MESA COUNTY

Mesa County Community Wildfire Protection Plan

March 2012

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MESA COUNTY
COMMUNITY WILDFIRE PROTECTION PLAN

Prepared for

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Executive Summary

For millennia fire has been an integral process in the maintenance of western ecosystems, but with the growth of communities into the wildland urban interface, fire is increasingly seen as a threat to life and property. In recent years a number of large fires have destroyed homes throughout the West, raising public awareness for the need to mitigate fire effects and plan for improving a community's resilience to this natural phenomenon.

This document has been developed to address wildfire threat to communities in Mesa County, Colorado, and it provides recommendations to abate catastrophic wildfire and minimize its impacts to communities. Mesa County is the fourth most extensive and the eleventh most populous of the Colorado counties and is named for its many large mesas. The county is made up of urban populations centered along the Interstate 70 corridor and the Colorado River, as well as a wide range of vegetation with associated range of fire hazards. Much of Mesa County's population has become fully aware of the prevalence of fire in these ecosystems, though some residents still perceive their communities to be at low risk of wildfire. The importance of public education and outreach in conjunction with recommended physical actions to reduce hazardous fuels are highlighted in this plan. Multi-jurisdictional agencies (federal, state, and local), organizations, and residents have joined together to develop this plan, the Mesa County Community Wildfire Protection Plan (MCCWPP).

The purpose of the MCCWPP is to assist in protecting human life and reducing property loss due to wildfire throughout Mesa County. The plan is the result of a community-wide wildland fire protection planning process and the compilation of documents, reports, and data developed by a wide array of contributors. This plan was compiled in 2011–2012 in response to the federal Healthy Forests Restoration Act (HFRA) of 2003.

The MCCWPP meets the requirements of the HFRA by:

1) Having been developed collaboratively by multiple agencies at the state and local levels in consultation with federal agencies and other interested parties.
2) Prioritizing and identifying fuel reduction treatments and recommending the types and methods of treatments to protect at-risk communities and pertinent infrastructure.
3) Suggesting multi-party mitigation, monitoring, and outreach.
4) Recommending measures and action items that residents and communities can take to reduce the ignitability of structures.
5) Facilitating public information meetings to educate and involve the community to participate in and contribute to the development of the MCCWPP.

The planning process has served to identify many physical hazards throughout Mesa County that could increase the threat of wildfire to communities. The public also has helped to identify community values that it would most like to see protected. By incorporating public and Core Team input into the recommendations, treatments are tailored specifically for Mesa County to be sensitive to local agricultural and ranching practices. The MCCWPP emphasizes the importance of collaboration among multi-jurisdictional agencies in order to develop fuels mitigation

treatment programs to address wildfire hazards. Mesa County has a committed team of career and volunteer firefighters, who work arduously to protect the life and property of Mesa County citizens, but without homeowners taking on some of the responsibility of reducing fire hazards in and around their own homes, these resources are severely stretched. A combination of homeowner and community awareness, public education, and agency collaboration and treatments are necessary to fully reduce wildfire risk. It is important to stress that this document is an initial step in educating the public and treating areas of concern, and should serve as a tool in doing so. The MCCWPP should be treated as a *live document* to be updated approximately every two years. The plan should be revised to reflect changes, modifications, or new information that may contribute to an updated MCCWPP. These elements are essential to the success of mitigating wildfire risk throughout Mesa County and will be important in maintaining the ideas and priorities of the plan and the communities in the future.

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List of Acronyms

°C	degrees Celsius
°F	degrees Fahrenheit
AOP	Annual Operating Plan
ATV	all-terrain vehicle
BAER	Burned Area Emergency Rehabilitation
BLM	Bureau of Land Management
BTU/ft/sec	British Thermal Units per feet, per second
CDNR	Colorado Department of Natural Resources
ch/h	chains per hour
CIG	Conservation Innovation Grants
County	Mesa County
C.R.S.	Colorado Revised Statute
CSFS	Colorado State Forest Service
CSU	Colorado State University
CVAR	Community Value at Risk
CWPP	Community Wildfire Protection Plan
DHS	Department of Homeland Security
EA	Environmental Assessment
EFF	Emergency Fire Fun
EQIP	Environmental Quality Incentives Program
FEMA	Federal Emergency Management Agency
FIREMON	Fire Effects Monitoring and Inventory System
FP&S	Fire Prevention and Safety Grants
FRI	fire-return intervals
GIS	geographic information system
GMMD	Grand Mesa Metropolitan District #1
gpm	gallons per minute
GOCO	Great Outdoors Colorado
HFRA	Healthy Forests Restoration Act
HIZ	Home Ignition Zone
I-70	Interstate 70
IGA	Intergovernmental Agreement
JPA	Joint Powers Agreement
MCCWPP	Mesa County Community Wildfire Protection Plan
MOU	Memorandum of Agreement
NEPA	National Environmental Policy Act
NFDRS	National Fire Danger Rating System
NFP	National Fire Plan
NFPA	National Fire Protection Association
NIFC	National Interagency Fire Center
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWGC	National Wildfire Coordinating Group
PPE	personal protective equipment
PVFPD	Plateau Valley Fire Protection District

RAW	remote automated weather
SAF	Society of American Foresters
SAFER	Staffing for Adequate Fire and Emergency Response
SFA	State Fire Assistance
SWA	State Wildlife Area
SWCA	SWCA Environmental Consultants
UCR	Upper Colorado River Fire Management Unit
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFS	U.S. Forest Service
VFD	volunteer fire department
WCCC	Western Colorado Conservation Corps
WERF	Wildfire Emergency Response Fund
WRCC	Western Regional Climate Center
WUI	Wildland Urban Interface

1.0 INTRODUCTION

With increasing frequency, the national news media report tragic stories of communities impacted in the latest wave of severe wildfire. In order to mitigate fire impacts, communities in fire-prone environments need to have a plan to prepare for, reduce the risk of, and adapt to wildland fire events. Community Wildfire Protection Plans (CWPPs) help accomplish these goals. A CWPP provides recommendations that are intended to reduce, but not eliminate, the extreme severity or risk of wildland fire.

This CWPP, entitled the Mesa County CWPP (MCCWPP), is a countywide plan that evaluates wildfire threat to communities and infrastructure and identifies measures that homeowners, land managers, and fire departments can take to reduce the impact of wildfire to life, property, and other community values at risk (CVARs). The plan provides background information, a risk assessment, and recommendations. Section 1 provides an overview of CWPPs and describes Mesa County's (hereafter referred to as the County) need for a plan, Section 2 provides demographic and background information about the County, Section 3 gives an overview of the fire environment, Section 4 describes the methodology for the risk assessment and the results in detail, and Section 5 provides recommendations that incorporate action plans for reducing fuels, initiating public education and outreach, reducing structural ignitability, and improving fire response capabilities. The MCCWPP does not require implementation of any of the recommendations; however, these recommendations may be used as guidelines for the implementation process if funding opportunities become available. The recommendations for fuels reduction projects are general in nature, meaning site-specific planning that addresses location, access, land ownership, topography, soils, and fuels would need to be employed upon implementation. Also, it is important to note that the recommendations are specific to wildland urban interface (WUI) areas and are expected to reduce the loss of life and property. Recommendations for the restoration of ecosystems and the role that fire plays in ecosystems are distinct from recommendations for WUI areas and are not addressed in detail in this plan.

1.1 OVERVIEW OF COMMUNITY WILDFIRE PROTECTION PLANS

In response to a landmark fire season in 2000, the National Fire Plan (NFP) was established to develop a collaborative approach among various governmental agencies to actively respond to severe wildland fires and ensure sufficient firefighting capacity for the future. The NFP was followed by a report in 2001, entitled *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-year Comprehensive Strategy*, which was updated in 2002 to include an implementation plan. This plan was updated once more in 2006, with a similar focus on using a collaborative framework for restoring fire-adapted ecosystems, reducing hazardous fuels, mitigating risks to communities, providing economic benefits, and improving fire prevention and suppression strategies. The 2006 implementation plan also emphasizes information sharing and monitoring of accomplishments and forest conditions, a long-term commitment to maintaining the essential resources for implementation, a landscape-level vision for restoration of fire-adapted ecosystems, the importance of using fire as a management tool, and continued improvements to collaboration efforts (Western Governors' Association 2006). Progress reports and lessons learned reports for community fire prevention are provided annually (Western Governors' Association 2010).

In 2003 the U.S. Congress recognized widespread declining forest health by passing the Healthy Forests Restoration Act (HFRA), and President Bush signed the act into law (Public Law 108–148, 2003). The HFRA was revised in 2009 to address changes to funding and provide a renewed focus on wildfire mitigation (H.R.4233 - Healthy Forest Restoration Amendments Act of 2009). The HFRA expedites the development and implementation of hazardous fuels reduction projects on federal land and emphasizes the need for federal agencies to work collaboratively with communities. A key component of the HFRA is the development of CWPPs, which facilitates the collaboration between federal agencies and communities in order to develop hazardous fuels reduction projects and place priority on treatment areas identified by communities in a CWPP. A CWPP also allows communities to establish their own definition of the WUI. In addition, communities with an established CWPP are given priority for funding of hazardous fuels reduction projects carried out in accordance with the HFRA.

Although the HFRA and the specific guidelines are new, the principles behind the CWPP program are not. The NFP and State Fire Plans, the Western Governors' 10-Year Comprehensive Strategy, and the Federal Emergency Management Agency (FEMA) Disaster Mitigation Act of 2000 all mandate community-based planning efforts with full stakeholder participation, coordination, project identification, prioritization, funding review, and multi-agency cooperation.

1.2 NEED FOR CWPPS

The County is made up of a rural and urban mix, with agricultural land and lowland valleys, juxtaposed with mesas and canyons, pinyon-juniper woodlands, and high elevation mixed conifer forests. The majority of the population lives in the municipal areas of Grand Junction, Fruita, Palisade, De Beque, Clifton, Gateway, and Collbran, with scattered ranches and homes in a number of unincorporated communities like Glade Park. These communities are served by municipal and volunteer fire departments (VFDs) and emergency response staff. While the majority of the population lives in areas that do not exhibit the typical characteristics of communities that are highly prone to fire, such as dense timber, these rural grassland, xeric shrub, and pinyon-juniper woodland communities are still extremely prone to high-severity wildland fire. Although fire services are well developed in the County, particularly when compared to surrounding counties, some communities are still poorly prepared for potentially large-scale fires. Sadly, catastrophic losses have occurred recently throughout western areas because communities have been ill-equipped to mitigate or respond effectively to fires.

1.3 GOAL OF CWPPS

A CWPP enables local communities to improve their wildfire mitigation capacity and work with government agencies to identify high fire risk areas and prioritize areas for mitigation, fire suppression, and emergency preparedness. The minimum requirements for a CWPP, as stated in the HFRA, are as follows:

1. **Collaboration:** Local and state government representatives, in consultation with federal agencies or other interested groups, must collaboratively develop a CWPP (Society of American Foresters [SAF] 2004).
2. **Prioritized Fuel Reduction:** A CWPP must identify and prioritize areas for hazardous fuels reduction and treatments; furthermore, the plan must recommend the types and

methods of treatment that will protect at-risk communities and their essential infrastructures (SAF 2004).

