crowded by other trees from the sides.

Down, Dead Woody Fuels – Dead twigs, branches, stems, and boles of trees and shrubs that have fallen and lie on or near the ground.

Extended Defensible Space – A defensible space area where treatment is continued beyond the minimum boundary. This zone focuses on forest management with fuels reduction being a secondary consideration.

Fire Behavior Potential – The expected severity of a wildland fire expressed as the rate of spread, the level of crown fire activity, and flame length. Derived from fire behavior modeling programs utilizing the following inputs: fuels, canopy cover, historical weather averages, elevation, slope and aspect.

Fire Hazard – The likelihood and severity of Fire Outcomes (Fire Effects) that result in damage to people, property, and/or the environment. Derived from the Community Assessment and the Fire Behavior Potential.

Fire Mitigation – Any action designed to decrease the likelihood of an ignition, reduce Fire Behavior Potential, or to protect property from the impact of undesirable Fire Outcomes.

Fire Outcomes (Fire Effects) – A description of the expected effects of a wildfire on people, property and/or environment based on the Fire Behavior Potential and physical presence of Values-At-Risk. Outcomes can be desirable as well as undesirable.

Fire Risk – The probability that an ignition will occur in an area with potential for damaging effects to people, property and/or the environment. Risk is based primarily on historical ignitions data.

Fuel Break – A natural or constructed discontinuity in a fuel profile utilized to isolate, stop or reduce the spread of fire. Fuel breaks may also make retardant lines more effective and serve as control lines for fire suppression actions. Fuel breaks in the WUI are designed to limit the spread and intensity of crown fire activity.

Hazard – The combination of the wildfire hazard ratings of the WUI communities and the fire behavior potential as modeled from the fuels, weather and topography of the study area.

Intermediate – Trees are shorter, but their crowns extend into the general level of dominant and co-dominant trees, free from physical restrictions from above, but quite crowded from the sides.

Risk – The likelihood of an ignition occurrence that results in a significant fire event.

Shelter-In-Place – A method of protecting the public from an advancing wildfire involving instructing people to remain inside their homes or public buildings until the danger passes. This concept is a dominant modality for public protection from wildfires in Australia where fast moving, short duration fires in light fuels make evacuation impractical. The success of this tactic depends on a detailed preplan that takes into account the construction type and materials of the building used, topography, depth and type of the fuel profile, as well as current and expected weather and fire behavior.

Suppressed – Also known as overtopped. Crowns are entirely below the general level of dominant and co-dominant trees and are physically restricted from immediately above.

Values-At-Risk – People, property and environmental features within the project area which are susceptible to damage from undesirable fire outcomes.

APPENDIX VII

SLASH TREATMENTS

Slash is the material left after any useable wood is removed from a forest restoration project. It usually consists of branches and tree tops that are too small in diameter to use, but may include larger diameters of wood. Proper clean up of slash is essential to reduce fire hazard, maintain aesthetic values and for forest health. Following is a brief list of the slash treatments most commonly available to landowners.

Lop and Scatter:

This treatment consists of using the chainsaw to cut the slash into small pieces so that the height of the remaining slash is 6 inches or less. It may be the only practical treatment in areas where chippers are unavailable or prohibitively expensive. It is usually the lowest cost treatment since no special equipment, other than a chainsaw, is needed.

The treated slash is left to decompose. Over the course of several winters, snow pack pushes the slash down and it becomes unnoticeable. This process usually requires three to five years. . It is the most aesthetically unappealing since the slash remains visible until it breaks down.

Lop and scatter should not be used in the defensible zones around structures since the woody material will burn in the event of a fire. The increased fire risk is most prevalent until the needles fall off the wood, but persists until the slash is on the ground and decomposing. In areas away from structures, the slight increase in ground fuel is still a great improvement over the risk of crown fires in an untreated stand. Often lopped and scattered slash is broadcast burned at a later date.

Lopped and scattered slash can also lead to problems with *ips* beetles. The beetles may lay eggs in green slash and the resultant brood may emerge to attack living trees. This problem can be alleviated by doing any forest restoration treatments requiring this method in the fall and winter when *ips* are not active and by cutting slash into small pieces that dry out quickly.

Chipping:

Chipping in this context refers to chipping the remaining slash after the trees have been cut and removed for a wood product. Masticating machines, on the other hand, usually chip whole trees as part of the harvest operation itself.

