

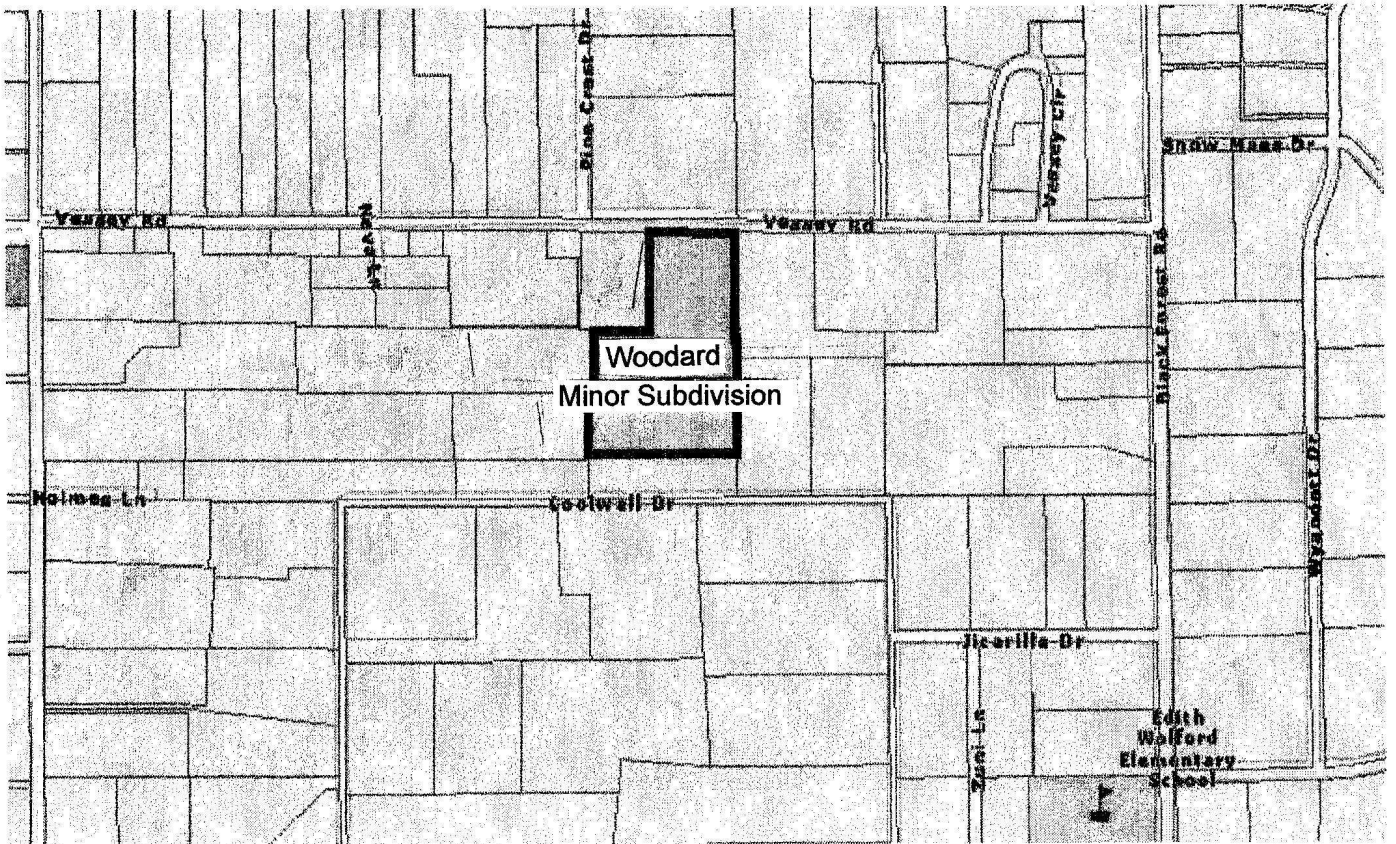
**WILDFIRE HAZARD ASSESSMENT
AND MITIGATION REPORT
for the proposed
WOODARD MINOR SUBDIVISION
El Paso County, Colorado.**

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Woodard Minor Subdivision is a proposed two lot subdivision of 14.2 acres located in Section 06, T12S, R65W of the 6th P.M., El Paso County. More generally, the property lies in the northern part of the County, about 3 miles east of Highway 83 and just west of Black Forest Road along the south side of Vessey Road. The County small area plan that applies to this parcel is the Black Forest Preservation Plan. The property lies in Plan Unit 1, The Timbered Area. This property was burned during the Black Forest Fire and the Woodard home was destroyed along with almost all of the timber. The parcel schedule number is 52060-00-065.



HAZARD ASSESSMENT

The El Paso County Wildfire Hazard Map (December 2007) has two hazard classifications: Low Hazard - Non Forested, (no vegetation, grass and brush) and High Hazard - Forested, (deciduous and conifer/evergreen). These hazards are based on the Colorado Vegetation Classification Project. The property in question is shown as having a High Hazard.