3. **Treatments of Structural Ignitability:** A CWPP must recommend measures that communities and homeowners can take to reduce the ignitability of structures throughout the area addressed by the plan (SAF 2004).

Colorado Senate Bill 09-001, "Concerning the Establishment of Community Wildfire Protection Plans by County Governments," requires each county government to prepare a CWPP to "clarify and refine its priorities for the protection of life, property and critical infrastructure in its wildland urban interface area." The *Colorado State Forest Service Minimum Standards for a CWPP* (Colorado State Forest Service [CSFS] 2009) per the Colorado Senate Bill 09-001 define that a CWPP must include:

1. A definition of the community's WUI, outlined on a map with an accompanying narrative.
2. Identification of adjacent landowners.
3. A community risk analysis.
4. A discussion of community preparedness to respond to wildland fire.
5. An implementation plan that includes:
    a. The type of treatment recommended;
    b. Suggested or preferred method of treatment;
    c. A project area map illustrating proposed treatments; and
    d. A narrative or table that details the relative priority of each project.

The MCCWPP addresses all the requirements for completion of a CWPP outlined in the HFRA and by the CSFS, paying special attention to the desires and needs of the communities and multiple jurisdictions throughout the planning area. Goals specific to this CWPP are listed below:

- Provide for public and firefighter safety at all times;
- Reduce the threat of wildland fire to communities in the WUI;
- Protect all CVAR of wildfire; and
- Move plant communities towards a more natural fire regime wherever possible and reduce the invasion of exotic species.

1.4 PLANNING PROCESS

The SAF, in collaboration with the National Association of Counties, the National Association of State Foresters, the Western Governors' Association, and the Communities Committee, developed a guide entitled *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities* (SAF 2004) to provide communities with a clear process to use in developing a CWPP. The guide outlines eight steps for developing a CWPP and has been followed in preparing the MCCWPP:

Step One: Convene Decision-makers. Form a Core Team made up of representatives from the appropriate local governments, local fire authorities, and state agencies responsible for forest management.

Step Two: Involve Federal Agencies. Identify and engage local representatives of the U.S. Forest Service (USFS), Bureau of Land Management (BLM) and National Park Service (NPS). Contact and involve other land management agencies as appropriate.

Step Three: Engage Interested Parties. Contact and encourage active involvement in plan development from a broad range of interested organizations and stakeholders.

Step Four: Establish a Community Base Map. Work with partners to establish a base map(s) defining the community's WUI and showing inhabited areas at risk, wildland areas that contain critical human infrastructure, and wildland areas at risk for large-scale fire disturbance. (Please see Appendix A for a series of base maps that informed the final risk assessment.)

Step Five: Develop a Community Risk Assessment. Work with partners to develop a community risk assessment that considers fuel hazards; risk of wildfire occurrence; homes, businesses, and essential infrastructure at risk; other CVARs; and local preparedness capability. Rate the level of risk for each factor and incorporate this information into the base map as appropriate.

Step Six: Establish Community Priorities and Recommendations. Use the base map and community risk assessment to facilitate a collaborative community discussion that leads to the identification of local priorities for treating fuels, reducing structural ignitability, and other issues of interest, such as improving fire response capability. Clearly indicate whether priority projects are directly related to protection of communities and essential infrastructure or to reducing wildfire risks to other community values.

Step Seven: Develop an Action Plan and Assessment Strategy. Consider developing a detailed implementation strategy to accompany the CWPP, as well as a monitoring plan that will ensure its long-term success.

Step Eight: Finalize Community Wildfire Protection Plan. Finalize the CWPP and communicate the results to community and key partners.

1.5 CORE TEAM

The first step in the CWPP process was to bring together a broad group of stakeholders representing both agency and private interests to form a Core Team. An extensive distribution

list (Appendix B) was developed to invite as many stakeholders to join the Core Team as possible. The first Core Team meeting was held on November 14, 2011, a second meeting was held on January 26, 2012, and the final meeting was on March 2, 2012. Average attendance at Core Team meetings was approximately 10 people.

1.6 PROJECT AREA

This CWPP is a countywide plan, so the planning area boundary coincides with the County boundary (Figure 1.1). The community assessments are carried out and described here by fire district. Two of the fire districts (De Beque and Lower Valley) extend into Garfield County and because Garfield was already developing a CWPP, the Core Team agreed that areas outside the County would not be assessed in this CWPP.

Figure 1.1. Project location map.

1.7 PUBLIC INVOLVEMENT

Engaging interested parties is critical in the CWPP process; substantive input from the public will ensure that the final document reflects the highest priorities of the local community. A key element in the CWPP process is the meaningful discussions it generates among community members regarding their priorities for local fire protection and forest management (SAF 2004).

Public involvement in the CWPP planning process was encouraged through a range of media. A Facebook page was developed for the County (entitled Mesa County Community Wildfire Protection Plan), to which more than 30 people linked to the profile and the page had more than 100 views. The page included a description of the planning process and included links to an online community survey and other relevant pages for the County. The page was also used to announce two public meetings to gather input on the plan. The online survey was also distributed to all County employees and made available on the County website. Paper copies were distributed at both public meetings and to the Core Team. Flyers advertising the meetings were produced and distributed by the Core Team. Informational flyers were also distributed at the public meetings, providing information on the planning process and outreach efforts.

The public involvement process was launched through a press release by the Mesa County Sheriff's Department and the CSFS. Emergency Manager Andy Martsolf also made a radio announcement on the local radio station (KJOL), discussing fire preparedness, the CWPP, and public outreach efforts. In addition, KREX News Channel 5 aired a news story on January 26, 2012, regarding the CWPP outreach efforts and fire risk in the County, in which reporters visited a high risk community and spoke with Deputy Fire Warden John Coleman. The public meeting times and locations were posted in the *Daily Sentinel* and were announced on other local news networks.

Two public meetings were held to gather information from the public regarding wildfire on private and public lands. The first meeting was held on January 26, 2012, and was incorporated into the community meeting for Glade Park residents. This meeting was chosen because it attracts a large number of residents from Glade Park, an area of particularly high fire risk. Members of the Core Team attended the meeting and SWCA Environmental Consultants (SWCA) made an announcement regarding the planning process and introduced the concept of a CWPP. SWCA discussed the main themes that came out of assessments in Glade Park, particularly the need for defensible space around homes in pinyon-juniper dominated environments, then provided ways in which the public could provide its input, through the survey, Facebook, and handouts provided to residents. Members of the public reviewed a draft risk assessment map and identified particular hazard areas to the Core Team.

The second meeting was held at Wingate Elementary School on January 27, 2012. The meeting was a traditional format with a PowerPoint presentation session and then an open forum. SWCA presented general information about CWPPs and their goals and objectives, as well as the stages in the planning process. The presentation contained information relating to the geographic information system (GIS) risk assessments and some of the key findings from the field assessments, as well as example recommendations to mitigate risk. The presentation ended with a discussion regarding defensible space practices in the County. Following the SWCA presentation, the BLM presented information regarding fuel treatments on public lands in the

County, including a discussion of the techniques used for thinning and burning. This presentation was followed by an announcement by the CSFS regarding cost share funding for defensible space treatments on private land. Accompanying these presentations was literature providing additional detail on federal and state programs for fire prevention. Following the presentation the audience was asked to provide feedback on fire risk concerns on private and public lands. Attendees were particularly concerned about hazardous fuels on public lands adjacent to their homes. In addition many questions centered on funding for defensible space and improving water supplies. Detailed comments from the public meetings are provided in Appendix C.

2.0 MESA COUNTY BACKGROUND

2.1 LOCATION AND GEOGRAPHY

Mesa County is located in central-western Colorado. The County boundary defines the MCCWPP planning area, which includes multiple cities, towns, communities, and roadways. The largest city is Grand Junction, which is also the County seat. Overall, the County is highly rural and contains a large amount of agricultural land. Approximately 80% of the land in the County is federally managed by the BLM, the USFS, and the NPS, collectively, with the remainder privately held or state managed (Figure 2.1).

The County is named for its mesas and has a total area of 3,341.11 square miles, of which 3,327.75 square miles (or 99.60%) is land and 13.36 square miles (or 0.40%) is water (U.S. Census Bureau 2012). Mesa County exhibits extremely diverse topography, from the High Desert of the Grand Valley, a major fruit-growing region around Grand Junction, which sits at 4,597 feet in elevation, to the impressive Grand Mesa, which rises to an average elevation of 11,000 feet with a maximum elevation at Crater Peak at 11,333 feet. Major physiographic features are the Colorado River and its tributaries, including the Gunnison and Dolores rivers; the Uncompahgre Plateau, dissected by Unaweep Canyon; Grand Mesa; and the Grand Valley. Grand Junction is situated along the Colorado River where it meets the Gunnison River from the south. To the west of Grand Junction are the canyons and mesas that make up the Colorado National Monument, and to the north are the prominent Book Cliffs.

The main transportation corridors through the planning area are Interstate 70 (I-70), which crosses the County in the northwest portion; U.S. Highway 50, which diverges from I-70 at Grand Junction and heads southeast; Colorado Highway 330, which crosses the northeast portion; and Colorado Highway 140, which crosses the south portion. Several other state highways and a network of county roads also serve as transportation corridors throughout the County.

