

Community Wildfire Protection Plan Eastern Arapahoe County

December 2012

Plan Approval

Arapahoe County approves the Community Protection Plan

Arapahoe County Commissioners, Chairman
Date

6-18-13

Arapahoe County Sheriff
Date

6-24-13

Bennett Fire Chief
Date

6-18-13

Sable Altura Fire Chief
Date

6/18/13

Strasburg Fire Chief
Date

6-19-13

Byers Fire Chief
Date

6/24/13

Deer Trail Fire Chief
Date

6/19/13

Cunningham Fire Chief
Date

7-3-13

Franktown District, Colorado State of Colorado Forest Service
Date

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Community Wildfire Protection Plan

Eastern Arapahoe County

December 2012

Overview

Community Wildfire Protection Plans (CWPP) are authorized and defined in Title I of the *Healthy Forests Restoration Act (HFRA)* passed by Congress on November 21, 2003 and signed into law by President Bush on December 3, 2003.

HFRA places renewed emphasis on community planning by extending a variety of benefits to communities with a wildfire protection plan in place. Critical among these benefits are: 1) The option to establish localized definitions and boundaries for areas having high Risk (potential), Hazards (fuels) and Values; and 2), The opportunity to help shape management priorities for federal and non-federal lands within the planning area.

The CWPP, as described in the Act, brings together diverse local interests to discuss their mutual concerns for public safety, community sustainability and natural resources. It offers a positive, solution-oriented environment in which to address challenges such as local firefighting capacity, the need for defensible space around homes (and areas of value), and where and how to prioritize land management.¹ (Colorado State Forest Service, 2005. Community Wildfire Protection Plans: Guidelines for Implementation.)

In 2009, the Colorado General Assembly passed SB 09-001 requiring counties to complete a CWPP for identified fire hazard areas within the unincorporated areas of the county. The CWPP must meet the minimum standards set forth by the State Forester.

The purpose of this document is to provide stakeholders and those living in eastern Arapahoe County with an overview of the wildland fire risks, hazards and values within the planning area, recommend possible courses of action to reduce the impacts of wildfire in the planned area, and to develop an implementation plan. The CWPP is not intended to identify parcel level specifics nor does it identify individual community fuels treatment priorities. These items are to be evaluated and included in a local-level CWPP.

Background

Partners and stakeholders in the Eastern Arapahoe County Community Wildfire Protection Plan are Arapahoe County Sheriff's Office, Sable Altura Fire Department, Bennett Fire Rescue, Strasburg Fire Rescue, Byers Fire Department, Deer Trail Fire Department, Cunningham Fire Protection District, Colorado State Forest Service Franktown District, property owners and residents of Eastern Arapahoe County.

Participants/Process

Participants since the onset through direct meeting participation are the Arapahoe County Sheriff Office (OEM), representatives from Buckley Air Force Base Fire Department, Cunningham Fire Protection District, Sable Altura Fire Protection District, Bennett Fire Protection District, Strasburg Fire Protection District, Byers Fire Protection District and Deer Trail Fire Protection District. These same individuals also represent their communities. Local private community organizations invited or that have participated are Antelope Hills HOA, Dove Hill HOA, Strasburg Heights HOA and Thunderbird Estates HOA. State partners notified or that have participated over time include the Colorado State Land Board, Colorado Department of Transportation, Colorado Division of Wildlife and Colorado State Forest Service. Assisting with the maps was the Arapahoe County Mapping Section. All of the participants are considered members of the Core Team.

Three Core Team meetings were held July-September 2011 at the Strasburg Fire Station to review maps of the county, determine hazard areas, review the components of the CWPP and provide input to various areas of the plan. Agendas from the meetings are shown in Appendix A.

Plan Components

A. Wildland Urban Interface (WUI)

According to HFRA, the wildland urban interface (WUI) is considered “any area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a Community Wildfire Protection Plan.” Communities have the ability to establish the definition and boundary of a localized WUI. Community-established WUI boundaries can help meet local management needs, can include both public and private land, and can help improve access to funding sources.

For the purposes of this CWPP the WUI boundary is drawn around those areas within unincorporated portions of Arapahoe County where hazard conditions exist and comprises 213,760 acres (334 square miles). The WUI boundary did not include the western portion of the County due to the urbanized environment where there was not a significant source of vegetation to carry fire. There are 44 communities within the WUI boundary and they are listed in Appendix B. The WUI boundary is show in Figure 1: Arapahoe County CWPP Wildfire Hazard Map. Adjacent counties are Douglas to the south, Jefferson County to the West, Adams County to the north, and Lincoln County to the east.

Land ownership within the CWPP planning area includes private and county (parks and open space) land. There are seven county parks/open space including: Arapahoe County Fairgrounds (236 acres), Bijou Basin Open Space (2,808 acres), Kiowa Creek North Open Space (265 acres), Kiowa Creek South Open Space (497 acres), Middle Bijou Creek Conservation Easement (12,578 acres), Richmil Ranch Open Space (352 acres), and West Bijou Conservation Easement (1,363 acres). County-owned lands are shown in Figure 1: Arapahoe County CWPP Wildfire Hazard Map.

Arapahoe County's highest concern area is the eastern part of the County east of Gun Club Road including communities and all development near the communities including but not limited to the Old Lowry Bombing Range, Colorado Interstate Gas Latigo storage field, Union Pacific Rail Road, Arapahoe County Open Space, Excel High Tension Power lines, High Plains Raceway.

The major communities are Strasburg (population 1,676), Bennett (population 2,647), Byers (population 1,362), Deer Trail (population 587), and unincorporated Arapahoe County. Due to the rural nature of the area there are scattered homes on parcels over 35 acres.

General – The eastern part of the County is rural with population centers around the communities. Major state highways cross the county E-W (Interstate 70, U.S. Highway 36 and U.S. Highway 40). The Union Pacific (UP) Railroad also comes into the county at the west edge and runs parallel to Interstate 70, it's exit point at the east end of the county. Several Petroleum lines intersect the county to include an interstate high pressure gas line runs somewhat diagonally through the county. The CIG plant has a significant station within the county. Creeks are East, West and Middle Bijou; Coal; Box Elder; West Sand Creek; Kiowa; Wolf; Comanche; Rattlesnake; and Muddy.

Eastern Arapahoe County has multiple high pressure gas and gas by-product underground lines located throughout the jurisdiction. The companies are:

Colorado Interstate Gas

ConocoPhillips Pipeline – Colorado

NuStar Logistics

DCP Midstream

Rocky Mountain Pipeline System, LLC

B. Preparedness to Respond to Wildland Fire

Cunningham, Sable Altura, Bennett, Strasburg, Byers and Deer Trail Fire Protection Districts serve and protect approximately 10,000 residents and approximately 648 square miles within the county. The county utilizes a central dispatch center with Enhanced 911 services (E-911).

All fire districts have signed a mutual aid agreement with all involved districts.

Arapahoe County has a signed Agreement for Cooperative Wildfire Protection with the Colorado State Forest Service and has an Annual Fire Operating Plan (AOP)

Arapahoe County has a Fire Ban Ordinance

Arapahoe County can initiate fire bans as appropriate. Incorporated communities have agreed to be a part of the overall county fire ban placement and rescission process.

Cunningham Fire Protection District currently operates one Type 6 engine. The department would like to get all line personnel trained to NWCG standards and be red card certified.

Sable Altura Fire Rescue currently operates one type 6 and one type 3 engines. Sable Altura would like to equip their personnel with proper wildland personal protection equipment and acquire portable pump packs.

Bennett Fire Rescue currently operates two Type 6 and one Type 3 engines. They also operate two tenders that contain 2500 and 3500 gallons of water. They would like to upgrade one of their Type 6 engines and would like to get staff trained to NWCG standards. Bennett also would like to see more water sites in Arapahoe County including cisterns strategically located to help with response times for tenders.

Strasburg Fire Protection District currently operates two Type 6 and one Type 3 engines. The department would like to get wildland personal protection gear for 24 staff and an additional Type 3 engine. They also would like to upgrade one of their Type 6 engines that is outdated.

Byers Fire currently operates two Type 6 and one Type 3 engines. They also operate a Type 2 that has pump and roll capabilities. Byers would like to get personnel trained to NWCG standards.

Deer Trail Rural Fire Protection District currently operates one Type 6 and one Type 3 engine. They also operate one tender that can hold 3500 gallons of water. Deer Trail is in the process of upgrading their tender and Type 3 engine. Deer Trail would also like to provide more wildland training for their personnel.

Arapahoe County Sheriff's Office currently operates two Type 7 and one Type 6 engines. The department also operates a 4000 gallon tender, an ATV and a UTV. The department wants to continue to provide training to its personnel and explore working with new oil companies to prevent wildland fires. The department also wishes to continue the Ready Set Go! program for community members. Arapahoe County Sheriff's Office plans to work with all fire departments in the area by assisting with training and request for assistance.

C. Community Risk Analysis

As part of the CWPP process a community risk analysis was completed for the planning area to determine the wildfire hazards for the area. The purpose of the hazard analysis is to raise awareness of the potential wildfire hazards that exist based on hazard, risk, and values within the planning area.