This method may be very labor intensive if the slash must be carried to the chipping machine by hand. As more labor is required to accomplish the task, the cost will rise. On difficult terrain, where slash must be hauled long distances to the chipper this may be a cost prohibitive method.

Chipping is the most common method of slash disposal in the defensible zones around structures. Chips do not significantly contribute to fire hazard around structures since they are close to the ground. They may smolder, but do not produce any significant flame. Large piles of chips should be avoided as they could smolder for a significant amount of time. Chips should be spread along the ground to a depth of less than four inches.

Chipping is an effective means of treating wood infested with bark beetles since the insects will not survive in the small bits of wood. Green slash that is promptly chipped will not harbor infestations of *ips* or other bark beetles.

Chippers are available from many equipment rental businesses, although the rental tends to be expensive and the homeowner must have a vehicle capable of towing a machine. Many communities own chippers and will make them available to landowners doing defensible space projects. Local fire protection districts usually have this information.

Pile and Burn:

Any form of open burning requires a permit, and burning must be done only under the conditions stipulated in the permit. The permitting process varies from county to county. Local fire departments will be able to tell a landowner how to obtain a permit.

For most landowners the slash is piled by hand and burned when conditions are safe—usually a certain amount of snow on the ground. Piles burn best when they are compact and the height is greater than the diameter. This arrangement promotes hotter burning and less smoke.

Location of burn piles is important as well. Piles should be located as far away from standing trees as possible. Even when burning in the winter it is possible to scorch living trees from the heat of the burning pile. Avoid making burn piles on top of stumps. The fire could smolder long distances through the roots of the stump.

The green branches and wood placed in piles will be left in branch lengths long enough to dry out. As a result, piles carry the risk of harboring broods of *ips* beetles which may emerge to attack living trees. On the other hand, burning is an ideal method of killing any bark beetles infesting the wood.

Often piles from wood cut one winter must sit through the following summer in order to dry, or piles from one season may be left over the next summer if proper burning conditions were not available during the winter. In each case the dry wood piles will sit through a burning season with the risk of ignition.

The fire should be monitored during the day and for several days thereafter. The center of a pile usually burns completely, but often wood around the edges does not. To ensure that the slash at the edge of each pile burns it is necessary to “chunk in” the piles

periodically. This means that as the fire at the middle of the pile burns down, wood from the edges should be thrown into the center to insure complete burning of all slash.

For several years after a pile is burnt, an unsightly black ring remains where the heat of the fire scorched the soil. Many landowners find these unpleasant to look at. They may also present an opportunity for noxious weed to colonize the bare soil. Breaking up the bare soil with a rake and reseeding with native plants is recommended.

Broadcast Burning:

This method is more often used by government agencies with extremely large tracts of land than by private landowners. No landowner should attempt a broadcast burn without consulting an individual with expertise in planning and executing broadcast burns.

The permitting procedure for a broadcast burn is quite complex. Smoke management is often the most difficult part of the process. Smoke from a fire must be carefully controlled to minimize annoyance to the public. Broadcast burns must be done under carefully prescribed weather conditions. Burns can be delayed for years if the proper conditions do not occur. Depending on the circumstances, broadcast burns may require large numbers of personnel to hold the fire. Often, such burns are done with the assistance of local fire protection districts as training exercises.

Once the difficulties are overcome, however, broadcast burning may be the best method of accomplishing forest restoration as well as slash treatment. Light fire on the ground is nature's way of maintaining ponderosa pine or mixed ponderosa and Douglas-fir forests. It should be noted that lodgepole pine types and spruce/fir types are adapted to a fire regime of infrequent, stand replacement fires, and broadcast burning may not be suitable in these types.

Unlike chipping or lop and scatter methods which still leave fuel, albeit in a modified condition, burning consumes the slash. Once burned, there is no longer any fuel to feed a wildfire. Broadcast burning, unlike other methods leaves a seed bed ideal for regeneration of new trees.

On the other hand, broadcast burning, by removing the existing ground vegetation may also encourage invasion of noxious weeds. Burned areas should be carefully monitored after burning. Usually the heat produced by broadcast burning does not damage the soil and reseeding is not necessary. Green slash left to cure over the warm season may also be a brood site for *ips* beetles.

APPENDIX E
Colorado State University Extension Fire-Resistant Landscaping

Fire-Resistant Landscaping

Fact Sheet No. 6.303

Natural Resources Series|Forestry

by F.C. Dennis*

Colorado's population is growing, its urban areas are rapidly expanding, and people are building more homes in what was once natural forest and brushlands. Newcomers to rural areas need to know how to correctly landscape their property to reduce wildfire hazards.