The earlier Wildfire Hazard Area Map (WHAM) developed by the Colorado State Forest Service in 1974 indicates the property to have a High Hazard for Trees.

WHAM mapping is somewhat dated (though still relevant) and has essentially been superseded by the 2012 Colorado Wildfire Risk Assessment (CO-WRAP) which can be found online at www.coloradowildfirerisk.com. This site discusses, analyzes and maps the several significant factors relative to wildfire behavior. It is user friendly and can be accessed by anyone at anytime.

Using the CO-WRAP mapping function for Fire Occurrence on this site we discover the likelihood of a wildfire starting based on historical ignition patterns is very low; rating a 1 out of 7 (highest). Looking to the Vegetation Map we find the general vegetation types are shown as grasses and a small area of conifers. One of the important characteristics of wildfire to determine when analyzing it's potential impact to structures is Fire Intensity. The Fire Intensity Map indicates a Low fire intensity for the property. Flame lengths of 4 to 8 feet are to be expected. Overall the mapped wildfire hazard is low. How do we understand these results given the earlier high County Map hazard or the previous WHAM rating of High? Those high ratings occurred before the Black Forest fire which essentially cleared this area of vegetation.

Although the hazard on this parcel is low, wildfire can occur and the opportunity for ignition remains. Vegetation will regrow and indeed, folks have replanted many trees throughout the burned area. The opportunity exists now to plant in areas that will respect future building sites, immediately creating areas of Defensible Space.

WILDFIRE BEHAVIOR

There are three primary components that affect wildfire behavior. The first is fuel, the second is topography and the third is the local weather during a wildfire event.

Fuels:

Except for the remaining standing dead timber, grasses are the primary fuel and grazing or mowing keeps them short. Grasses are an easily ignited fuel and, being light, they burn readily and rapidly. If ungrazed and unmowed, these grasses can grow 12 or 18 inches in height and support flame lengths of over 4 feet. Wildfire in grasslands can move faster than most people can run and can move even more quickly when conditions are windy. There remains a small stand of live ponderosa pine in the center of the property. The standing dead timber scattered throughout is to be removed.

Topography:

Assuming wind is not a factor, wildfire will advance faster up a slope than it will downslope or on level ground. This occurs primarily because the fire preheats and dries the fuel in front of itself when ascending a slope. The steeper the slope the more dramatic the effect. Generally slopes of greater than 25% are considered a significant hazard depending on fuel availability.

Slopes on the property are generally mild, typically in the 5% to 10% range. This slope is not likely to significantly influence wildfire behavior.

Weather:

It is a fact that the recent really large wildfires in Colorado have all had a weather component that drives them such that efforts to contain the blaze are severely hampered or even ineffectual. Wind and moisture are the two 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; that is, a prolonged drought (not uncommon here) lowers the moisture content of all 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. It will 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 start new fires up to a mile or more away. Additionally, extreme fire behavior will create it's own winds. These winds sometimes appear within the fire as small tornados. Tornados made of fire.

Another word about weather that is pertinent is the fact that there is only one fire season here along the front range. It lasts 12 months a year. Wildfires start, grow and damage property in every month of the year here. While it is true that we cannot do anything about the weather, we can be mindful of it's effects and potential impact on fire behavior all year long.

Which brings us to the subject of Mitigation. Since we know wildfires will occur but we cannot know when or how intense they may become, we must be proactive in creating an environment through which wildfire can pass with minimal impact to our structures and the land.

WILDFIRE MITIGATION

We cannot control the weather during a wildfire and we cannot alter the basic topography of the property during one either. That leaves two approaches that we can address before a wildfire happens. The first is to alter the fuels available to a wildfire and the second is to use fire resistant construction methods when we construct homes and outbuildings within the area.

Fuel Mitigation

It stands to reason that the less fuel available, the lower the impact any fire will have. Trees, brush and grasses can be reduced in number and trimmed such that fire will have a more difficult time moving from tree to tree or from the ground into the tree canopy. Canopy fires are especially difficult to control and typically lead to spotting which advances the fire rapidly and spreads firebrands into new areas that may be behind the efforts of firefighters who are battling the existing fire front. They can also impact structures directly, piling up against foundation walls like leaves in autumn or snow in winter. They also settle into valleys on roof tops, concentrating heat and fire there.