Three factors were examined to determine the wildfire hazard ratings for areas within the WUI boundary: hazard (fuels), risk (ignition method), and values (structures). The hazard

ratings indicate the level of risk to catastrophic wildland fire in the interface. Current wildfire hazard mapping is not available for the eastern part of Colorado at this time so the 2002 Colorado Wildland Urban Interface Hazard Assessment (Assessment) was used as a basis for this analysis.

The Assessment produced a hazard map that displays areas of concern that are at risk of catastrophic wildland fire. The Assessment included the eastern plains and after overlaying current address point on the hazard map the hazard areas/ratings were still valid with the 2002 model. More information on the methodology for the Assessments can be found in Appendix C. **The assessment does not take into account details such as defensible space, construction materials, ingress/egress routes etc. Consequentially, inferences toward defensibility or hazard level of individual homes, lots, or parcels should never be made based solely on this assessment.**

The Arapahoe County CWPP Wildfire Hazard Map is shown in Figure 1.

ARAPAHOE COUNTY CWPP WILDFIRE HAZARD MAP

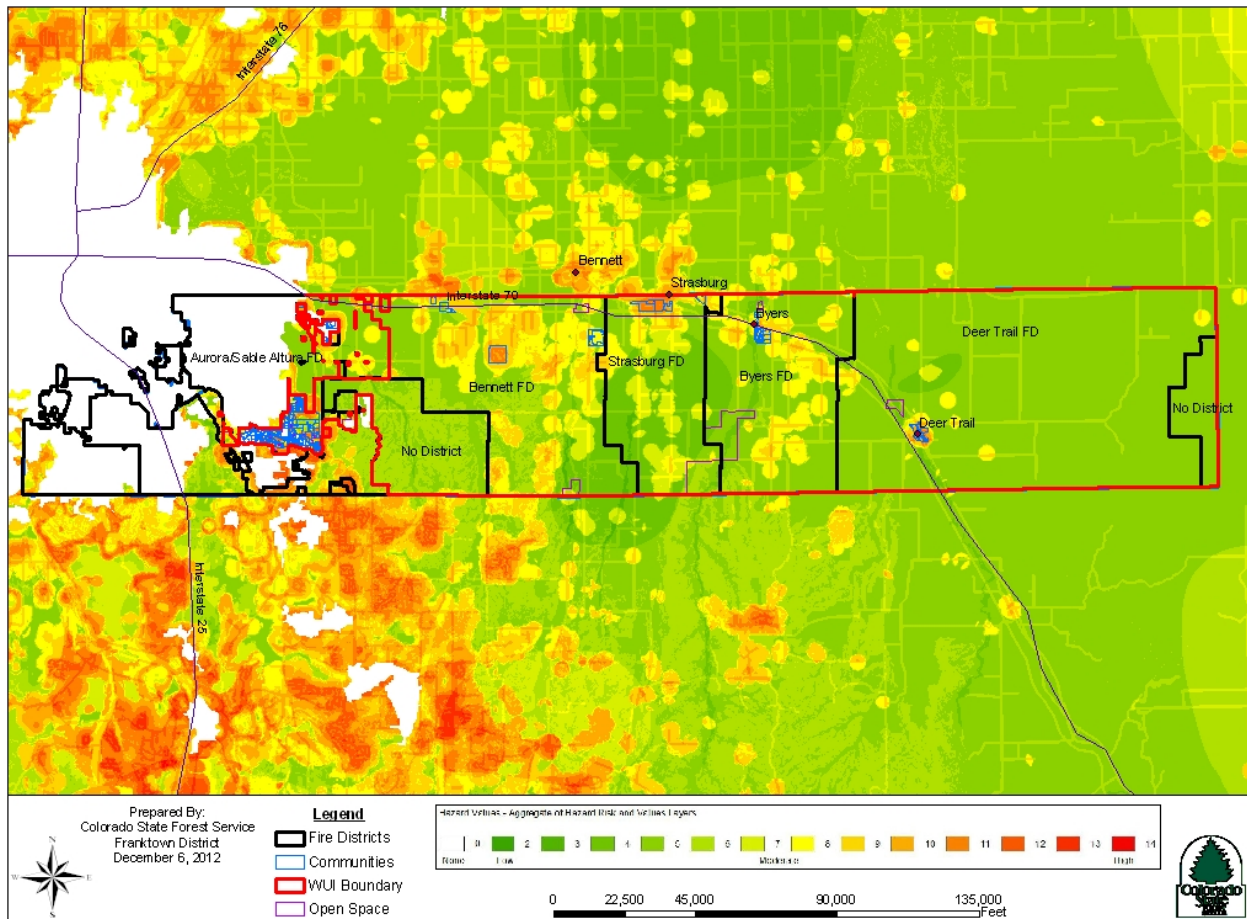


Figure 1: Arapahoe County CWPP Wildfire Hazard Map

Hazards

Hazards refer to the fuels or vegetation and topological features (slope, aspect) that are present within the planning area that affects fire intensity and rate of spread. Wildland fire fuels can be divided into four categories: grazing land, cultivated agricultural land, forested lands, and miscellaneous. Grazing lands are primarily made up of sandhill steppe and prairie, and exhibit rather predictable seasonal burning characteristics. Cultivated agricultural land includes irrigated and non-irrigated crop land and has very dynamic burning characteristics and seasons. Forested land includes the riparian forest, windbreaks, shelterbelts, living snow fences, and urban forests in the WUI. Miscellaneous areas include transportation rights-of-way, fence lines, disturbed areas, and other areas that contain tumbleweeds, grasses, wild sunflowers, and other weeds.

The prairie contains native mixed grasses, small brush, and some introduced grass species. It is generally described as “short grass” and other types of prairie. In many areas livestock grazing maintains a rather sparse fuel load.

Sandhill steppe is a conglomerate of sand sage and mixed grassed, generally including some introduced grass species. These areas are usually grazed by livestock. The fuel load on these lands is moderate to heavy. Very large fires have occurred with this fuel type, especially during times of high winds prevalent in the spring.

The cultivated agricultural land is used to produce various crops including; corn, winter wheat, sugar beets, onions, grass hay, alfalfa hay, carrots, beans, cabbage, sunflowers, millets, and others. Of these, the crops of concern as wildland fire fuel are dormant stands of winter wheat, wheat stubble, mature corn, corn stubble, grass hay, and mature millets and sorghum. Each of these crops is available as fuel during a specific season of the year. These seasons can differ widely. Also, the fields may contain different crops from year to year. This dynamic nature of the fuel locations and seasons of availability adds considerably to the challenge of suppression preparedness.

The forested lands are located along rivers, seasonal water courses, ponds, and lakes; scattered across the county as windbreaks, shelterbelts, living snow fences, and in the vicinity of farmsteads and urban areas in the WUI. In most cases the forest includes a surface cover of grass and brush, which is the primary carrier of the fire. The tree species of concern in the windbreaks, shelterbelts, and living snow fences are primarily Eastern Red Cedar,

Rocky Mountain Juniper, and ponderosa pine. Examples of shrub species include Caragana, Cotoneaster, Chokecherry, Native Plum, Sumac (Skunk Bush), Sandcherry, Nanking Cherry, European Sage, Buffaloberry, and Four-wing Saltbush. In many instances, these species; along with other trees such as Cottonwood, Siberian Elm, Bur Oak, and Hackberry have been planted near homes and outbuildings.

Wildland Fire Fuels' Normal Season of Availability in NE Colorado												
Fuel Type	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Prairie			■	■			■	■	■	■	■	■
Sandhill Steppe			■	■			■	■	■	■	■	■
Dormant Winter Wheat							■	■	■			
Wheat Stubble	■	■	■	■				■	■	■	■	■
Mature Corn										■	■	■
Corn Stubble	■	■	■	■						■	■	■
Mature Millets & Sorghum									■	■		
Forest			■	■	■	■	■	■	■	■	■	■
Miscellaneous Areas	■	■	■	■	■	■	■	■	■	■	■	■

In eastern Colorado the long-term weather patterns have flowed as a series of years of “normal” precipitation, followed by a series of drought years. Generally the fire season is from March through November. In drought years the fire season has been year-long. A period of high winds and an abundance of dried fuels from the previous year have produced extreme fire behavior in early March. There is usually a season of spring moisture and “green-up” from April to early June. Beginning in late May or early June the cool season grasses such as cheatgrass cure out and become available as fuel. In late June wheat begins to cure with harvest beginning in July. This harvest may last three to four weeks and fires can occur in these fields. The wheat stubble left on some fields may remain as fuel throughout the winter. Corn begins curing out in October and is available as fuel until harvest is completed by late November. Corn stubble may remain on the field and be available as fuel until spring tillage begins. The rangeland fuels are available throughout the year, but most prevalent in March and from mid-June through November. Forest fuels include the grasses, brush, trees, and the dead leaves and woody material on the forest floor. These fuels are available year-around in drought years, and from March through November in years of “normal” precipitation.

Within the Arapahoe County CWPP planning area there are seven vegetation types present. These vegetation types are listed in order of abundance. (Shown in Figure 2: Arapahoe County CWPP Vegetation Map).