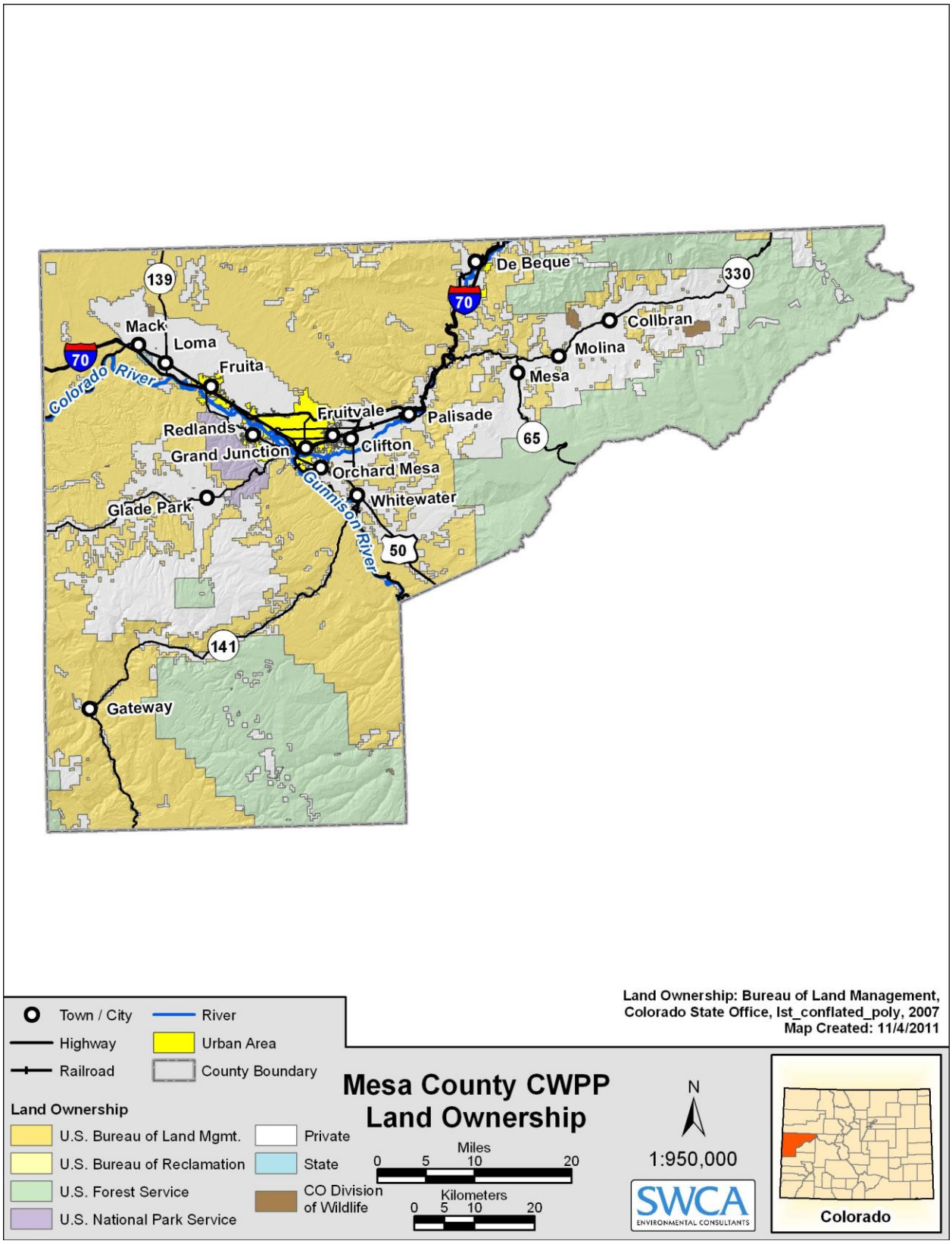


Figure 2.1. Mesa County land ownership.

2.2 POPULATION

In 2010, the population of Mesa County was approximately 146,723 and represented 2.92% of the population of Colorado. This amounted to 44.1 people per square mile. Populations in the County have grown over the past several years and continue to grow. The County experienced a population increase of about 26.2% from 2000 to 2010 (U.S. Census Bureau 2011a), which was greater than the population growth for the state of Colorado overall, at 16.9% growth for the same period (U.S. Census Bureau 2011a).

The largest city in Mesa County is Grand Junction, followed by Fruita and Palisade. Grand Junction had a total population of 58,566 in 2010. The city of Fruita had a total population of 12,646 in 2010. The town of Palisade had a total population of 2,692 (U.S. Census Bureau 2011a, 2011b). Other incorporated towns include Collbran and De Beque, and unincorporated areas of the County include Clifton, Fruitvale, Mesa, Mack, Loma, Gateway, Glade Park, and Whitewater. The U.S. Census Bureau regards Grand Junction, Fruita, Collbran, De Beque, and Palisade, and all unincorporated areas of Mesa County as the Grand Junction Metropolitan Statistical Area. Therefore, census data were not available for some of the unincorporated towns. The information that was available is included in Table 2.1.

Table 2.1. Census Summary for Mesa County

Place Name	Place Type	Population	Housing Units
Collbran	Town	708	221
De Beque	Town	504	222
Clifton	Census-Designated Place	19,889	7,715
Fruitvale	Census-Designated Place	7,675	3,149
Loma	Unincorporated Town	1,293	478
Glade Park-Gateway	Census-County Division	2,187	1,153

Source: U.S. Census Bureau 2011b.

As of the 2010 Census, there were approximately 62,644 occupied housing units in Mesa County (U.S. Census Bureau 2011a). The city of Grand Junction had 26,170 housing units and a housing density of 841.5 housing units per square mile. The city of Fruita had 5,069 housing units and a housing density of 844.8 housing units per square mile. The town of Palisade had 1,274 housing units and a housing density of 1,158.2 housing units per square mile (U.S. Census Bureau 2011b). The most populated unincorporated areas, Clifton and Fruitvale, have housing densities of 1,285.8 and 1,082.1 housing units per square mile, respectively. Overall, housing characteristics seem to be concentrated in the populated areas with expansive rural areas between towns. Mesa County Climate

Mesa County residents experience a mild climate with mild winter temperatures and low year round humidity; Grand Junction averages a January high and low of 37.9 degrees Fahrenheit (°F) (3.3 degrees Celsius [°C]) and 16.8°F (−8.4°C), respectively (Figure 2.2), and a light snowfall with a 30-year average of 13.8 inches and a median of 6.3 inches. Snow is greatest in December and January. Spring warming is gradual (see Figure 2.2), but summers are often hot and dry, with average July highs reaching 93°F (33.9°C) and lows reaching 64°F (17.8°C) (Western Regional Climate Center [WRCC] 2012). Grand Junction averages at least 64 days a year with

temperatures at 90°F (32.2°C) or above, and at least five days with 100°F (37.8°C) or more (WRCC 2012). Autumn cooling is rapid, with freezes usually beginning in mid-October. The Grand Junction area receives little precipitation year-round, averaging 9.06 inches. Higher elevation areas in the County are known for their cooler and wetter climate. Grand Mesa, for example, receives 32 inches of mean annual precipitation and 220 inches of snowfall (WRCC 2012). The January high and low recorded at Mesa Lakes Resort are 27.9°F (−2.27°C) and 3.4°F (−16.0°C), respectively. Summer temperatures are at their highest in July with a high and low of 69.2°F (20.6°C) and 43°F (6.1°C), respectively (WRCC 2012).

Precipitation west of the Continental Divide is more evenly distributed throughout the year than in the eastern plains. For most of the County, the greatest monthly precipitation occurs in August and during late summer, while June is the driest month (Figure 2.3). The County boasts abundant sunshine even in winter, with just over 3,200 hours per year.

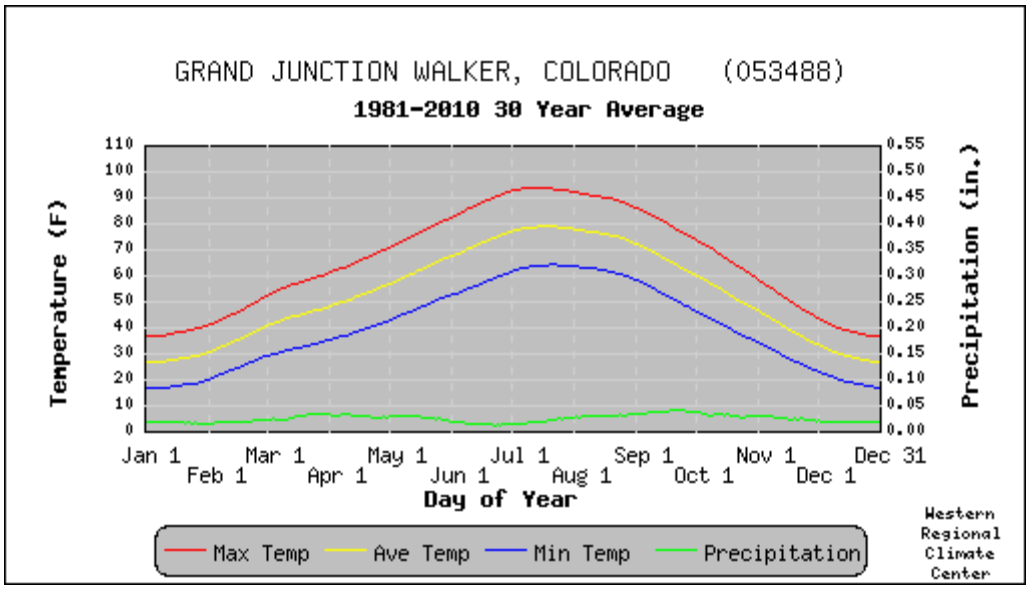


Figure 2.2. Daily temperature averages and extremes in Grand Junction (WRCC 2012).

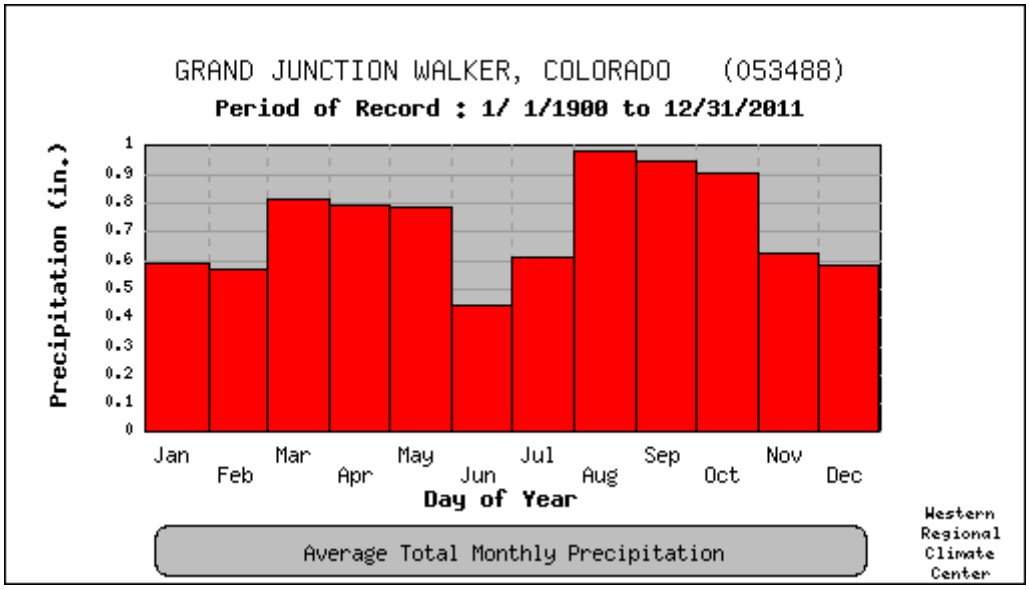


Figure 2.3. Monthly average total precipitation for Grand Junction (WRCC 2012).

2.3 VEGETATION

Vegetation is variable across the County (Table 2.2). The most dominant vegetation type is Colorado Plateau pinyon-juniper woodlands, making up over 28% of the land cover and dominating slopes from 4,600 to 8,900 feet (Colorado Department of Natural Resources [CDNR] 2003). Shrublands are the next most dominant land cover, found at the lowest elevations and throughout the Grand Valley; blackbrush (*Coleogyne ramosissima*), fourwing saltbush (*Atriplex canescens*), big sagebrush (*Artemisia tridentata*), and greasewood shrub (*Sarcobatus vermiculatus*) are dominant species. Sagebrush is common on deep, well-drained soils that make up the valley bottoms and mesas. Dominant species include basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), mountain big sagebrush (*A. t.* ssp. *vaseyana*), black sagebrush (*A. nova*), and silver sagebrush (*A. cana*). These sagebrush communities are vulnerable to cheatgrass (*Bromus tectorum*) invasion after fire or heavy grazing (CDNR 2003). Higher elevations, from 7,000 to 8,500 feet, transition into Rocky Mountain ponderosa pine (*Pinus ponderosa*) woodlands, often with a thick Gambel oak (*Quercus gambelii*) understory. This community type occurs on the Uncompahgre Plateau, both north and south of Unaweep Canyon and on the Grand Mesa. Aspen forests are found at elevations from 7,200 to 10,200 feet in association with ponderosa pine or are dominant at upper elevations. Spruce-fir forests are found at the highest elevations often on National Forest lands. These forests typically have a closed canopy and sparse understory (CDNR 2003).