The mitigation of fuels is simply the managing of the continuity of fuel both horizontally and vertically within the landscape. Around homes and other structures, we identify a circular area within which we mitigate more intensely close to the structure and less intensely further out. This is called Defensible Space and it serves to reduce the fire hazard and to provide firefighters room to more safely fight a fire. Typically within 30 feet of a structure fuels are heavily reduced or even eliminated (think xeriscape landscape treatments adjacent to the house). Trees within this zone are few and far between. Ground cover is kept to 6 inches in height or less and pine needles or slash and debris are removed. This is Zone 1. In the next 50 to 100 feet fuel continuity is maintained at a lower density with at least 10 feet between tree limbs. Shrubs (especially scrub oak) in this zone are removed from under trees to prevent fire from "laddering up" into the canopy. Clumps of shrubs should be isolated and kept twice their mature height from other vegetation. Grasses are kept mowed. This is Zone 2. Finally Zone 3 is the area outside that 100 foot Zone 2 line. Here the forest is managed to maintain the health of the vegetation that is present. In this area of Colorado that often means some thinning. Trees in all zones are pruned 6 feet up from the forest floor to lessen the chance of fire reaching the crown. Mowing in Zone 3 is not necessary but collection and disposal of slash is a benefit. Colorado State Forest Service Quick Guide Fire 2012-1 (Formerly CSU Extension Fact Sheet 6.302) *Protecting Your Home from Wildfire: Creating Wildfire Defensible Zones* provides further discussion on defensible space and how to create and maintain it.

It is unusual to see a mature natural evergreen forest today in much of Colorado because past fire suppression efforts have allowed vegetative growth that is several times more dense than nature would permit. A mature natural forest has a park like appearance with trees of all ages, sizes and species, each having room to grow. Sunlight reaches almost all of the forest floor for at least some time during the day.

In light of the fact that this property is mostly grasses and no longer forested, we can expect homeowners will plant trees and shrubs. There can be a distinct advantage to this as species and type of vegetation can be placed where they will do the most good and still comply with the principals of Defensible Space. See CSFS / CSU Cooperative Extension pamphlet #6.306 *Grass Seed Mixes to Reduce Wildfire Hazard* and #6.305, *FireWise Plant Materials*, both by F.C. Dennis.

Fire Resistive Structure Construction

Wildfire is capricious. It is certainly possible to lose a structure that is constructed of all fire resistant materials. It is also much less likely than the loss of one constructed of light flammable materials like wood siding or roofing. Structures are ignited by the direct impingement of flames as a fire passes the structure and they are ignited by firebrands that are blown up against the walls or onto roof valleys or eaves. As we already know, structures will be preheated and dried by the approaching fire. Soffit and foundation vents must be screened to prevent embers from entering. Fire resistive roofing is absolutely necessary because of those firebrands. Windows are particularly vulnerable. Glass will fracture in about 10 minutes in the presence of the level of heat that wildfires generate. And that heat will get to the structure before the fire does. Glass that falls out or is blown in creates a direct path for firebrands to enter the home. Decks are particularly vulnerable to wildfire as they are often constructed (and decked) with light wood framing, open to fire below. Too, they are often placed above an approaching slope to enhance the view. The area under a deck should be rock or other non combustible material and a fire resistive soffit material should cover the bottom side while a non combustible surface should be used instead of light wood decking on top.

New construction can be planned to utilize materials that are fire resistive at little additional cost. Materials that are dangerously combustible can simply be avoided. There are several publications available that address materials and construction in the Wildland-Urban Interface. *FireWise Construction: Site Design & Building Materials* by Tim Foley and David Bueche, December 2012, based on the 2009 International Wildland-Urban Interface Code is published by the Colorado State Forest Service. The Federal Emergency Management Agency (FEMA) published P-737, *Home Builder's Guide to Construction in Wildfire Zones* in September 2008 as part of their Technical Fact Sheet Series. It addresses both existing structures and new construction and provides guidance for methods and techniques to employ for each.

Finally, effective and no longer prohibitively expensive automatic sprinkler systems are available and easily incorporated in new construction.

Like Defensible Space, the materials used in the construction of any structure are important but it is the execution of an overall plan of Defensible Space and fire resistive construction that will provide the best chance to reduce structural vulnerability to wildfire.

Black Forest Fire Rescue Protection District

The subject property lies within and is served by the Black Forest Fire Rescue Protection District. The Department is managed by a career fire chief, assistant fire chief and an administrative assistant. The department has nine career firefighter/EMT's, 14 part time firefighter/EMT's and 36 volunteer firefighter/EMT's. The department provides fire, rescue and emergency medical services along with public education and covers an area of approximately 48 square miles. The District serves about 10,000 residents through two stations. At least 3 firefighters are on call 24 hours a day.

Station #1 is located at 11445 Teachout Road. Equipment here includes a Type 1 Engine, two Brush Trucks, a Type 3 interface truck, two water trucks and two ambulances. The Station is staffed 24/7.

Station #2 is located at 16465 Ridge Run Road. This station houses an engine, a tender or water hauler which can function as a reserve Type 1 Engine, an ambulance and a brush truck. The station is staffed with part time personnel from 8 a.m. to 8 p.m. daily.

Both stations are within approximately 3 miles of the property. Response time average is within 8 minutes throughout the district.

Water is available on the responding trucks. There are a few cisterns throughout the district and stock ponds on some drainages. While often intermittent, these may be a nearby water source especially for aerial firefighting equipment.

Included with this Report is the full detailed *Colorado Wildfire Risk Assessment Report* created using the COWRAP Program.

Note: All Colorado State Forest Service publications are available on their website, www.csfs.colostate.edu