Improper landscaping worries land managers and fire officials because it can greatly increase the risk of structure and property damage from wildfire. It is a question of *when*, not *if*, a wildfire will strike any particular area.

Vegetative clearance around the house (defensible space) is a primary determinant of a home's ability to survive wildfire. Defensible space is, simply, room for firefighters to do their job. If grasses, brush, trees and other common forest fuels are removed, reduced, or modified to lessen a fire's intensity and keep it away from the home, chances increase that the structure will survive. It is a little-known fact that in the absence of a defensible space, firefighters will often bypass a house, choosing to make their stand at a home where their safety is more assured and the chance to successfully protect the structure is greater.

Landscaping Defensible Space

People often resist creating defensible space because they believe that it will be unattractive, unnatural and sterile-looking. It doesn't have to be! Wise landowners carefully plan landscaping within the defensible space. This effort yields a many-fold return of beauty, enjoyment and added property value. Development of defensible space is outlined in fact sheet 6.302, *Creating Wildfire-Defensible Zones*.

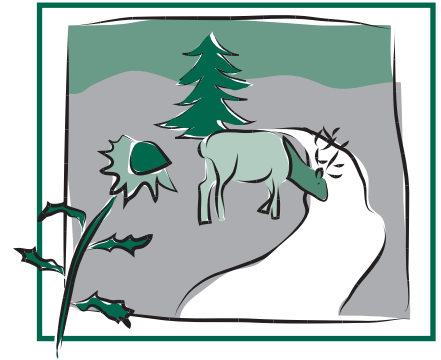
Colorado has great diversity in climate, geology and vegetation. Home and cabin sites can be found from the foothills through

10,000-foot elevations. Such extremes present a challenge in recommending plants. While native plant materials generally are best, a wide range of species can be grown successfully in Colorado.

Many plant species are suitable for landscaping in defensible space. Use restraint and common sense, and pay attention to plant arrangement and maintenance. It has often been said that *how* and *where* you plant are more important than *what* you plant. While this is indeed true, given a choice among plants, choose those that are more resistant to wildfire.

Consider the following factors when planning, designing and planting the FireWise landscape within your home's defensible space:

- Landscape according to the recommended defensible-space zones. That is, the plants near your home should be more widely spaced and lower growing than those farther away.
- Do not plant in large masses. Instead, plant in small, irregular clusters or islands.
- Use decorative rock, gravel and stepping stone pathways to break up the continuity of the vegetation and fuels. This can modify fire behavior and slow the spread of fire across your property. It is highly recommended that the first 3-5 feet away from the house be gravel, flagstone, pavers, or some other non-flammable material.
- Incorporate a diversity of plant types and species in your landscape. Not only will this be visually satisfying, but it should help keep pests and diseases from causing problems within the whole landscape.
- In the event of drought and water rationing, prioritize plants to be saved. Provide available supplemental water to plants closest to your house.
- Use mulches to conserve moisture and reduce weed growth. To reduce fire danger, it is best to use a non-organic mulch such as pea gravel or stone, but leaf



Quick Facts

- More people are moving into Colorado's rural areas, increasing the chances of wildfire.
- "Defensible space" is the primary determinant of a structure's ability to survive wildfire.
- Native species are generally the best plant materials for landscaping in defensible space, but others can be grown successfully in Colorado.
- To be a FireWise homeowner, plan well, plant well and maintain well.

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The best tree species to plant generally are those naturally occurring on or near the site.

Mow grass short around shrubs.

Plant low-growing, nonresinous shrubs near structures.

Keep grass mown around structures to a maximum of 8 inches.

Plant wildflowers near structures only if they are well-irrigated and cut back during the dormant season.

Gravel area or mow grass short next to the structure.