Wetland and riparian vegetation is the most threatened vegetation in Mesa County (CDNR 2003). Riparian areas are found throughout the County at all elevations. At the lowest elevations, Rio Grande cottonwood (*Populus deltoides* ssp. *wislizeni*) make up the overstories with thick shrub-dominated understories of willow (*Salix* sp.) and invasive saltcedar (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*). Above about 5,500 feet, Rio Grande cottonwood is replaced by narrowleaf cottonwood (*Populus angustifolia*). Common understory species at these elevations are various willows, red-osier dogwood (*Cornus sericea*), chokecherry (*Prunus virginiana*), and wild rose (*Rosa woodsii*) (CDNR 2003).

Table 2.2. Vegetation Types throughout Mesa County

Vegetation Type	Dominant Species	Acreage	% of Total
Western riparian woodland and shrubland	Cottonwood species, willow, saltcedar, Russian olive	51,713	2.418%
Herbaceous - introduced upland grass	Cheatgrass	108,711	5.083%
Agriculture	Cultivated land, row crops, orchards	106,496	4.980%
Spruce-fir forest and grassland	Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), Douglas-fir (*Pseudotsuga menziesii*)	132,448	6.193%
Southern Rocky Mountain ponderosa pine woodland	Ponderosa pine, lodgepole pine (*Pinus contorta*), limber pine (*P. flexilis*)	55,577	2.599%
Deciduous woodlands	Rocky Mountain aspen (*Populus* sp.), Gambel oak	385,676	18.034%
Shrubland	Blackbrush, fourwing saltbush, big sagebrush, greasewood shrub	277,818	12.990%
Inter-mountain basin, montane sagebrush steppe	Big sagebrush	288,871	13.507%
Montane-subalpine grassland	Herbaceous, non-vascular dominated grassland	15,319	0.716%

Vegetation Type	Dominant Species	Acreage	% of Total
Colorado Plateau pinyon-juniper woodlands	Pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), oneseed juniper (*J. monosperma*), and Rocky Mountain juniper (*J. scopulorum*)	604,484	28.265%
Inter-mountain basin, semi-desert grassland	Grama-galetta (*Bouteloua-Pleuraphis* sp.) grasses	26,658	1.247%
Open water	Lakes, rivers	7,164	0.335%
Developed	Urban	47,191	2.207%
Barren	Non-vegetated	28,285	1.323%
Sparsely vegetated	No dominant life form	2,214	0.104%

Source: LANDFIRE 2012.

2.3.1 Agriculture—Cultivated Crops and Irrigated Agriculture

Mesa County is renowned for its abundant orchards and vineyards (Figure 2.4), and agriculture has been a way of life and has benefited residents of the County for generations. Agriculture is an important component of the economy and adds intrinsic value to life in Mesa County. The main crops grown in the County are corn, winter wheat, hay, peaches, apricots, grapes, and hops. Livestock production is also a major agricultural land use.

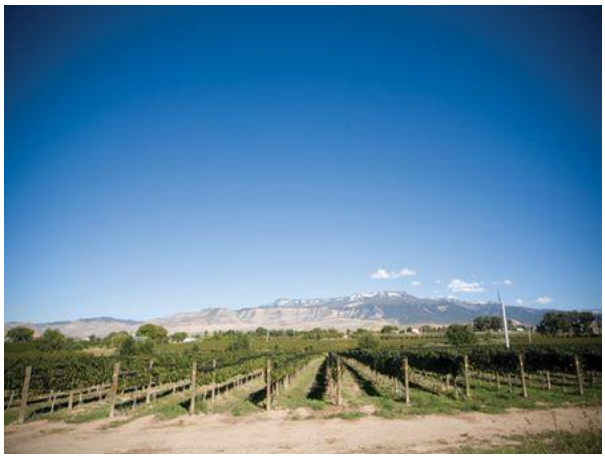


Figure 2.4. Mesa County vineyard.

2.4 Historic Conditions and Present Changes in Fire-Adapted Ecosystems

During the past few centuries, humans have altered the fire-adapted ecosystem in western Colorado. Prior to 1900, periodic, low-intensity surface fires burned through much of the landscape. This process reduced fuel loads by removing dense brush cover and encroachments of small trees. Thus, in the past, these fire-adapted ecosystems were routinely renewed, which supported healthy ecosystems.

Prior to European settlement, fire ignited by various Native American groups and lightning-caused fires were common and removed encroaching shrubs, forbs, and trees and promoted vigorous grassland vegetation (Pyne 1982). Juniper savannas and pinyon-juniper woodlands

have also changed over time and have expanded above their historic range and densities as a result of livestock grazing, fire suppression, and climatic variation (Allen and Breshears 1998; Swetnam et al. 1999).

2.4.1 Non-native and Invasive Species

Fire-tolerant, flammable, non-native species now exist within cottonwood (*Populus* sp.) and willow stands along the Colorado River corridor and other rivers and drainages throughout the County. One species that deserves special mention with regard to wildfire is the non-native phreatophyte saltcedar. This species, also referred to as tamarisk, is common along nearly all riparian areas within the MCCWPP planning area.

Saltcedar and Russian Olive

Programs to reduce saltcedar have already been implemented in the County, including the activities of the Tamarisk Coalition. In Grand Junction, the Tamarisk Coalition has been working with the city to restore an 81-acre site just upstream from the confluence of the Colorado and Gunnison rivers known as Watson Island. This site is located along the riverfront trail, adjacent to the Western Colorado Botanical Gardens and butterfly house. Restoration efforts have been ongoing since 2003. To date approximately 67 acres of saltcedar and/or Russian olive have been removed via various methods, including bulldozer land clearing, mechanical mulching, and cut-stump with herbicide application. Restoration efforts include secondary weed control (kochia [*Bassia scoparia*], Russian knapweed [*Acroptilon repens*], perennial pepperweed [*Lepidium latifolium*], and Russian thistle [*Salsola kali*]), native riparian and upland grass seeding, upland and riparian shrub plantings, and woody riparian pole plantings. Goals for the project are to enhance ecological health, visitor experience, and wildlife habitat.

In Fruita, the Tamarisk Coalition has been working with the city to control saltcedar and Russian olive on a 20-acre site on the southwest corner of Colorado State Highway 340 and the Colorado River known as Fruita Riverfront Park or Kingsview Open Space. Over the past two years this site has been transformed from a saltcedar and Russian olive infested floodplain to an open river terrace with an 18-hole disc golf course. Removal techniques have included cut-stump with herbicide and mechanical mulching with follow-up herbicide. Revegetation is ongoing via broadcast seeding of native grasses and shrubs. There are an additional 15 acres just downstream from Riverfront Park known as Snooks Bottom, which the Tamarisk Coalition and the City of Fruita are working together to secure funding for future saltcedar and Russian olive control and restoration efforts. Management goals for these projects are to increase access and usability for visitor recreation and relaxation while improving ecological health and wildlife habitat (Figure 2.5).

Figure 2.5. Saltcedar in Mesa County.

Native cottonwood trees and willows are not fire adapted and thus are less capable of recovering from the effects of fire than non-native saltcedar and Russian olive (*Elaeagnus angustifolia*) (Stromberg et al. 2002). Extensive fires in riparian areas could result in further shifts away from diverse mesic native plant communities to more xeric non-native woodlands and shrublands. Multiple human-caused fires have burned cottonwood galleries along the Colorado River in the County. These fires have spread in part due to dense stands of saltcedar.

Once established, saltcedar can obtain water at deeper groundwater levels and has higher water-use efficiency than native riparian trees in both mature and post-fire communities (Busch and Smith 1993; Busch 1995). One of the major competitive advantages of saltcedar is its ability to sprout from the root crown following fire or other disturbances (e.g., flood, herbicides) that kill or severely injure aboveground portions of the plant (Brotherson and Winkel 1986; Brotherson and Field 1987; Smith et al. 1998). Saltcedar flammability increases with the buildup of dead and senescent woody material within the dense bases of the plant (Busch 1995). The species can also contribute to increased canopy density, which creates volatile fuel ladders and increases the likelihood of wildfire. Other non-native species, such as Russian olive and Siberian elm (*Ulmus pumila*), also exist along the river corridors and have created similar problems, although not as extensive, to those created by saltcedar.

Cheatgrass

Infestation of cheatgrass in the County is a particular concern for land managers. Invasion of cheatgrass can increase the frequency of fire to the point that native shrub species cannot recover, giving cheatgrass a further competitive advantage (Brooks et al. 2004). Cheatgrass is prevalent throughout the County, both along roadsides and disturbed areas, but also as a dominant species in undisturbed grassland communities in wildland areas and around homes in the WUI. A number of studies have been completed on the Uncompahgre Plateau that have found cheatgrass to flourish in these semiarid environments, particularly in recently burned areas (Shinneman 2006; Getz and Baker 2008). Once established the species is especially hard to control; it alters native plant communities and displaces native plants. Cheatgrass is highly flammable and densely growing populations provide ample, fine-textured fuels that increase fire intensity and often decrease intervals between fires (Colorado State University [CSU] 2012). Cheatgrass is an early season grass that dies back in early summer leaving a thick continuous fuel bed that is prone to rapid fire spread.

Because cheatgrass is hard to eradicate, recommendations for fire mitigation include reducing the potential for ignition of grasslands that are dominated by cheatgrass. This includes using spark arresters on agricultural equipment, disposing of lit cigarettes properly, and keeping vehicles to well maintained roads at all times when in cheatgrass infested areas (CSU 2012). Removal or control of cheatgrass is also recommended around homes as part of defensible space treatments for fire prevention. Cheatgrass should be removed within 30 feet of the home by mowing or hand pulling or application of chemical formulas such as Roundup or Plateau, following manufacturers guidelines. Maintenance of the treated area is essential to ensure control of the species over the long term.

2.5 HISTORY AND LAND USE

In ancient times western Colorado was a floodplain with a humid climate. It was home to dinosaurs, which is evidenced by the paleological resources in the area. The first known human inhabitants were the Fremont Indians that lived from 250 to 1300 A.D. The Fremonts were hunters, farmers, and artists (Mesa County 2004). In the 1800s this area was home to the Northern Ute Tribe, and Ute Chief Ouray was a revered leader. Two traveling Spanish friars named many of the region's mountains and rivers (the Dominguez and Escalante canyons area—named after the friars—became a National Conservation Area in 2009). The discovery of gold and silver drew prospectors, and towns were founded to meet the needs of miners and their families (Mesa County 2004).