- Dryland crops (majority of planning area)
 - Examples: wheat, crested wheatgrass
- Short-grass prairie
 - Examples: blue gramma, buffalo grass
- Mid-grass prairie
 - Examples: western wheatgrass, needle and thread
- Tall-grass prairie
 - Examples: big and little blue stem

- Forest dominated wetland/riparian
 - Locations: East Bijou Creek, West Bijou Creek, Wolf Creek, Kiowa Creek, and Coal Creek
- Irrigated crops
 - Examples: row crops, alfalfa, irrigated pasture
- Graminoid and forb dominated wetland/riparian
 - Locations: Middle Bijou Creek

ARAPAHOE COUNTY CWPP VEGETATION MAP

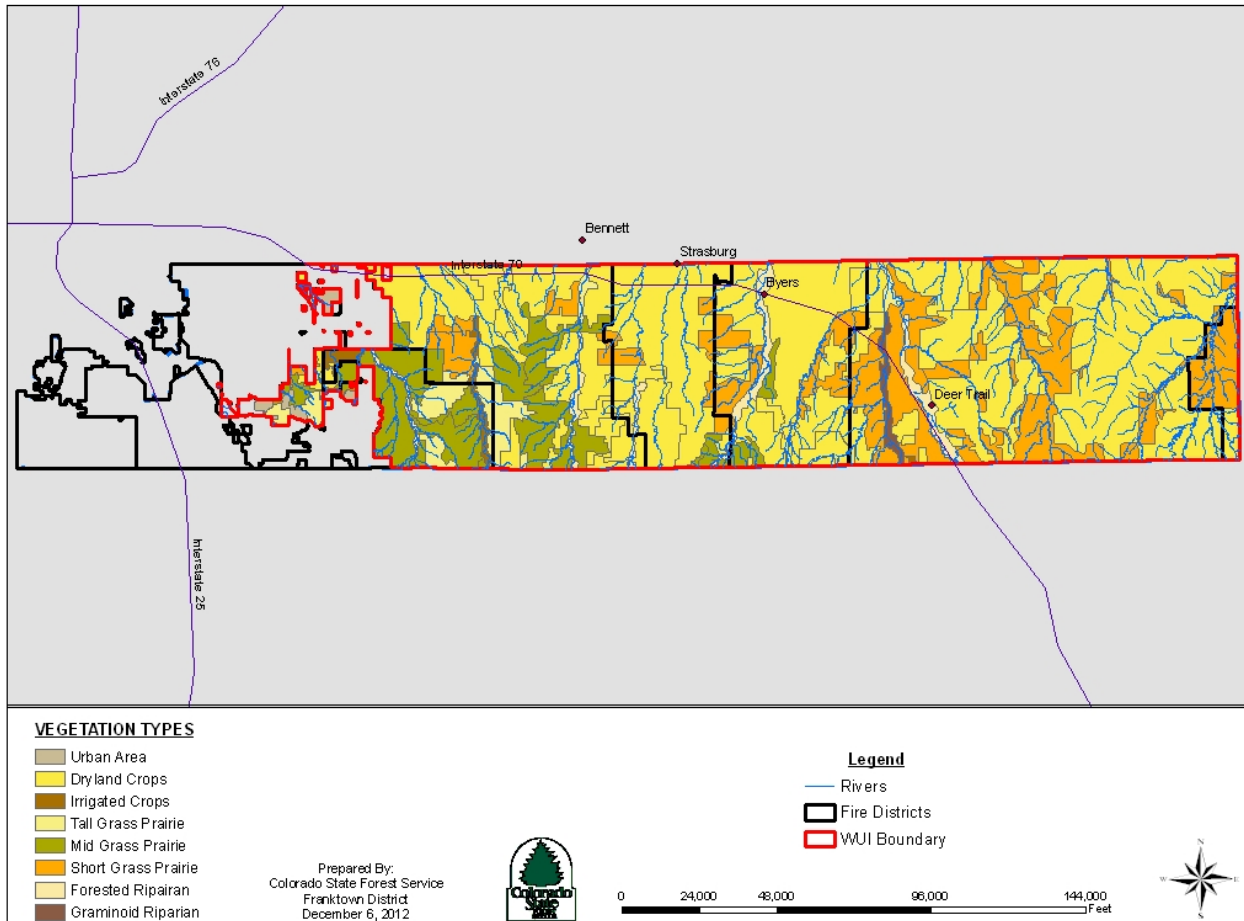


Figure 2: Arapahoe County CWPP Vegetation Map

Fire Behavior

Wildland fires have been studied in great detail to help predict fire behavior. Predicting a fire's intensity, rate of spread, duration, direction and spot-fire production is important for firefighter safety and is the basis for tactical decisions made during the suppression of a fire.

Three factors affect wildland fire behavior in the WUI:

1. **Fuels:** The type, continuity and density of surrounding vegetation and, sometimes, flammable structures, provide fuel to keep the fire burning.
2. **Weather:** Wind, relative humidity and atmospheric stability all affect potential fire behavior.
3. **Topography:** The steepness and direction of slopes, and building-site location in relation to topography are features that affect fire behavior.

The only factor that we can have direct influence over is fuel.

Fuels are defined as anything that burns in a fire and were described at the beginning of this section.

Weather

Weather is the major factor that affects fire behavior and is highly variable in terms of time, intensity and location.

Wind: Surface winds are the most important element in determining fire direction and rate of spread. Wind pushes flames into adjacent fuels, facilitating rapid ignition, and tends to be the common theme in large fire events. High-velocity, warm, dry, down-slope winds, such as a Chinook, can cause fuels to dry rapidly, resulting in extreme fire behavior.

Relative Humidity (RH): RH is a measure of how much moisture is in the air compared to the maximum amount of moisture the atmosphere can hold at that temperature. RH has a major influence on the moisture content of dead fuels. The smaller the dead fuel, the faster it will react to a change in the RH. Cured grass can dry out in less than 15 minutes when a dry air mass moves into an area. Firefighters generally monitor RH on an hourly basis when fighting a fire.

Temperature: Before combustion can occur, fuels must reach ignition temperature (approximately 450° F); fuels heat up and reach ignition temperature more quickly on hot days. In addition, when fuels are preheated, fire expends less energy and will burn at a higher intensity.

Topography

Slope: Defined as the angle of the ground relative to the horizon, slope commonly is measured in degrees or as a percent. On calm days, heated air, including flames, rises and preheats the fuels upslope, which causes an increase in fire spread. On gentle slopes, this has little effect on fire behavior, but on steep slopes, the effect can be significant. During summer months, preheating generally causes winds to blow upslope. The combined effect of slope and wind results in rapid fire spread.

Aspect: Aspect is the direction the slope faces. South and southwest aspects are warmer and drier than north and northeast aspects. South, southwest and west aspects generally have lighter fuels and are more susceptible to fast-moving fires. North, northeast and east aspects tend to have heavier fuels and, under normal conditions, have slow-moving surface fires. Under extreme conditions, these aspects can burn with high intensity and fires can be difficult or impossible to control.

Climate: Fire seasons in Colorado's high country and on the Western Slope tend to last from late spring until mid-autumn. Fire seasons on the Front Range and Eastern Plains tend to be split, with most large fires occurring in the spring or fall. It's important to keep in mind that these are generalizations and that large fires can occur anytime conditions are right.

Risk

Risk is defined as the probability of ignition from various sources. In Arapahoe County the primary ignition sources are roads (I-70), railroads, debris burning, powerlines, electric fences, equipment sparking on rocks. Roads and railroads are shown in Figure 3: Arapahoe County Road and Railroad Hazard Map. The Wildfire Hazard Map that was used for this analysis used lightning strike density and road buffers of 100m for roads and railroads to determine risk.

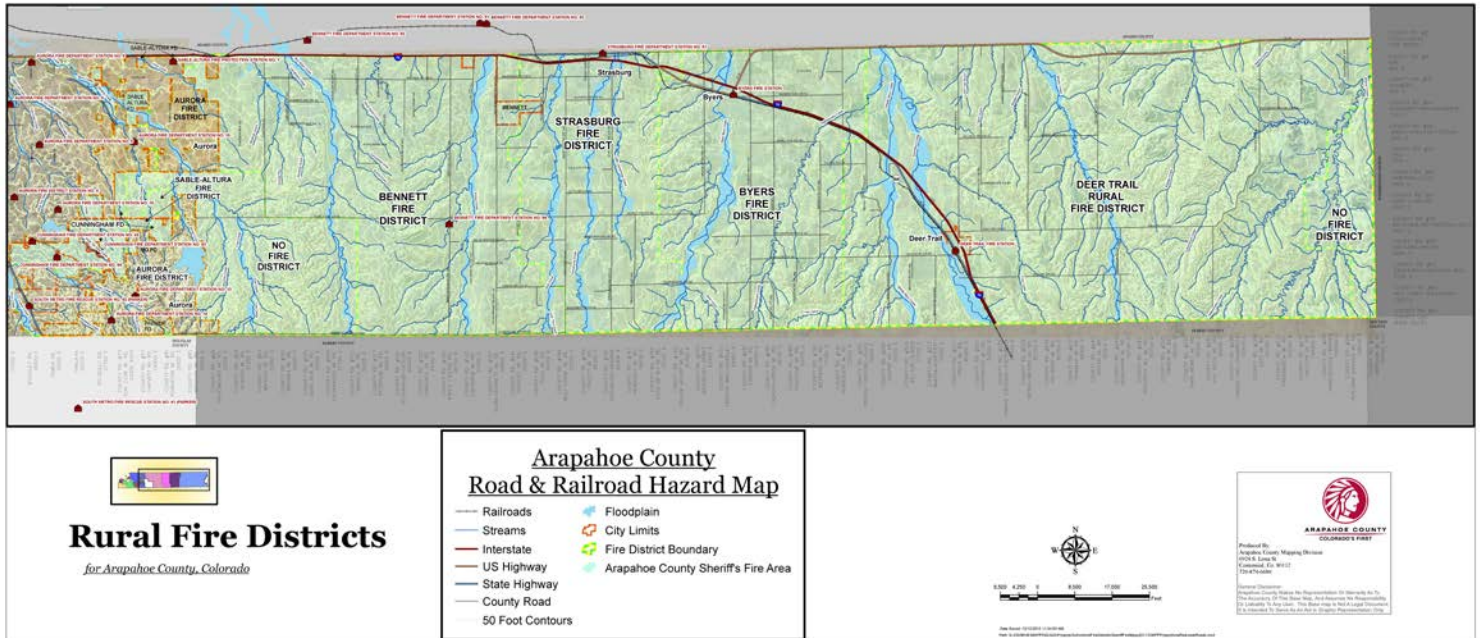


Figure 3: Arapahoe County Road and Railroad Hazard Map

Values

Values are defined as homes for this analysis. Other values at risk include windbreaks, livestock, infrastructure (buildings), wildlife habitat, range, watersheds/riparian areas.