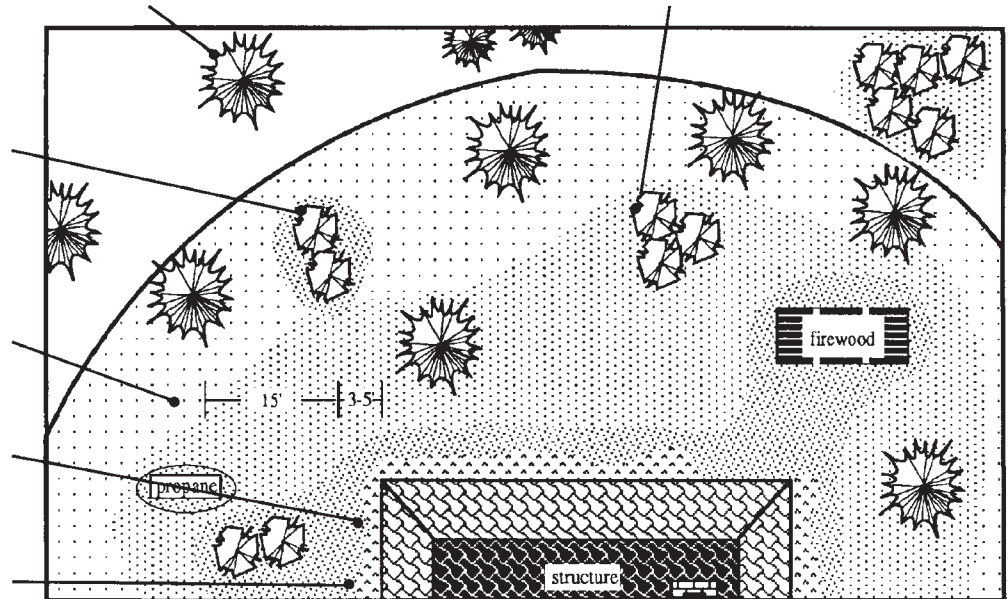


Figure 1: Forested property surrounding a homesite shows optimum placement of vegetation near the structure.

mold or compost is also acceptable. Do not use pine bark, thick layers of pine needles or other mulches that readily carry fire.

- Be creative! Further vary your landscape by including bulbs, garden art and containers for added color.

Grasses

During much of the year, grasses ignite easily and burn rapidly. Tall grass will quickly carry fire to your house. Mow grasses low in the inner zones of the defensible space. Keep them short closest to the house and gradually increase height outward from the house, to a maximum of 8 inches. This is particularly important during fall, winter and before green-up in early spring, when grasses are dry, dormant and in a “cured” fuel condition. Given Colorado’s extremely variable weather, wildfires can occur any time of the year. Maintenance of the grassy areas around your home is critical.

Mow grasses low around the garage, outbuildings, decks, firewood piles, propane tanks, shrubs, and specimen trees with low-growing branches.

Ground Cover Plants

Replace bare, weedy or unsightly patches near your home with ground covers, rock gardens, vegetable gardens and mulches. Ground cover plants are a good alternative to grass for parts of your defensible space. They break up the monotony of grass and enhance the beauty of your landscape. They provide a variety of textures and color and help reduce soil erosion. Consider ground cover plants for areas where access for mowing or other maintenance is difficult, on steep slopes and on hot, dry exposures.

Ground cover plants are usually low growing. They are succulent or have other FireWise characteristics that make them useful, functional and attractive. When planted in beds surrounded by walkways and paths, in raised beds or as part of a rock garden, they become an effective barrier to fire spread. The ideal groundcover plant is one which will spread, forming a dense mat of roots and foliage that reduces soil erosion and excludes weeds.

Mulch helps control erosion, conserve moisture and reduce weed growth. It can be organic (compost or leaf mold) but inorganic mulch is preferred (gravel, rock, decomposed granite). Mulches that carry such as bark chips, straw, pine needles or other flammable material should not be

used, as that can carry fire to the structure. When using organic mulches, use just enough to reduce weed and grass growth. Avoid thick layers. When exposed to fire, they tend to smolder and are difficult to extinguish.

Wildflowers

Wildflowers bring variety to a landscape and provide color from May until frost. Wildflower beds give a softer, more natural appearance to the otherwise manicured look often resulting from defensible space development.

A concern with wildflowers is the tall, dense areas of available fuel they can form, especially in dormancy. To reduce fire hazard, plant wildflowers in widely separated beds within the defensible space. Do not plant them next to structures unless the beds are frequently watered and weeded and vegetation is promptly removed after the first hard frost. Use gravel walkways, rock retaining walls or irrigated grass areas mowed to a low height to isolate wildflower beds from each other and from other fuels.

Shrubs

Shrubs lend color and variety to the landscape and provide cover and food for wildlife. However, shrubs concern fire

Structural Elements of a FireWise Landscape

When building a deck or patio, use concrete, flagstone or rock instead of wood. These materials do not burn and do not collect flammable debris like the space between planks in wooden decking.

Where appropriate on steeper ground, use retaining walls to reduce the steepness of the slope. This, in turn, reduces the rate of fire spread. Retaining walls also act as physical barriers to fire spread and help deflect heat from the fire upwards and away from structures.