Grand Junction, the County's biggest city, has a strong history that dates back more than 125 years. In the 1880s, the area was part of the Northern Ute Reservation, although the Native Americans were later moved west into Utah. In September 1881, the area experienced a land rush settlement and a townsite was staked. This town, located in the Grand Valley, was first called Ute, then West Denver, and finally came to be known as Grand Junction. The name stems from of its location at the confluence—or junction—of the Gunnison and Colorado rivers (the Colorado was historically called the "Grand River") (Mesa County 2004). By 1883, Mesa County was created from neighboring counties, and Grand Junction was named the County seat. Grand Junction began to thrive when the main line of the Denver and Rio Grande Railroad came into the area in 1887. Soon after, major irrigation turned the Grand Valley into a fertile agricultural area (Mesa County 2004). Mesa County was named for the many mesas in the area, including Grand Mesa, which is the most extensive mesa on Earth.

Grand Junction is now home to a number of light manufacturing and service industries, three hospitals, a regional airport, and a number of recreational opportunities.

3.0 FIRE ENVIRONMENT

3.1 WILDLAND URBAN INTERFACE

The WUI is composed of both interface and intermix communities and is defined as areas where human habitation and development meet or intermix with wildland fuels (U.S. Department of the Interior [USDI] and U.S. Department of Agriculture [USDA] 2001:752–753). Interface areas include housing developments that meet or are in the vicinity of continuous vegetation and consist of less than 50% vegetation. Intermix areas are those areas where structures are scattered throughout a wildland area of greater than 50% continuous vegetation and fuels and meet or exceed a minimum of one house per 40 acres. Depending on the surrounding fuel conditions, topography, and present structures, wildland areas of up to 1.5 miles from structures may be included in the WUI (Stewart et al. 2007).

The WUI creates an environment in which fire can move readily between structural and vegetative fuels, increasing the potential for wildland fire ignitions and the corresponding potential loss of life and property. Human encroachment upon wildland ecosystems within recent decades is increasing the extent of the WUI and is therefore having a significant influence on wildland fire management practices. Combined with the collective effects of past fire management policies, resource management practices, land use patterns, climate change, and insect and disease infestations, the expansion of the WUI into areas with high fire risk has created an urgent need to modify fire management practices and policies and to understand and manage fire risk effectively in the WUI (Pyne 2001; Stephens and Ruth 2005). Mitigation techniques for fuels and fire management have been strategically planned and implemented in WUI areas and have proven effective; however, it is important to note that all WUI mitigation focus areas will be different and should be planned for accordingly.

A CWPP offers the opportunity for collaboration of land managers to establish a definition and a boundary for the local WUI; to better understand the unique resources, fuels, topography, and climatic and structural characteristics of the area; and to prioritize and plan fuels treatments to mitigate for fire risks. At least 50% of all funds appropriated for projects under the HFRA must be used within the WUI area.

The Core Team has decided to delineate the WUI as an area 1 mile from the edge of an at-risk community. Because of the rural nature of the County, at-risk communities are in turn defined as all communities on the edge of urban areas. Much of this land encompasses agricultural lands with scattered homes in unincorporated areas. The WUI boundary has been therefore delineated as a 1-mile buffer extending from the edge of a structure or community. A 0.5-mile buffer is also delineated either side of all major roads. This would act as a fuel break from ignitions on the highways, as well as protection so that roads may serve as escape routes for the public in the event of a wildfire (Figure 3.1).

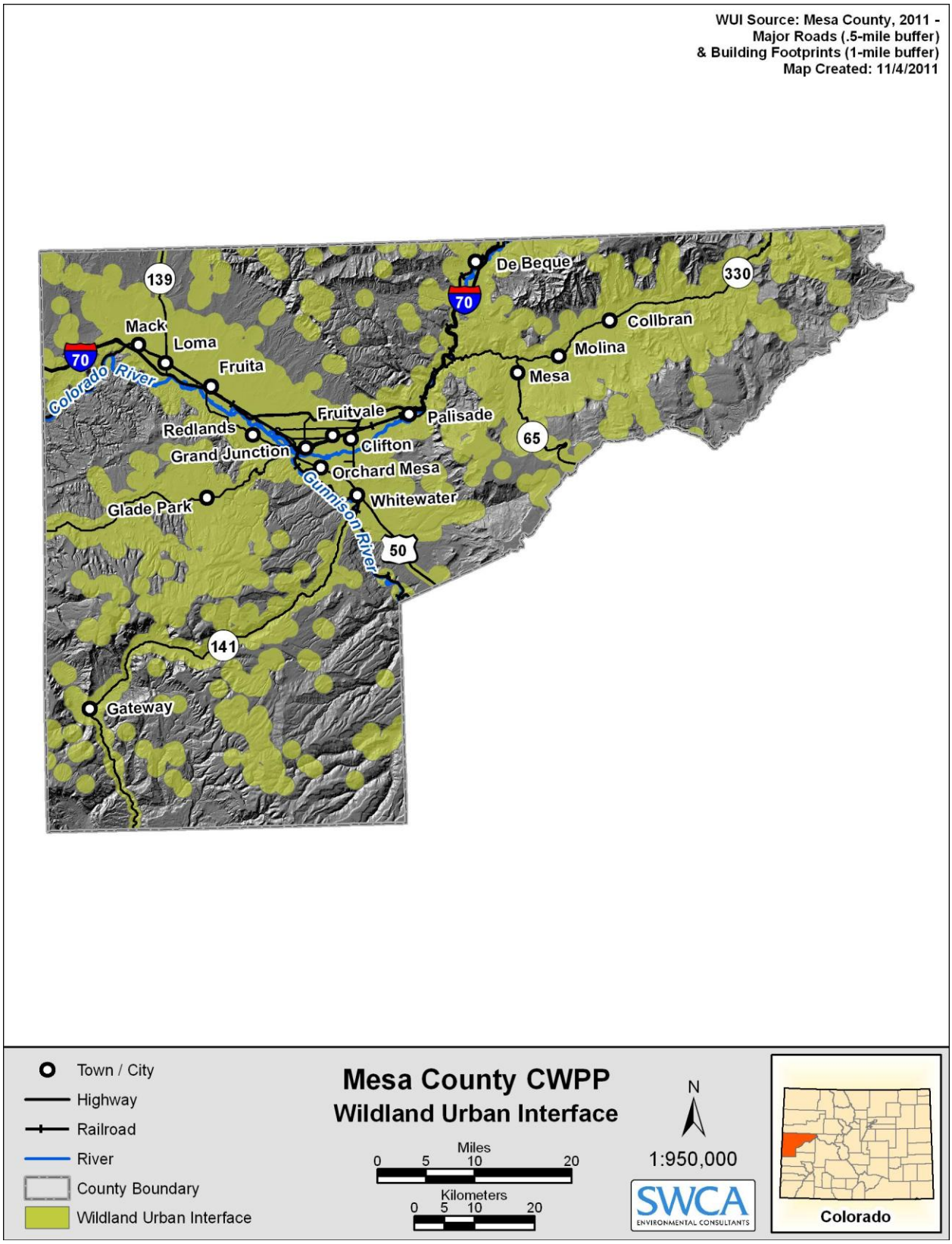


Figure 3.1. Mesa County WUI.

3.2 FIRE HISTORY

Most fire suppression experts believe that the threat of massive damage to human lives, private property, and natural resources is increasing throughout North America (National Fire Protection Association [NFPA] 1987; Arno et al. 2000). Wildland fires have become a major concern throughout Colorado in recent decades for a number of reasons: 1) human activity patterns have changed the landscapes over the past three decades, 2) natural resources are now highly valued and protected against widespread wildfire, 3) national wildland firefighting budgets are shrinking, 4) more people are escaping the cities into the wildlands, 5) many rural areas are dependent on VFDs that have insufficient funds and resources to fight large conflagrations, and 6) climatic conditions such as drought can be like a match to volatile fuels.

3.2.1 PAST FIRE MANAGEMENT POLICIES AND LAND MANAGEMENT ACTIONS

Prior to European settlement throughout the West in the 1800s, lightning- and human-ignited fires burned more frequently and less intensely. After that time, a dramatic increase in livestock grazing, fire suppression, and other human-related activities tended to alter the landscape and the associated fire regimes. Some species of non-native vegetation were also introduced during that time period and eventually invaded many native landscapes across the West, altering natural fire-disturbance processes.

Beginning in the early 1900s, the policy for handling wildland fire, initiated by the USFS, leaned heavily toward suppression. Over the years, other agencies, such as the BLM and the NPS, followed the lead of the USFS and adopted fire suppression as the accepted means for protecting the nation from wildfire. As a result, many areas now have excessive fuel buildups, dense and continuous vegetative cover, and tree and shrub encroachment upon open grasslands.

3.2.2 HISTORICAL FIRE REGIMES AND PRESENT CHANGES

Fire occurrence and behavior in the West have changed dramatically within the past several decades. Historically, frequent low-intensity surface fires burned throughout many areas within the County, creating a mosaic of different stages of vegetative structure across the landscape. For the most part, these fires helped to maintain an open vegetative community structure by consuming fuels on the ground surface, which maintained open grasslands, and by clearing them of encroaching vegetation.

Grasslands

Historic fire regimes in grasslands are not well understood, and obtaining historic fire samples within these habitat types is difficult. Many authors have suggested that the mean fire-return intervals (FRI) (the arithmetic average of all fire frequencies for a specific study site) for grasslands throughout the seventeenth to early nineteenth centuries are thought to have been every five to 10 years (Leopold 1924; Swetnam et al. 1992). Fire suppression policies may have contributed to declining fire frequency in this cover type, but other interacting factors also contribute. It is thought that about the time of the Civil War, intensive livestock grazing was responsible for a decline in grassland fires (West 1984). Heavy grazing reduced the fuel available to propagate fire spread and also reduced competition with herbaceous plants, tipping the balance in favor of the woody species. Woodland encroachment, increased tree density, and altered fire behavior characterize many former grasslands western US. Frequent fire plays a

significant role in grassland nutrient cycling and successional processes, and long-term exclusion may produce irreversible changes in ecosystem structure and function (McPherson 1995).

Shrublands

Pinyon-juniper woodlands are found throughout the planning area and are associated with deep soils. Juniper woodlands consist of widely scattered trees in a grass matrix (Dick-Peddie 1993). Similar to grasslands, the range of these woodland savannas has decreased as tree density has increased, but the mechanisms for the tree expansion are complex and the subject of current research. There is significant scientific debate currently over the natural FRI for savannas, but most experts agree that fire was more frequent in savannas than in modern times. Sagebrush is another dominant vegetation type in the County that has undergone significant change to its natural fire regime due in part to fire suppression and invasion by exotic annual grasses such as cheatgrass. Sagebrush currently occupies less area than it did historically and is becoming encroached upon by pinyon-juniper because of lack of frequent fire.