Hazard Ratings

After the hazard, risk, and values were analyzed a hazard map was produced using the 2002 Assessment (Figure 1). The majority of the planning area is rated at a low-moderate hazard rating primarily due to the dominant vegetation present (dryland crops) and limited concentration of homes. There are areas where the wildfire hazard ratings increase to moderate-high, which is primarily where communities/concentrations of homes are located. Within the moderate-high hazard areas there will be areas of high and low-moderate mixed in due to the proximity of vegetation to homes. County-owned lands rated a low hazard for the majority of areas except for Kiowa Creek North, which rated at a moderate.

Wildfires can be devastating, with long-term impacts. Direct financial costs include such things as fire suppression efforts, evacuation, property loss, insurance, and restoration and rehabilitation efforts. Indirect costs and effects include risk to life and property, loss of cultural landmarks, recreation, wildlife, aesthetics, soil erosion, and air and water quality. For those who live on the plains, fires can cause loss of grazing lands, crops, etc., thus having a huge financial impact.

D. Structural Ignitability Reduction Discussion

Efforts to reduce structural ignitability can be separated into regulations governing development designs, building materials and vegetation management (defensible space around structures). Public education campaigns designed to raise awareness and move those who are aware to action to reduce hazardous fuel loads within the home ignition zones and beyond complement the regulatory efforts.

In order to identify and understand methods for increasing a structure's ability to survive a wildfire it is important to first understand how structures burn during a wildland fire. Homes ignite and burn by meeting the parameters for ignition and combustion (Cohen 2008). Homes in the WUI are fuel. Structures may be ignited by firebrands, which are embers that are lofted through the air from a moving flame front or by radiant or convection heating. Firebrands can ignite structures by landing on flammable materials either *on* or *surrounding* a structure. Firebrands are particularly detrimental to structures with flammable building materials including wood shake roofs. Accumulations of flammable materials in roof valleys, in gutters, or directly adjacent to the structure can significantly increase a structure's vulnerability.

The two main factors affecting a structures ability to survive a wildfire are the exterior building materials and the amount of defensible space surrounding the structure within 100 feet to 200 feet of the structure, known as the *Home Ignition Zone* (Cohen 2008). The home ignition zone typically is located on private property, which requires property owners to recognize the hazards, take ownership and responsibility of the hazards, and mitigate the hazardous fuels to a level that will increase the survivability of the structure.

Construction materials within the CWPP planning area include roofs made of wood shingles, asphalt, and clay tile. Decks are comprised of wood and composite material. Siding is composed of hardiplank, vinyl, and wood.

Building Materials

- Replace older shake roofs with those of a higher fire resistive rating including asphalt composition, tile or metal roof assembly
- Replace wood siding with a more fire resistive cement product including cement, stucco, cement plank siding, stone or masonry
- Screen attic, roof, foundation and eave vents openings with 1/8" metal screens
- Enclose areas under decks completely
- Windows should be double-paned or tempered glass

For more information visit <http://www.firewise.org>

Defensible Space

Defensible space is the area around a home/structure where vegetation has been reduced and/or altered, breaking up its continuity. This will slow the rate and intensity of an advancing wildfire and create an open area where firefighters can safely work to protect your home. You can reduce your wildfire risks by following these defensible space guidelines:

- Defensible space dimensions are subjective and differ upon site and vegetation characteristics. However, defensible space on flat sites should typically extend a minimum of 70 feet around your home.
- Create a zone within initial 15 feet surrounding home and structures by clearing all flammable vegetation. Thin out continuous tree and brush cover, and remove any existing ladder fuels. Plants should be manicured and grasses mowed. Routinely maintain your safety zone by removing dry and dead vegetation.
- Prune tree branches 10 feet from the ground or 1/3 the height of the tree, whichever is less. Remove dead branches that extend over roofs and keep roof gutters clean of any leaves or debris.
- Dry grasses and weeds should be mowed to a maximum six inches within 30 feet of all structures.
- Trees and shrubs should be thinned accordingly beyond the initial 15-foot zone. A good rule of thumb is 10-15 foot crown spacing with occasional clumps of two or three trees.
- Stack firewood at least 15 feet away and uphill from the house.
- Maintain a 10-foot area free of all vegetation around grills, burn barrels, and propane tanks. Non-flammable screens should be placed over grills and burn barrels.
- Create a fuelbreak between Conservation Reserve Program (CRP) land and your own private property.
- All LPG tanks (butane and propane) should be located at least 30 feet away from any structure, and surrounded by a 10-foot area free of all vegetation.
- Never store flammable material (chemicals, fuel, lumber, slash etc.) in an open exposed area. Store neatly in a garage or barn where it will not be vulnerable to heat or open flame.
- Skirting material around mobile homes can prevent burning debris from blowing and spreading fire under your home; it also protects kids and pets from exposed gas lines and wiring underneath.
- Move combustible yard furniture away from your home.

Other Values:

- Keep trash cleared from around barns and outbuildings and remove infringing vegetation away from these areas.
- Break up haystacks, and manure and disperse any other type of combustible fuel.
- Establish and maintain a fuelbreak around windbreaks and snow fences by mowing grasses and vegetation to a maximum 3 inches in height; keep these areas cleared of trash and dead vegetation.
- Keep grasses and vegetation mowed in areas where you park vehicles and equipment. This will reduce the risk of hot exhaust systems coming in contact with vegetation, thus igniting grass fires.

Burning Trash and Ditches

- Know and follow local burning regulations and procedures — you may have to notify local authorities that you are burning (or before you burn). Refer to Colorado Air Pollution and Control Division website for more information on prescribed burning: <http://www.colorado.gov/cdphe/smoke>
- Delay outdoor burning until your area greens up and weather permits. Never burn on hot, dry, or windy days. (To get a detailed fire weather forecast go to: http://www.crh.noaa.gov/bou/firewx/fire_mainmap.php)
- When debris burning is allowed, always burn trash in a barrel or metal receptacle covered with wire mesh to contain burning embers. Place burn barrel on bare mineral soil in an area free of vegetation. Never leave your fire unattended and make sure it is completely extinguished before you leave.
- Before ditch burning make sure to contact your local sheriff's department and/or fire protection district to notify them of your burning. Inquire whether or not burn bans are in place and if a permit is required prior to burning.

E. Recommended Fuel Treatments and Methods

Because of the rural nature of the planning area landscape scale treatments were not feasible. The Core Team determined that it was more effective for landowners to focus on creating defensible space around their homes, outbuildings, and windbreaks to be most effective in reducing wildfire hazards.

Fuel Treatment Priorities

- Create defensible space around homes, barns, other infrastructure following the guidelines referenced in section *D. Structural Ignitability Reduction Discussion*. Work can be accomplished by using mowers, weed wackers, chainsaws, and chippers.

- Mow around structures/windbreaks.
- CDOT and Arapahoe County Road and Bridge mow the medians and shoulders of the roads within the WUI at least once a year for weed control.
- Union Pacific railroad conducts regular weed control using herbicides on their railroad line that bisects the WUI.
- Arapahoe County Open Space regularly mows their parks to include the fairgrounds. They mow along the perimeter and on either side of the trails. A large firebreak/mow line is mowed along Quincy Ave. on the north end of the fairgrounds property to prevent any fires from expanding that start along the roadway. Open Space tries to mow 2-3 times a year and also mow just before fair at the fairgrounds.

F. Outreach and Education Activities

Fire protection districts, communities, and other agencies utilize various wildfire mitigation education programs including Ready, Set, Go!, Are You FireWise?, and FireWise Communities.

Ready, Set, Go!

The Ready, Set, Go! Program utilizes firefighters to teach individuals who live in high risk wildfire areas and the wildland-urban-interface (WUI) how to best prepare themselves and their properties against fire threats. Ready, Set, Go! works in complimentary and collaborative fashion with Firewise and other existing wildland fire public education efforts. It amplifies their messages to individuals to better achieve the common goal we all share of fire-adapted communities.