Rock or masonry walls are best, but even wooden tie walls constructed of heavy timbers will work. Put out any fires burning on tie walls after the main fire front passes.

On steep slopes, consider building steps and walkways around structures. This makes access easier for home maintenance and enjoyment. It also serves as a physical barrier to fire spread and increases firefighters' speed and safety as they work to defend your home.

professionals because, as the next level in the "fuel continuum," they can add significantly to total fuel loading. Because of the woody material in their stems and branches, they are a potential source of fire brands. When carried in the smoke column ahead of the main fire, fire brands can rapidly spread the fire in a phenomenon known as "spotting."

But the primary concern with shrubs is that they are a "ladder fuel" – they can carry a relatively easy-to-control surface grass fire into tree crowns. Crown fires are difficult, sometimes impossible, to control (see Figure 2).

To reduce the fire-spreading potential of shrubs, plant only widely separated,

low-growing, nonresinous varieties close to structures. Do not plant them directly beneath windows or vents or where they might spread under wooden decks. Do not plant shrubs under tree crowns or use them to screen propane tanks, firewood piles or other flammable materials. Plant shrubs individually, as specimens, or in small clumps apart from each other and away from any trees within the defensible space.

Mow grasses low around shrubs. Prune dead stems from shrubs annually. Remove the lower branches and suckers from species such as Gambel oak to raise the canopy away from possible surface fires.

Trees

Trees provide a large amount of available fuel for a fire and can be a significant source of fire brands if they do burn. Radiant heat from burning trees can ignite nearby shrubs, trees and structures.

Colorado's elevation and temperature extremes limit tree selection. The best species to plant generally are those already growing on or near the site. Others may be planted with careful selection and common sense.

If your site receives enough moisture to grow them, plant deciduous trees such as aspen or narrow-leaf cottonwood. These species, even when planted in dense clumps, generally do not burn well, if at all. The greatest problem with these trees is the accumulation of dead leaves in the fall. Remove accumulations close to structures as soon as possible after leaf drop.

When site or available moisture limits recommended species to evergreens, carefully plan their placement. Do not plant trees near structures. Leave plenty of room between trees to allow for their growth. Spacing within the defensible space should be at least 10 feet between the edges of tree crowns. On steep ground, allow even more space between crowns. Plant smaller

trees initially on a 20- to 25-foot spacing to allow for tree growth. At some point, you will have to thin your trees to retain proper spacing.

As the trees grow, prune branches to a height of 10 feet above the ground. Do not overprune the crowns. A good rule of thumb is to remove no more than one-third of the live crown of the tree when pruning. Prune existing trees as well as ones you planted.

Some trees (for example, Colorado blue spruce) tend to keep a full crown. Other trees grown in the open may also exhibit a full growth habit. Limit the number of trees of this type within the defensible space. Prune others as described above and mow grasses around such specimen trees.

Maintenance

A landscape is a dynamic system that constantly grows and changes. Plants considered fire resistant and that have low fuel volumes can lose these characteristics over time. Your landscape, and the plants in it, must be maintained to retain their FireWise properties.

- ☐ Always keep a watchful eye towards reducing the fuel volumes available to fire. Be aware of the growth habits of the plants within your landscape and of the changes that occur throughout the seasons.
- ☐ Remove annuals and perennials after they have gone to seed or when the stems become overly dry.
- ☐ Rake up leaves and other litter as it builds up through the season.
- ☐ Mow or trim grasses to a low height within your defensible space. This is particularly important as grasses cure.
- ☐ Remove plant parts damaged by snow, wind, frost or other agents.
- ☐ Timely pruning is critical. Pruning not only reduces fuel volumes but also maintains healthier plants by producing more vigorous, succulent growth.



Figure 2: Ladder fuels enable fire to travel from the ground surface into shrubs and then into the tree canopy.

- Landscape maintenance is a critical part of your home's defense system. Even the best defensible space can be compromised through lack of maintenance. The old adage "An ounce of prevention is worth a pound of cure" applies here.

References

- 6.302, *Creating WildFire-Defensible Zones*
- 6.304, *Forest Home Fire Safety*
- 6.305, *FireWise Plant Materials*
- 7.233, *Wildflowers for Colorado*
- 7.406, *Flowers for Mountain Communities*
- 7.413, *Ground Covers for Mountain Communities*
- 7.423, *Trees and Shrubs for Mountain Areas*



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



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