Riparian Areas

Although most of the County exhibits decreased occurrence of wildland fires compared to historical conditions, some areas within the County are actually experiencing an increase in fire occurrence and severity. Riparian ecosystems along river corridors were historically shaped by natural hydrologic regimes. Native riparian vegetation is not adapted to fire, and fires did not typically occur within this ecological zone. As a result, fire can actually influence the composition and structure of riparian ecosystems (Ellis 2001). The ecology of this habitat type has changed significantly over time, as fire-adapted invasive species such as saltcedar and Russian olive have invaded many areas. Once saltcedar has been established at a location, it increases the likelihood that the riparian area will burn and, as a result, alter the natural disturbance regime. Saltcedar and Russian olive both sprout readily after fire, and although cottonwood will also regenerate after fire, it typically has limited survival of resprouting individuals. Studies have found that the density of saltcedar foliage is higher at burned sites than unburned sites within riparian areas (Smith et al. 2006).

3.2.3 Recent Fire Occurrence in the Mesa CWPP Planning Area

Ignition Sources in Mesa County

According to available data, the number of human ignited wildfires is low compared to natural starts (Figure 3.2). Since approximately a third of all fires are of unknown cause, however, the numbers ignited by human activity may be higher than presented here. Human starts are often associated with roadside equipment or agricultural ditch or field burning. Lightning is common throughout the summer monsoon season, which typically takes place from July through August. Most of these fires are detected early and suppressed before they gain acreage; however, given the right conditions, these fires may grow large and become difficult to suppress. Human ignitions are starting to increase, particularly in the WUI, with the development and improvement of roads, railroads, residences, and recreational opportunities into wildland areas.

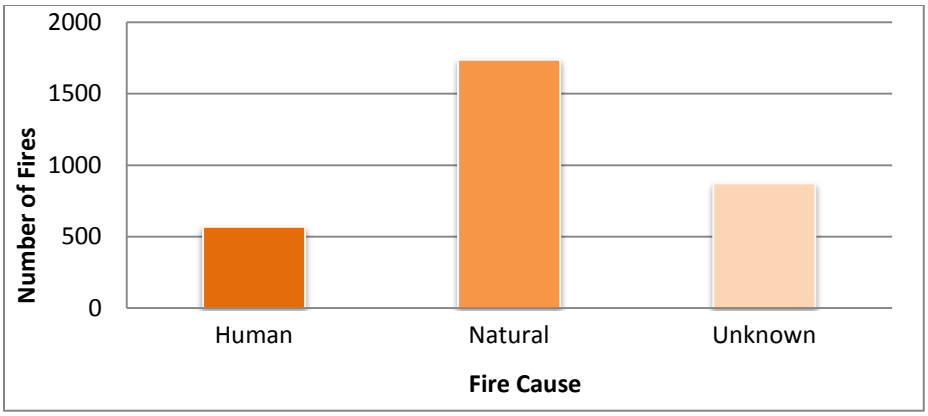


Figure 3.2. Ignition types for wildfire in Mesa County

Recent Fire History

Wildfires can occur throughout the year and are typically suppressed before they gain any acreage. County, state, and federal records document 3,181 wildfires in the County from 1980 to 2011 (Figure 3.3). Most of these fires are quickly contained and are less than 100 acres in size. Within that period however, 112 wildfires grew to greater than 100 acres in size.

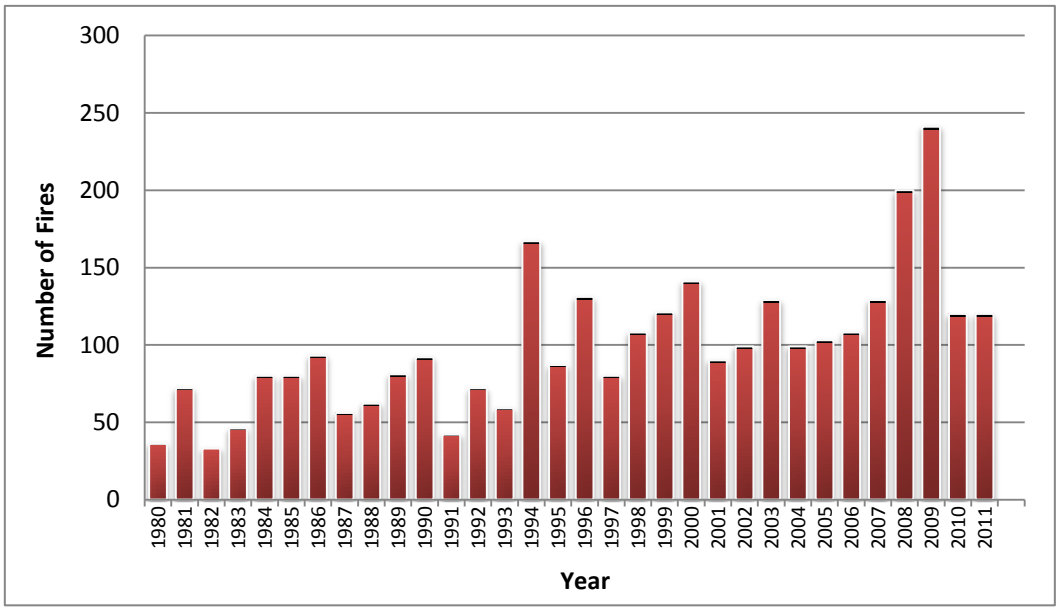


Figure 3.3. Number of Mesa County wildfires per year, 1980–2011.

From the documented period, 31 fires grew to over 1,000 acres and 10 grew to over 2,000 acres (Table 3.1). These were split between human and lightning caused.

Table 3.1. Large Fires (>1,000 acres) Reported within Mesa County from 1980–2011

Name	Date	Acreage	Jurisdiction	Cause
Hatchet	7/23/1996	5,580.00	BLM	Natural
Triangle	7/30/1995	5,343.00	BLM	Natural
Cone Mtn	7/3/2000	4,580.00	BLM	Natural
Two Road	7/12/1994	3,625.00	BLM	Natural
Dominguez	7/11/2009	2,599.00	USFS/BLM	Natural
Dierich Creek	6/9/2002	2,533.00	BLM	Human
Black Ridge Camp	7/2/1999	2,882.00	BLM	Natural
Cosgrove	8/16/2011	1,774.00	BLM	Natural
Rabbit Valley	7/2/1999	1,770	BLM	Natural
Coal Creek	7/8/2008	1,485	BLM	Natural

From Figure 3.3 it is clear that peak fire years occurred in 1994, 2000, 2008, and 2009. According to climate summaries (WRCC 2012), these years experienced lower than average precipitation and higher than average temperatures. Wildfires are now possible in any season; however, according to the data, the months of June, July, and August have the highest occurrence in the County.

3.3. CHALLENGES FOR FUTURE RESTORATION EFFORTS

In the past few years, fires have grown to record sizes and are burning earlier, longer, hotter, and more intensely than they have in the past (Westerling et al. 2006). According to the National Interagency Fire Center (NIFC), occurrence of catastrophic wildfires has greatly increased over the last 20 years. Westerling et al. (2006) claim that a study of large (>1,000 acres) wildfires throughout the western United States for the period 1970 to 2003 saw a pronounced increase in frequency of fire since the mid-1980s (1987–2003 fires were four times more frequent than the 1970–1986 average). The length of the fire season was also observed to increase by 78 days, comparing 1970–1986 to 1987–2003. Within just the last 10 years, a record number of acreages have burned and numbers are continually getting larger (NIFC 2010).

Changes in relative humidity are blamed for many of these conditions, as increased drying over much of the Southwest has led to an increase in days with high fire danger (Brown et al. 2004). Advanced computer models are now making national-scale simulations of ecosystems, providing predictions of how fire regimes will change in the twenty-first century (Neilson 2004). Western grasslands are predicted to undergo increased woody expansion of pinyon-juniper associated with increased precipitation during typical wet seasons. Summer months are predicted to be hotter and longer contributing to increased fire risk (Neilson 2004). Under greater climatic extremes widely predicted throughout the United States, fire behavior is expected to become more erratic, with larger flame lengths, increased torching and crowning, and more rapid runs and blowups associated with extremely dry conditions (Brown et al. 2004).

Although fire suppression is still aggressively practiced, fire management techniques are continually adapting and improving. Due to scattered human developments (homes, ranches, and farms) and values (residential and commercial structures, historic and natural values) throughout

the WUI, suppression will always have to be a priority. However, combining prescribed fire and managing wildland fire for resource benefit with effective fuels management and restoration techniques have been proven to help re-establish natural fire regimes and reduce the potential for catastrophic wildfires on public lands.

3.3 FIRE MANAGEMENT POLICY

The primary responsibility for WUI fire prevention and protection lies with property owners and state and local governments. Property owners must comply with existing state statutes and local regulations. These primary responsibilities should be carried out in partnership with the federal government and private sector areas. The current Federal Fire Policy states that protection priorities are 1) life, 2) property, and 3) natural resources. These priorities often limit flexibility in the decision-making process, especially when a wildland fire occurs within the WUI.

3.3.1 STATUTORY RESPONSIBILITY OF THE MESA COUNTY SHERIFF

According to Colorado Revised Statute (C.R.S.) 30-10-512, Sheriff to act as fire warden*:*

> *Subject to the provisions of the community wildfire protection plan prepared by the county in accordance with section 30-50-401.7 the sheriff of every county, in addition to other duties, shall act as fire warden of his or her respective county and is responsible for the coordination of fire suppression efforts in the case of prairie, forest or wildland fires or wildfire occurring in the unincorporated area of the county outside the boundaries of a fire protection district or that exceed the capabilities of the fire protection district to control or extinguish.*

3.3.2 FIRE MANAGEMENT PLANNING IN MESA COUNTY

There are a number of existing documents relating to fire management in the County that the reader is referred to, including the Mesa County Fire Plan (2004), the Mesa County Hazard Mitigation Plan (2010), and the Mesa County Annual Operating Plan (AOP) (2011). These documents provide more detailed information regarding operational procedures relating to wildfire. This CWPP is meant to supplement and not replace these existing plans.

Mesa County Fire Plan (2004)

The Mesa County Fire Plan (CSFS 2004) provides detailed analysis of the state statutes relating to wildfire, including C.R.S. 30-10-513, Sheriff in charge of forest or prairie fire-expenses, and C.R.S. 30-10-512, Sheriff to act as fire warden. The plan provides example fire scenarios, describing interagency agreements and the stages of response. In addition it provides details of Cooperative Resource Rate Forms, and the Emergency Fire Fund (EFF) and Wildfire Emergency Response Fund (WERF), relating to compensation for cooperators. The plan provides community members with details regarding wildfire mitigation and defensible space cost-share programs. Finally, the plan includes a WUI hazard assessment for the County. This assessment combines a fuel hazard layer (slope, fuels, aspect, and disturbance regime), a risk layer (lightning strikes, roads, and railroads), and a values layer (housing density) to form a combined hazard assessment. The overall hazard for the County was determined to be moderate to high, with the greatest hazards in areas of high housing density, heavier fuels, and steeper ground.

Mesa County Hazard Mitigation Plan (2010)

The Mesa County Hazard Mitigation Plan (Bullen and Martsolf 2010) addresses all hazards in the County, including avalanches, dam failure, drought, earthquakes, floods, etc. The plan provides hazard profiles and mitigation strategies for each hazard type, including wildfire. Examples of mitigation actions related to wildfire include identifying and prioritizing fuel reduction projects around critical infrastructure in wildfire hazard areas and carrying out community education regarding the risk of wildfires. These mitigation actions are addressed by this CWPP.