The RSG program provides the implementation guidance; background knowledge; and presentation tools to assist fire departments in delivering the program message:

- **Ready – Preparing for the Fire Threat:** *Take personal responsibility and prepare long before the threat of a wildfire so your home is ready in case of a fire. Create defensible space by clearing brush away from your home. Use fire-resistant landscaping and harden your home with fire-safe construction measures. Assemble emergency supplies and belongings in a safe spot. Make sure all residents residing within the home are on the same page, plan escape routes.*
 - **Set – Situational Awareness When a Fire Starts:** *Pack your vehicle with your emergency items. Stay aware of the latest news from local media and your local fire department for updated information on the fire.*
 - **Go – Leave early!** *Following your Action Plan makes you prepared and firefighters are now able to best maneuver the wildfire and ensuring you and your family's safety.*
- (www.wildlandfirersg.org, 2012)*

Arapahoe County is a participant in this program and more information can be found at www.co.arapahoe.co.us/Departments/SH/

Are You FireWise?

The CSFS, in partnership with Larimer County and Poudre Fire Authority, developed Colorado's Are You FireWise? guidelines. Subsequently, these guidelines were adapted for homeowners and landowners living on Colorado's plains.

Many people don't realize that they face serious wildfire danger. But if you live in the foothills, grasslands or mountains of Colorado, you are at risk! Compounding the problem is the exploding population in once-rural areas surrounding municipalities. The result is that more homes and more lives are potentially threatened by wildfire every year.

*To be FireWise, you must carry out certain fire-protection measures before a fire even starts. By following the fire-safety guidelines listed here, your home will have a chance to survive while firefighters work to bring the wildfire under control. Remember, a fire department's effectiveness in battling a wildfire starts with YOU!
(<http://csfs.colostate.edu/pages/wf-protection.html>)*

FireWise Communities

The National Fire Protection Association's (NFPA) Firewise Communities program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from the risk of wildfire. The program is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters.

To save lives and property from wildfire, NFPA's Firewise Communities program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. We all have a role to play in protecting ourselves and each other from the risk of wildfire. (www.firewise.org, 2012)

G. Implementation Plan

Education/Outreach Activities

Ongoing education and outreach is an integral part to a successful CWPP especially given the area covered by this CWPP. The most effective community outreach will take place through the individual fire departments, county-wide efforts, and individual HOAs. Monthly board meetings, annual meetings, newsletters, and email contact lists are avenues to get information out to local residents.

Priorities include:

- Continue promoting the Ready, Set, Go! Program by the Arapahoe County Sheriff's Department. Target audiences include communities and rural landowners.
Responsibility: Arapahoe County Sheriff Office
Timeframe: Ongoing

- Develop communications plan for outreach activities.
Responsibility: Arapahoe County Sheriff Office
Timeframe: 2013
- Initiate county-wide information outreach (Examples - Firewise, Fire Bans) through public radio announcements, Arapahoe County web-site alerts, newspaper articles, highway signage, county fair booth participation, local event opportunities, (Fire Prevention Week, annual volunteer displays, Senior Citizen events, community events, etc.).
Responsibility: Arapahoe County Sheriff Office, Fire Protection Districts, HOAs
Timeframe: Ongoing
- Provide educational material including Firewise 3-ring binder availability for check out to homeowners (library/fire department); booklets and/or handouts for local events; CDs/PDFs for distribution; Firewise educational handouts for schools.
Responsibility: Arapahoe County Sheriff Office, Fire Departments
Timeframe: Ongoing
- Provide Firewise presentations to interested homeowners, volunteer groups/clubs to support public awareness.
Responsibility: Arapahoe County Sheriff Office, Colorado State Forest Service, Fire Departments
Timeframe: Ongoing

Fire Department Training

Fire departments can contact the Colorado Division of Fire Prevention and Control (DFPC) for more information on receiving NWCG training in wildland fire.

Fire Equipment

The Volunteer Fire Assistance (VFA) grant program targets assistance to rural fire departments in the areas of training, equipping, and organization. VFA exists to increase the ability to respond to wildland fire and to cooperate and communicate with federal wildland fire agencies. Equipment and training that supports wildland fire response and cooperation and communication are the priority. Funds are distributed annually to selected applicants according to established priorities and program guidelines. Large equipment such as fire trucks are discouraged because the cost significantly exceeds available grant funding. This would be a program for the departments to look into for wildland hose, personal protective equipment, radios (VHF), NWCG training.

The Federal Excess Personal Property Program (FEPP) provides retired vehicles from the Department of Defense and other federal entities, which become property of the U.S. Forest Service and are loaned to rural fire departments. Together, the DFPC and USFS absorb nearly all costs of the engine fleet program to ensure that fire departments around the state

have the necessary equipment to fight fires. The DFPC fire equipment shop converts the vehicles to functional fire engines and provides ongoing major vehicle maintenance on the fleet. Recipient fire departments are only required to contribute \$200 annually to help cover travel costs for DFPC fire shop mechanics, who must complete annual inspections on the vehicles.

Fire departments can contact the Colorado Division of Fire Prevention and Control (DFPC) for more information on the VFA and FEPP programs.

Next Steps

As the Arapahoe County CWPP process evolves it has become clear the best option to continue forward momentum and collaboration is to provide some uniformity throughout the county on implementing the recommendations in this plan. As with any CWPP the plan should be reviewed annually and updated as necessary and approved by the Core Team.

Appendices

Appendix A: CWPP Meeting Agendas

Agenda
Community Wildfire Protection Plan Meeting
Wednesday, July 13th, 2011
6:30 pm – 8:00 pm

Strasburg Fire Department - 56281 E. Colfax Ave

6:30 pm-8:30pm with dinner

I. Introductions (15 minutes)

II. Community Wildfire Protection Plan (CWPP) & Overview of process (30 minutes)

1. Introduction

- What is a CWPP
- Review Leaders Guide and Minimum Standards

2. Mapping Exercise (Wildfire Assessment Exercise – Values, Fuels, Fire Risk)

3. Planning/ brainstorming session (Identify priorities/risks. Use Firewise tactics to mitigate risks)

4. Implementation of the plan (realistic, tangible action)

V. Preliminary Wildfire Mitigation Assessment Mapping Exercise (1 hour 15 minutes)

- Define Risk, Hazards, Values
- Map areas within district (General areas of risk, hazards, values)
- Review Map & Minimum Standards (Send comments to Karl for next meeting)
- Assign hazard rating take home to FPD

IX. Next meeting date Wednesday August 3rd 7pm-9pm

1. Participants
2. Plan Content
3. Level of specificity
4. Combining other Plans

Agenda
Community Wildfire Protection Plan Meeting
Wednesday, August 3rd, 2011
6:30 pm – 8:00 pm

Strasburg Fire Department - 56281 E. Colfax Ave

I. Introductions (10 minutes)

II. Review Community Wildfire Protection Plan (CWPP) & overview of process (15 minutes)

- Review of what is a CWPP
- Review Minimum Standards

III. Review Mapping Exercise (Wildfire Assessment – Values, Fuels, Fire Risk) (15 minutes)

- Look at High (red) and Moderate (Blue) assessment maps
- Make changes as needed

IV. Participation (5 minutes)

- Sign in sheet

V. Components (1 hour)

- WUI definitions
 - Plains WUI definition or accepted HFRA definition
 - Geographic WUI description and definition with hazard rating
 - map and narrative
- Identified adjacent landowners
 - Map and narrative
- Risk analysis (hazard rating form)
 - Fuel hazard
 - Risk of wildfire occurrence
 - History of Wildfire Occurrence –Fire reporting and local knowledge
 - Community values to be protected
- Preparedness to respond to wildfire (FPD Staffing, Response areas and times, equipment, training, communications, dispatch, agreements, pre attack plans, evacuation routes, staging areas, ICP locations, waters sources, known hazards etc.)

VI. Next meeting date Wednesday

- Level of specificity for the Implementation Plan
 - Recommendations to reduce structural ignitability for each WUI community

Implementation Plan: Education, Hazardous fuels reduction, water development, escape routes, safety zones, road improvement etc.

Priority Level: High – Low or 1-10

Location: description or latitude/ longitude, size, map

Mitigation Action: narrative

Technical specifications: methods for treatment, education / outreach

Timeline: completion and monitoring challenges and accomplishments

Responsibility: organization, individual

Potential funding sources: eg. SFA, HB1199

Potential Contractors: eg. Local,

Community Input: date and narrative

Agenda
Community Wildfire Protection Plan Meeting
Wednesday, September 21, 2011
6:30 pm – 8:00 pm

COLORADO STATE FOREST SERVICE
MINIMUM STANDARDS FOR DEVELOPING COMMUNITY WILDFIRE
PROTECTION PLANS

I. Plan Participants

- A. The plan must exhibit diverse collaboration with emphasis on involvement of community members/representatives.
- D. Early in the planning process, it is imperative to engage community members, community representatives, and other interested, non-governmental stakeholders, and keep them engaged throughout the entire process. Interested non-governmental stakeholders must be regularly and actively involved in identifying community values to be protected, defining their wildland-urban interface area, identifying fuels treatment project areas and methods, and priorities for action.
- E. Community involvement and participation can be documented through meeting minutes, meeting rosters, or community surveys that clearly document meeting results and the number of participants.

Plan Components

- A. Community Wildfire Protection Plans must include:
 - 1. A definition of the community's wildland-urban interface (WUI) outlined on a map with an accompanying narrative. **IN PROGRESS**
 - 2. Identification of adjacent landowners (land that touches the community's external boundary). **IN PROGRESS**
 - 3. A community risk analysis that considers, at a minimum, fuel hazards, risk of wildfire occurrence, and community values (i.e. watershed, wildlife habitat, and infrastructure) to be protected – both in the immediate vicinity and the surrounding zone where potential fire spread poses a realistic threat. Consider recent large fire behavior and fire spread in this discussion. **IN PROGRESS**
 - 4. A discussion of the community's *preparedness* to respond to wildland fire. **IN PROGRESS**
 - 5. Recommendation of methods to reduce structural ignitability.
 - 6. An implementation plan that includes:
 - Identification of fuels treatment projects. For each project, identify or describe:
 - The type of treatment recommended (examples include fuelbreaks, thinning, pruning, prescribed burning, etc.)
 - Suggested or preferred method of treatment (examples include using hand crews to thin and pile slash; mastication; machine-piling slash; roller-chopping slash; commercial timber harvest; etc.)

- A project area map that illustrates all proposed treatments and exhibits close approximations of the boundaries of each project.
- A narrative or table that details the relative priority of each project. Fuels treatment priorities should include both landscape-scale and localized (within the community) treatments.

Next Steps

- Complete Fire Department Information Sheets: **mid-October**
- Determine fuel treatment projects: **end of October (via e-mail or meeting)**
- Draft plan, review: **December/January**
- Community meetings, post on website, etc.: **January 2012**
- Final draft: **February**
- Approve plan: **Feb/March**

Appendix B: CWPP Community List

Byers Communities (5)

Town of Byers
Bradbury Estates
Bijou Valley Estates
Grand View Estates
Bijou Knolls

Deer Trail Communities (2)

Town of Deer Trail
Latigo Ranch

Strasburg Communities (4)

Town of Strasburg
Commanche Crossing
Junes Country gardens
Strasburg Heights

Bennett Communities (6)

Antelope Hills
Valla Halla Estates
Jacob's Farm
Box Elder Estates
Thunder Ranches
Watkins Farm

Sable Altura Fire District Subdivisions (6)

Gunclub Estates
Thunderbird Estates
Picadilly Estates
Aetna Estates
New World
Fox Ridge Farms

No Fire District (1)

Dove Hill

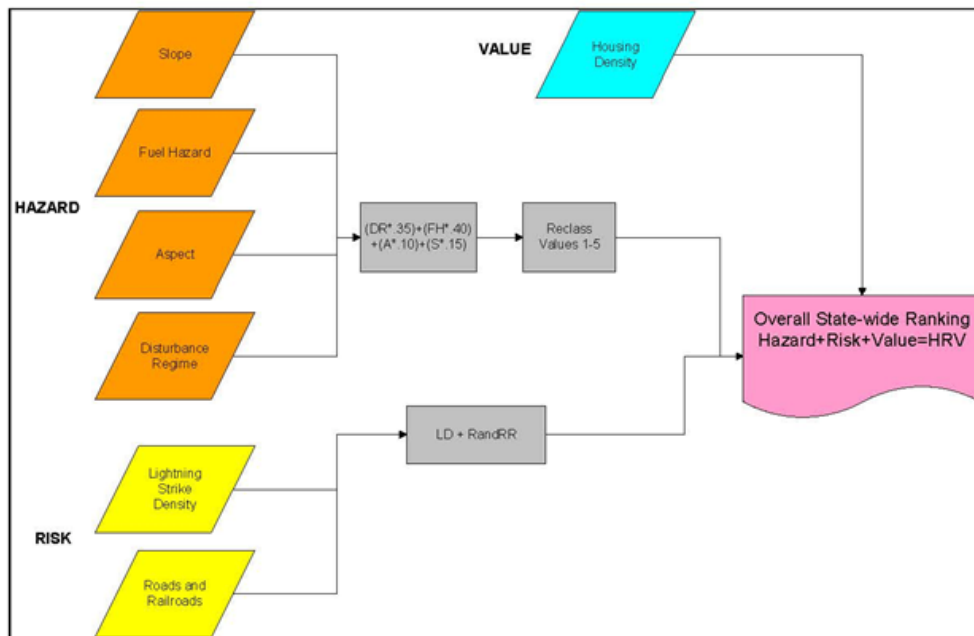
Cunningham Fire District (20)

Fairgrounds
Fox Hill
Tuscany
Piney Creek
Spring Creek Meadows
Copperleaf
Saddle Rock
Trail Ridge
Willow Trace
Park View Meadows
Park View Terrace
Parkborough
Parkview Heights
Parkview Commons
Smoky Ridge
Mesa
Hampden Villas
Jackson Farm
Saddle Rock Highlands
Smoky Hill

Total Communities within WUI Boundary: 44

Appendix C: Wildfire Hazard Assessment Methodology

Colorado Wildland Urban Interface Hazard Assessment Methodology



Skip Edel
Colorado State Forest Service
May 16th, 2002

Background

Geographic Information Systems (GIS) is a tool that allows for comparison and analysis of geographic phenomenon. Differing sets of data can be compared based on their spatial location information. In the mid-nineties, GIS was recognized as an ideal tool to use in determining wildfire hazard, by comparing values such as slope, vegetation, housing density, ignition history, and aspect throughout Colorado. GIS provided the tools to implement a state-wide analysis that was previously extremely difficult.

The Front Range Redzone Project was one of the first attempts to map the fire hazard along Colorado's Front Range, incorporating slope, aspect, and fuels. The project centered on the areas of highest housing density – the urban and suburban areas along the Front Range. This project started the Redzone concept in Colorado and provided a great educational tool to convey wildland fire danger. Due to the success of the Front Range Redzone project the scope was expanded to include the remaining forested lands in Colorado. This state level project was called the Midlevel Assessment. The Midlevel Assessment took a more detailed look at the state and included more accurate information on fuels, population growth, and distribution. Even this more detailed information lacked the resolution to accurately map population densities in the western portion of Colorado. Some portions of the Midlevel Assessment are used in this mapping effort, specifically the values for slope, aspect, and vegetation.

The Colorado Wildland Urban Interface Hazard Assessment builds on the work of earlier hazard methodologies and provides new and updated data to further enhance accuracy and scale. A better, more accurate housing density surface was created to assist in ranking the Wildland Urban Interface hazard. This assessment also includes all of the counties in Colorado, including the eastern plains counties, which were previously omitted. The final outputs are a Risk, Hazard, and Value (RHV) map displaying areas of concern that are at risk of catastrophic wildland fire.

This project is a joint effort of CSFS, USFS, BLM, NPS, and other interested parties.



Approach

The Colorado Wildland Urban Interface Hazard Assessment uses three main layers to determine fire danger, Risk, Hazard, and Values. The following lists include the data used to create each of the three layers.

1. Risk – Probability of Ignition
 - a. Lightning Strike density
 - b. Road buffer – 100 meter buffer of roads and railroads in Colorado.
2. Hazard – Vegetative and topological features affecting intensity and rate of spread
 - a. Slope
 - b. Aspect
 - c. Fuels – Interpreted from CDOW GAP Vegetation information.
3. Values – Natural or man-made components of the ecosystem on which a value can be placed.
 - a. Housing Density – Life and property
4. Non-flammable areas Mask – a mask was created to aid in the analysis for areas that will not carry fire such as rock and water areas. Urban areas were included in these non-flammable areas if there was not a significant source of vegetation to carry the fire. These areas show in the final assessment as a zero value for fire hazard.

Scale

The Colorado Wildland Urban Interface Hazard Assessment is meant to be used as a tool to compare fire hazard in various areas in Colorado and within counties. The data is not meant to be used to determine fire hazard at the subdivision or parcel level scale. The assessment data and process steps are provided to allow counties or subdivisions to substitute better, higher resolution data for comparing portions of small areas of counties, subdivisions, or individual parcels.

Process Outputs

One of the objectives to creating a Statewide Wildfire Hazard Assessment is to assist in prioritizing and planning mitigation projects. The other is to update the Redzone maps which have proved to be a useful communications tool.

The following maps are the Process Outputs and represent the combination of the Risk, Hazard, and Values layers:

Risk + Hazard + Value (housing density) = RHD

Redzone Map = buffered high values from the assessment showing high hazard areas.

GIS Process Steps

Data layers were collected or contracted for all of the layers stated above. Use National Elevation Dataset for the creation of the base 30 meter DEM layer. Create all grids based on this DEM layer with the same cell size and extent. Change any NO Data values to 0. The steps are as follows:

1. Risk

- a. Lightning Strike – Determines areas of high lightning strike occurrence and corresponding rise in ignition potential. Only the positive polarity strikes are used to create the density surface.¹ Source: BLM lightning strike data. Create density surface and classify to:

Reclass Value	Density
4	High
3	Medium
2	Low
1	Very Low

- b. Roads – Buffer existing roads by 100m and reclass the buffer areas to 1, all other areas will receive a value of 0.
- c. Add the Lightning Strike and Roads grids together for the Risk Grid.