The plan provides detailed profiles on some of the larger communities in the County and a number of fire protection districts.

Mesa County Annual Operating Plan (2011)

There are many existing Joint Power Agreements (JPAs) and Memorandums of Understanding (MOUs) between the federal, state, and county agencies with jurisdictions within the County. More detailed information regarding standard operating procedures, agreed upon policies, and responsibilities to implement cooperative wildfire protection on all lands within the County can be found in the 2011 AOP (Mesa County 2011).

Jurisdictional responsibility is described in the AOP as:

> *Each jurisdictional agency has ultimate responsibility for wildfire protection on its own lands. The County Sheriff is responsible for fire protection on all non-federal lands in the county. Within Fire Protection Districts the Fire Chief is responsible for fire protection on non-federal lands, until this responsibility is transferred by mutual consent to the County Sheriff.* (Mesa County 2011:2)

Regarding mutual aid, the AOP states:

> *Mutual aid wildfire protection has been established county-wide between signatories to [the AOP]. It is agreed that there should be no delay in initial attack pending determination of the precise location of the fire, land ownership, or responsibility.* (Mesa County 2011:2)

The AOP lists all County mutual aid resources available from supporting agencies in an Attachment A to the main document, also found here in Appendix D. The AOP also describes the dispatch structure for the County and funding for operators.

In addition to these County-level plans, each agency has its own fire management policies and protocols. The reader should refer to the individual agency fire management plans or equivalent documents for specific details regarding agency fire management.

Community Wildfire Protection Plan for Redlands-Glade Park Wildland Urban Interface with Colorado National Monument (2008)

This plan was developed in 2008 to identify fire hazards along the boundary between the Colorado National Monument and private land. The purpose of the plan was to help the

communities immediately surrounding the Colorado National Monument to clarify and refine its priorities for the protection of life, property, and critical infrastructure in the WUI. The plan included a community risk assessment of the Redlands area of the City of Grand Junction and portions of unincorporated Mesa County. Individual homes were assessed as part of this process. An action plan was developed for mitigating identified hazards.

Community Wildfire Protection Plan for Ten Areas within the Plateau Valley Fire Protection District (2010)

This plan was developed in 2010 to provide a assessment of wildfire risk in the Plateau Valley Fire Protection District and establish priorities for hazard reduction activities, as well as develop a longer range fuels management and response plan for the district and adjacent agency lands. Furthermore the plan was developed to provide educational information and resources for the community. The plan assesses individual communities or subdivisions throughout the district and provides mitigation recommendations for reducing fire risk and hazard.

3.4 FIRE RESPONSE CAPABILITIES

When a fire is reported in Mesa County, a 911 call goes into the Grand Junction Regional Communications Center, which will dispatch the appropriate agency. The communications center determines whether the fire is on public or private land. Where there may be confusion regarding the jurisdictional boundary, the County Sheriff's Office Fire Team or fire districts respond to assist in initial attack. On confirmation of the jurisdictional boundary, the County will continue to support the fire or be called off depending on the situation. If the fire becomes too large for County resources to handle, a Type III incident team is called in. If complexity dictates, a Type II team may be needed; however, Type II incidents are rare in the County. The AOP lays out how air resources are ordered, who has suppression responsibility, and the Incident Command System. The CSFS is responsible for determining if the fire qualifies for EFF.

In case of a fire, the Grand Junction Regional Communications Center has an Emergency Preparedness Network that can telephone schools, businesses, and homes. This is a reverse 911 system that can call up to 2,000 calls a minute and will call back up to three times to make sure the message gets through.

The Upper Colorado River Interagency Fire Management Unit (UCR) is responsible for all wildfires on federal land in Mesa County. The UCR is an interagency organization composed of BLM, USFS, and NPS personnel. The UCR also has a dispatch center and air tanker base located at Grand Junction regional airport. The UCR supports wildfire response throughout the County as needed as part of the AOP. Federal firefighting resources will vary throughout the fire season depending on the severity code determined by the National Fire Danger Rating System (NFDRS), a complex index used to gage fire danger. In periods of severe wildfire potential, federal hotshot crews, smokejumpers, engines, and helicopters are brought in and placed on standby to increase suppression capabilities The UCR Grand Junction dispatch center sends out daily sheets about resources that are committed and where they are committed during fire season.

The County is unique in the collaboration that occurs between fire management agencies. The sheriff's office and fire warden have great relationships with all jurisdictions, especially the federal agencies.

3.4.1 Mesa County Fire Protection Districts

The County has 13 fire protection districts, with a mixture of full-time career firefighters and VFDs that provide initial attack response on lands within their districts (Figure 3.4 at the end of this section). As stated in Section 3.3.1, the County Sheriff is responsible for coordinating fire suppression efforts in unincorporated areas of the County, outside the boundaries of a fire protection district, or in situations that exceed the capabilities of the fire protection district to control or extinguish. The risk to community watersheds is one that most communities in the County share. Municipal and district watersheds either abut or share a fire shed with federal land. To ensure the safety of the watershed areas and to address perceived inequities in the current fire protection system, County fire protection districts should explore the opportunity for increased intergovernmental cooperation.

Members of the local fire protection districts are required to undergo rigorous training for wildfire response. For fires on private lands, qualifications for resources used on fires need to meet local agency standards. Personnel assigned to fires on federal lands must have completed National Wildfire Coordinating Group (NWCG) Wildland Fire Qualifications and be "red carded," meaning they have also completed a fitness test before being used on a fire. Many members of the local fire protection districts hold these NWCG qualifications and the BLM, the USFS, and the NPS provide on-the-job-training for local agency personnel seeking wildfire training.

The County Fire Warden emphasizes the importance of volunteers receiving the appropriate wildland fire training and makes a push to get many volunteers red carded and cross trained in S-130 Basic Wildland Firefighting and S-190 fire behavior training classes. Every year the County budgets $10,000 to send members to the Colorado Wildfire Academy. In cooperation with the CSFS, the County Fire Warden applies for Rural Fire Assistance (from the BLM and NPS) and Volunteer Fire Assistance (from the CSFS) cost-sharing assistance every year, and the fire departments rely heavily on that money for equipment.

The Glade Park VFD falls under the jurisdiction of the sheriff, because it is not a recognized local government. The County underwrites $4,000 per year for insurance for VFDs, because when a wildfire occurs they are working on behalf of the sheriff. There are great pressures on the local fire departments and VFDs. These departments have to be certified for the following: 1) state certification for different categories of Emergency Management Service, 2) hazardous material management certification, 3) structural firefighting NFPA qualifications, 4) and NWCG wildfire qualifications. Wildfire is a small percentage of what these departments do.

Details regarding fire protection resources are included in the AOP (Mesa County 2011), and sections of Attachment A-1 from that plan are included here as Appendix D showing resources for each fire protection district.

3.4.2 Mesa County Sheriff's Department

The County Sheriff serves in a coordinating role, assisting fire departments in getting the manpower, equipment, and funding for fires that exceed their capability. If a wildfire occurs outside a fire district, then the sheriff's office responds. In the County, a small portion of the population resides outside the fire protection districts. In order to coordinate this effort, the

County has a designated fire warden with a Mesa County Sheriff Department Fire Team to coordinate fire response on private lands. This team has two brush trucks and two support vehicles with more than 30 firefighters on call, made up of 25 Sheriff's Office staff and additional non-County employees. The team requires minimum training in wildland firefighting, including S-130/S-190. All team members are red-carded (meaning their qualifications are kept up to date annually and they have passed a physical fitness test). Each team member has all necessary personal protective equipment (PPE) and equipment for wildland fire suppression.

3.4.3 Office of Emergency Management

The main duties of the Office of Emergency Management are disaster planning. The Emergency Manager works closely with the Sheriff's Department and the Fire Warden, as well as the local fire protection districts. These individuals also play a key role in assessing wildfire risk and hazard and identifying communities and homeowners to target for assistance. The Office of Emergency Management also works with federal agencies to identify priority areas for joint public and private coordinated fuels treatments.

3.4.4 The Upper Colorado River Interagency Fire Management Unit

The BLM, USFS, and NPS partners in this CWPP are part of the UCR, which provides a full range of fire management services to participating federal, state, and local jurisdictions in west-central Colorado. The UCR is composed of the Colorado River Valley Field Office and Grand Junction Field Office of the BLM; the Grand Valley Ranger District of the Grand Mesa, Uncompahgre, and Gunnison National Forests; the White River National Forest; and the Colorado National Monument. The UCR cooperates with state agencies, local communities, and fire departments on a wide range of activities, including fuels treatments, fire prevention, and fire suppression.

The UCR has three engine crews, a seven-person Wildland Fire Module, and a fuels crew that are based in Grand Junction. These crews respond to wildfires on BLM, USFS, and Colorado National Monument land in the County. The UCR also trains other land managers from these agencies as red carded firefighters and can call on them as needed. The UCR hosts a number of wildfire courses that are open to any of the local fire department volunteers or employees. These include S-130, S-190, basic fire crew boss, engine boss, engine operator, intermediate fire behavior, and medical unit leader classes. The CSFS coordinates two statewide fire academies that attract and train hundreds of federal and private firefighters every year. The UCR works closely with the County Fire Warden and Office of Emergency Management to maintain communication.

3.4.5 Colorado State Forest Service

The CSFS does not have direct suppression responsibility for any lands. State statutes mandate that the CSFS will, upon request, assist county sheriffs with fire suppression efforts. This is accomplished through the following:

Emergency Fire Fund (EFF): In 2012, 43 counties in Colorado and the Denver Water Department paid into this insurance-type fund that can pay for catastrophic wildfires on state and private land that exceed a participating county's resources. EFF funding must be requested by the County Sheriff and can only be approved by the State Forester upon the recommendation of a

local CSFS representative. Federal agencies cannot obligate EFF funds. As identified in the county AOP, there is a minimum commitment of equipment for EFF consideration, which in Mesa County is two dozers, two water tenders, and five engines. The EFF is a necessary link to FEMA funding. Between the inception of the EFF in 1978 and the 2012 fire season, the County has experienced three fires declared eligible for EFF funding: the Clark Wash Fire (1989), Dierich Creek Fire (2002), and the Housetop Mountain Fire (2008).

Wildfire Emergency Response Fund (WERF): This fund, created in 2003 by state statute **(C.R.S. 23-30-310),** allows state funding for aerial fire suppression resources and hand crews. CSFS administers the WERF and notification must be made to the local CSFS district office when the WERF is requested. The WERF pays for the first load from a single- or multi-engine air tanker for a fire on private or state land requested by a sheriff or fire department. A helicopter may be requested instead of an air tanker, in which case the fund will pay for the first hour of rotor time. In addition, WERF will pay for use of a hand crew for up to two shifts on a fire. Preference is for the use of Colorado Department of Corrections crews.

CSFS Single Engine Air Tanker (SEAT) contract: For a number of years the CSFS has contracted with single-engine air tanker operators. The state tankers are pre-positioned throughout Colorado based on fire danger. A county sheriff may request a state tanker to be stationed locally, but must compete with other requests statewide dependent on fire danger.