2. Hazard

- a. Create Slope from 30m USGS DEM and reclassify the grid as described in NFPA 299, 1991, (slope in percent):

Slope %	Rating	Reclass Value
0 – 5	Mild	1
6 – 20	Moderate	2
21 – 40	Steep	3
41+	Extreme	4

- b. Create Aspect from 30m USGS DEM and reclassify the grid as described in NFPA 299, 1991, (aspect in degrees):

Aspect°	Reclass Value
0-160 or 200-360	1
160-165 or 195-200	2
165-175 or 185-195	3
175-185	4

¹ Correlation between positive polarity strikes and wildfire ignition: “ArcGIS Extensions – Identifying Areas of High Risk to Wildfires” ESRI, 2002. “Lightning Ignition Efficiency” notes from John Calkins, ESRI, 2002. “Lightning Detection and Operation Systems in North America” Peter Brookhouse, Australian Brushfire Conference, 1999.

- c. GAP Vegetation codes were reviewed by CSFS, USFS, and BLM employees and ranked based on Fuel Hazard and Disturbance Regime. Fuel hazard represents a qualitative ranking based on flammability during an average burning day. Disturbance regime is also a qualitative ranking based on the average length of the return interval.
 - i. Fuel Hazard – create grid for vegetation hazard rating and reclassify based on CDOW GAP VEG primary codes. Ratings based on values derived in Colorado Red Zone Analysis, “Colorado Fire Protection Assessment Report”, “Colorado Mid-Level Wildfire Hazard Assessment Report”, and CSFS District Forester evaluations (see Appendix A for codes). Fuel hazard represents a qualitative ranking based on flammability during an average burn day.
 - ii. Disturbance Regime – CDOW GAP Vegetation Primary codes reclassified based on methodology used in the Colorado Red Zone Analysis, “Colorado Fire Protection Assessment Report”, “Colorado Mid-Level Wildfire Hazard Assessment Report”, and input from CSFS District Foresters (see Appendix A for codes). Disturbance regime is also a qualitative ranking based on the average length of the return interval.
- d. Hazard = [Disturbance_Regime]*0.35 + [Fuel_Hazard]*0.40 + [Aspect]*0.10 + [Slope]*0.15
- e. Classify Hazard grid to five equal intervals and reclass to values 1 (low) – 5 (high).

3. Values

- a. Housing Density, Life and Property – Source: Dr. Dave Theobald, Colorado State University² and Dr. Brian Muller, University of Colorado Denver. Data was created using a combination of parcel data, well head location data, and Census information. Projections were also made for housing densities in 2010 and 2020 to allow for future risk projections.
 - i. Create a density surface and classify as follows:

Houses per Acre	Reclass Value	Density Class
0 – 0.004	0	Public or Vacant
0.004 – 0.025	3	Ranchette
0.025 – 0.1	4	Low
0.1 – 0.5	5	Medium
0.5 – 1	4	High
1 - 9999	2	Urban

- 4. Non-flammable areas Mask – a mask was created to aid in the analysis for areas that will not carry fire such as rock and water areas. Urban areas were included in

² See Appendix B – “Mapping Housing Density for Prioritization of Urban/Forest Wildfire Hazards in Colorado”, David M. Theobald and Mary Kneeland.

these non-flammable areas if there was not a significant source of vegetation to carry the fire. These areas show in the final assessment as a zero value for fire hazard. Values for the mask were derived from the DOW GAP vegetation information and used for Front Range urban areas. These areas were used to create “holes” in the state coverage masking out non-flammable areas.

5. Combination of Hazard, Risk, and Value Layers – Grids were added together to create the final HRV grid showing areas in the state at high risk to catastrophic wildland fire in the interface. Values ranged from 2-15 and were coded for best display.

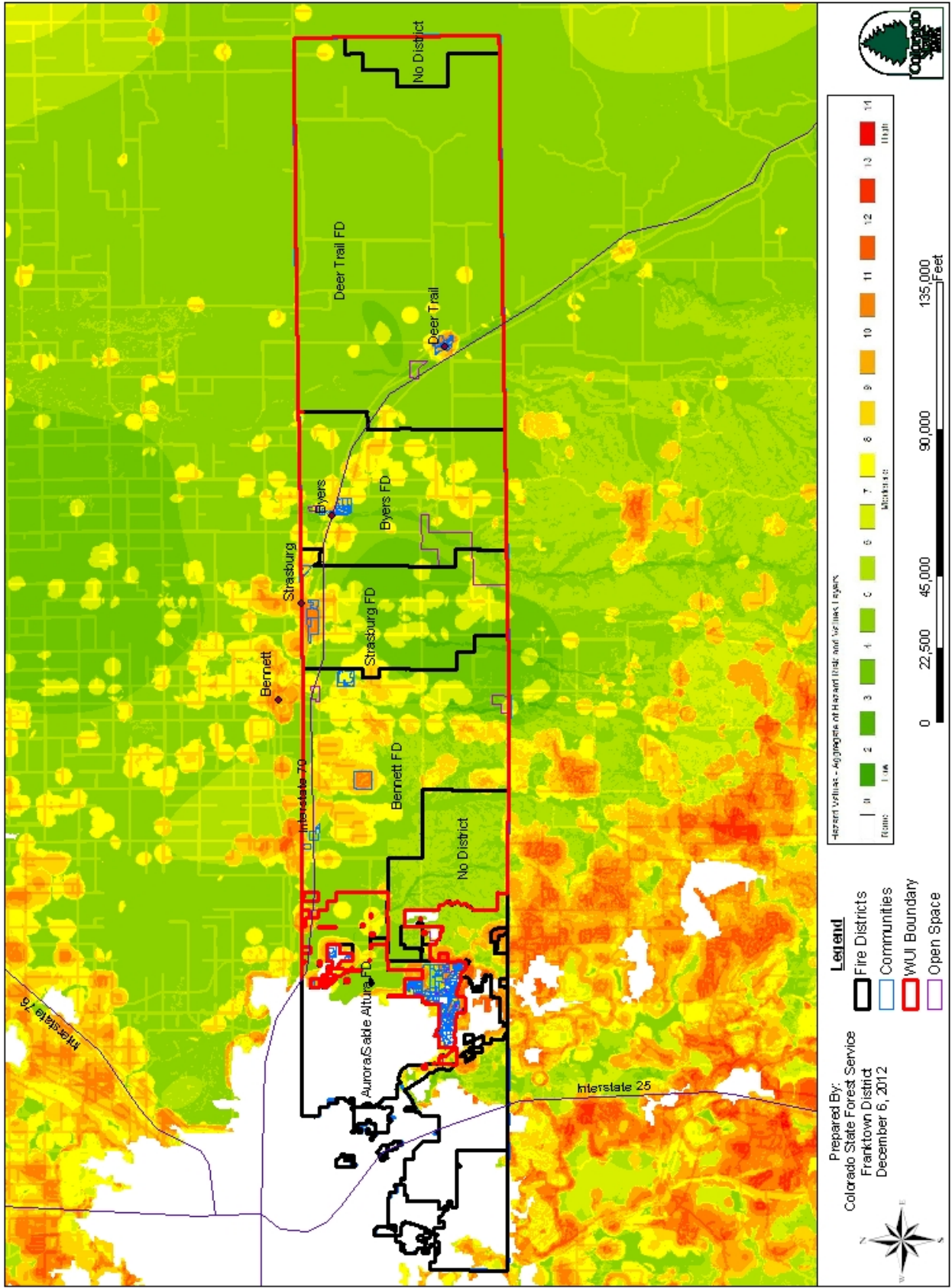
Appendix A – CDOW GAP Vegetation codes for Fuel Hazard and Disturbance Regime

PRIMARY	Description	Fuel Rank	Hazard	Disturbance Rank	Disturbance Regime
11001	Human Settlement type	0	none	0	n/a
21001	Dryland Crops type	1	low	4	short
21002	Irrigated Crop type	1	low	4	short
21003	Orchard/Horticulture type	1	low	4	short
21004	Confined Livestock Feeding type	0	none	0	n/a
31010	Tall-grass Prairie type	2	moderate	4	short
31013	Sand Dune Grassland Complex type	1	low	4	short
31020	Mid-grass Prairie type	2	moderate	4	short
31030	Short-grass Prairie type	1	low	4	short
31040	Foothill and Mountain Grasslands	1	low	4	short
32001	Mesic Upland Shrub type	2	moderate	4	short
32002	Xeric Upland Shrub type	2	moderate	4	short
32003	Deciduous oak type	4	very high	4	short
32005	Bitterbrush Shrub Steppe	2	moderate	4	short
32006	Mountain Big Sagebrush type	2	moderate	4	short
32007	Wyoming big sagebrush steppe type	2	moderate	4	short
32009	Big Sagebrush Shrubland type	2	moderate	4	short
32010	Desert Shrub type	1	low	4	short
32011	Saltbush Fans and Flats type	1	low	4	short
32012	Greasewood Fans and Flats type	2	moderate	4	short
32013	Sand Dune Complex Shrub type	1	low	4	short
32030	Disturbed Shrubland	1	low	4	short
41001	Aspen forest type	1	low	3	medium
42001	Spruce-fir type	3	high	1	very long
42002	Spruce-fir clearcut type	2	moderate	2	long
42003	Douglas fir Type	3	high	3	medium
42004	Lodgepole pine Type	3	high	2	long
42007	Lodgepole pine clearcut type	2	moderate	2	long
42009	Limber pine type	2	moderate	3	medium
42010	Ponderosa pine type	3	high	4	short
42011	Blue spruce type	2	moderate	2	long
42012	White fir type	3	high	3	medium
42015	Juniper woodland type	3	high	3	medium
42016	Pinyon/Juniper woodland type	4	very high	3	medium
42017	Rocky Mountain Bristlecone pine type	1	low	1	very long
42018	Mixed Conifer type	3	high	3	medium
43000	Mixed Forest type	2	moderate	4	short
52001	Open Water type	0	none	0	n/a
61001	Forest dominated wetland/riparian ty	1	low	3	medium
62001	Shrub-dominated Wetland/Riparian typ	2	moderate	4	short
62002	Graminoid-and forb-dominated wetland	1	low	4	short
70000	Barren land	0	none	0	n/a
71001	Unvegetated Playa type	0	none	0	n/a
71002	Bare soil (Non-playa)	0	none	0	n/a
73000	Sandy Areas other than beaches (Dune	0	none	0	n/a
74001	Exposed Rock type	0	none	0	n/a

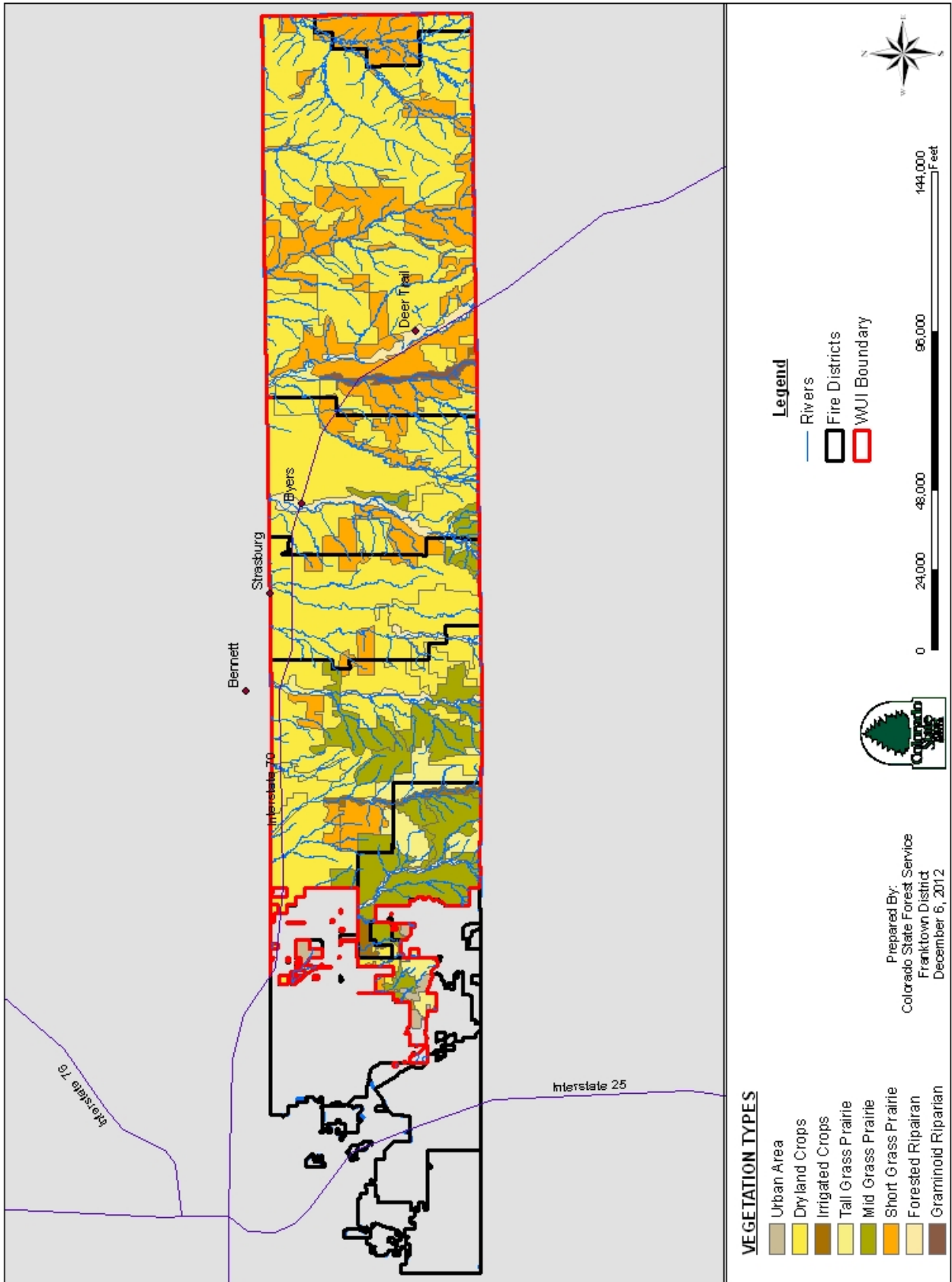
75001	Mining Operations	0	none	0	n/a
81001	Prostrate shrub tundra type	1	low	2	long
82001	Meadow Tundra Type (Above Upper Tree	1	low	1	very long
82002	Subalpine meadow type	1	low	3	medium
83000	Bare Tundra	1	low	1	very long
85000	Mixed Tundra	1	low	2	long

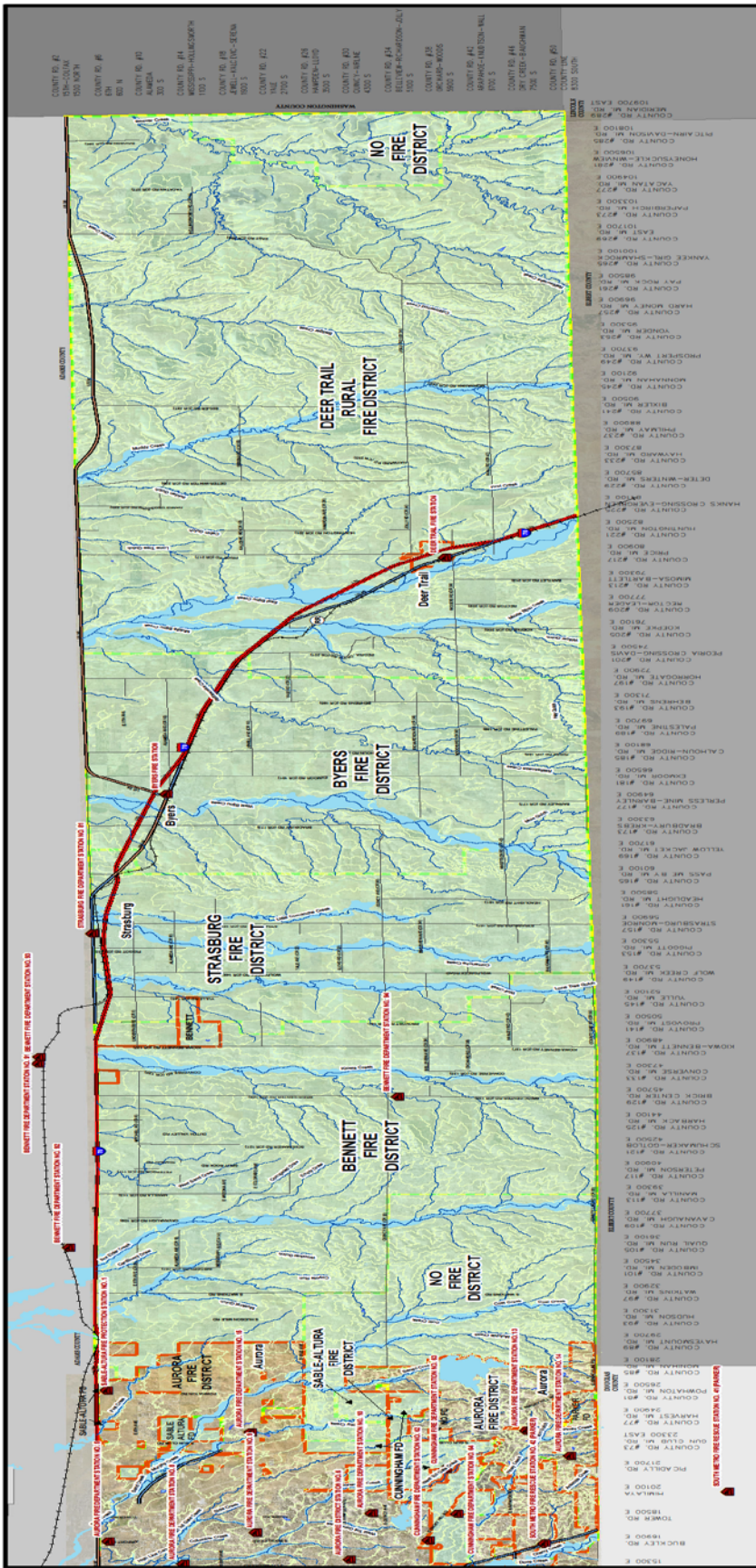
Appendix D: CWPP Maps

ARAPAHOE COUNTY CWPP WILDFIRE HAZARD MAP



ARAPAHOE COUNTY CWPP VEGETATION MAP





Arapahoe County Road & Railroad Hazard Map

- Railroads
- Streams
- Interstate
- US Highway
- State Highway
- County Road
- 50 Foot Contours

- Floodplain
- City Limits
- Fire District Boundary
- Arapahoe County Sheriff's Fire Area

Rural Fire Districts

for Arapahoe County, Colorado