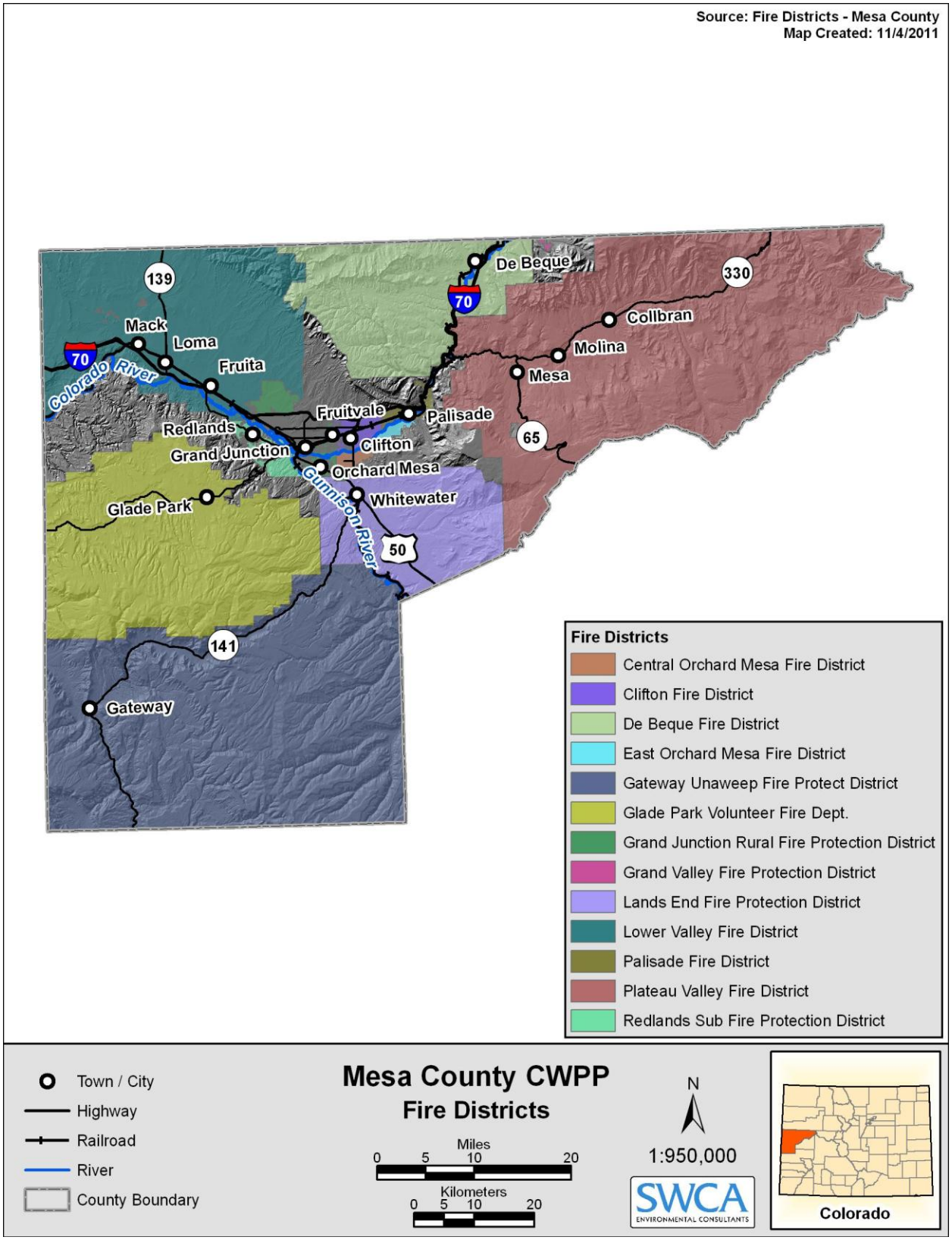


Figure 3.4. Mesa County fire districts.

4.0 RISK ASSESSMENT

4.1 PURPOSE

The purpose of developing the risk assessment model described here is to create a unique tool for evaluating the risk of wildland fires to communities within the WUI areas of the County. Although many definitions exist for hazard and risk, for the purpose of this document these definitions follow those used by the firefighting community. *Hazard* is a fuel complex defined by kind, arrangement, volume, condition, and location that forms a special threat of ignition and resistance to control. *Risk* is defined as the chance of a fire starting as determined by the presence and activity of causative agents (NWCG 1998). The risk assessment is twofold and combines a GIS model of hazard based on fire behavior and fuels modeling technology (Composite Risk/Hazard Assessment) and a field assessment of community hazards and values at risk (Community Risk/Hazard Assessment).

From these assessments, land use managers, fire officials, planners, and others can begin to prepare strategies and methods for reducing the threat of wildfire, as well as work with community members to educate them about methods for reducing the damaging consequences of fire. The fuels reduction treatments can be implemented on both private and public land, so community members have the opportunity to actively apply the treatments on their properties, as well as recommend treatments on public land that they use or care about.

4.2 FIRE BEHAVIOR MODEL

4.2.1 OVERVIEW

The wildland fire environment consists of three factors that influence the spread of wildfire: fuels, topography, and weather. Understanding how these factors interact to produce a range of fire behavior is fundamental to determining treatment strategies and priorities in the WUI. In the wildland environment, vegetation is synonymous with fuels. When sufficient fuels for continued combustion are present, the level of risk for those residing in the WUI is heightened. Fire spreads in three ways: 1) surface fire spread—the flaming front remains on the ground surface (in grasses, shrubs, small trees, etc.) and resistance to control is comparatively low; 2) crown fire—the surface fire "ladders" up into the upper levels of the forest canopy and spreads through the tops (or crowns) independent of or along with the surface fire, and when sustained is often beyond the capabilities of suppression resources; and 3) spotting—embers are lifted and carried with the wind ahead of the main fire and ignite in receptive fuels; if embers are plentiful and/or long range (>0.5 mile), resistance to control can be very high. Spotting is often the greatest concern to communities in the path of a wildland fire. In areas where homes are situated close to riparian fuels and/or denser shrubs and trees, potential spotting from woody fuels to adjacent fuels should be acknowledged.

Treating fuels in the WUI can lessen the risk of intense or extreme fire behavior. Studies and observations of fires burning in areas where fuel treatments have occurred have shown that the fire either remains on or drops to the surface, thus avoiding destructive crown fire. Also, treating fuels decreases spotting potential and increases the ability to detect and suppress any spot fires

that do occur. Fuels mitigation efforts therefore should be focused specifically where these critical conditions could develop in or near communities at risk.

4.2.2 Fire Behavior Model Components

For this plan, an assessment of fire behavior has been carried out using well-established fire behavior models: FARSITE, FlamMap, BehavePlus, and FireFamily Plus, as well as ArcGIS Desktop Spatial Analyst tools. Data used in the Composite Risk/Hazard Assessment is largely obtained from LANDFIRE.

LANDFIRE

LANDFIRE is a national remote sensing project that provides land managers a data source for all inputs needed for FARSITE, FlamMap, and other fire behavior models. The database is managed by the USFS and the USDI and is widely used throughout the United States for land management planning. More information can be obtained from http://www.landfire.gov.

FARSITE

FARSITE is a computer model based on Rothermel's spread equations (Rothermel 1983); the model also incorporates crown fire models. FARSITE uses spatial data on fuels, canopy cover, crown bulk density, canopy base height, canopy height, aspect, slope, elevation, wind, and weather to model fire behavior across a landscape. In essence, FARSITE is a spatial and temporal fire behavior model. FARSITE is used to generate fuel moisture and landscape files as inputs for FlamMap. Information on fire behavior models can be obtained from http://www.fire.org.

FlamMap

Like FARSITE, FlamMap uses a spatial component for its inputs but only provides fire behavior predictions for a single set of weather inputs. In essence, FlamMap gives fire behavior predictions across a landscape for a snapshot of time; however, FlamMap does not predict fire spread across the landscape. FlamMap has been used for the MCCWPP to predict fire behavior across the landscape under extreme (worst case) weather scenarios.

BehavePlus

Also using Rothermel's (1983) equations, BehavePlus is a multifaceted fire behavior model and has been used to determine fuel moisture in this process.

4.2.3 Fire Behavior Model Inputs

Fuels

The fuels in the planning area are classified using Scott and Burgan's (2005) Standard Fire Behavior Fuel Model classification system. This classification system is based on the Rothermel surface fire spread equations, and each vegetation and litter type is broken down into 40 fuel models. This classification has been selected because of the amount of herbaceous fuel in the planning area. These herbaceous fuels have a dynamic fuel moisture component that affects the intensity at which they would burn based on the degree of seasonal curing. The Scott and Burgan (2005) system acknowledges this feature of herbaceous fuels and classifies them accordingly.

The general classification of fuels is by fire-carrying fuel type (Scott and Burgan 2005):

(NB) Nonburnable
(GR) Grass
(GS) Grass-Shrub
(SH) Shrub
(TU) Timber-Understory
(TL) Timber Litter
(SB) Slash-Blowdown

Table 4.1 provides a description of each fuel type.

Table 4.1. Fuel Model Classification for MCCWPP Planning Area

1.	**Nearly pure grass and/or forb type (Grass)**
i.	**GR1:** Grass is short, patchy, and possibly heavily grazed. Spread rate is moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load 0.40 (ton/acre).
ii.	**GR2:** Moderately coarse continuous grass, average depth about 1 foot. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load 1.10 (tons/acre).
2.	**Mixture of grass and shrub, up to about 50% shrub cover (Grass-Shrub)**
i.	**GS1:** Shrubs are about 1 foot high, low grass load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load 1.35 (tons/acre).
ii.	**GS2:** Shrubs are 1–3 feet high, moderate grass load. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load 2.1 (tons/acre).
3.	**Shrubs cover at least 50% of the site; grass sparse to nonexistent (Shrub)**
i.	**SH1:** Low shrub fuel load, fuelbed depth about 1 foot; some grass may be present. Spread rate very low (0–2 chains/hour); flame length very low (0–1 foot); fine fuel load 1.7 (tons/acre).
ii.	**SH2:** Moderate fuel load (higher than SH1), depth about 1 foot, no grass fuels present. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load 5.2 (tons/acre).
iii.	**SH5:** Heavy shrub load, depth 4–6 feet. Spread rate very high (50–150 chains/hour); flame length very high (12–25 feet); fine fuel load 6.5 (tons/acre).
iv.	**SH7:** Very heavy shrub load, depth 4–6 feet. Spread rate lower than SH5, but flame length similar. Spread rate high (20–50 chains/hour); flame length very high (12–25 feet); fine fuel load 6.9 (tons/acre).
4.	**Grass or shrubs mixed with litter from forest canopy (Timber-Understory)**
i.	**TU1:** Fuelbed is low load of grass and/or shrub with litter. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load 1.3 (tons/acre).
ii.	**TU2:** Fuel bed is moderate litter load with shrub component. Spread rate moderate (5-20 chains/hour), flame length is low (1-4 feet).
iii.	**TU5:** Fuelbed is high load conifer litter with shrub understory. Spread rate moderate (5–20 chains/hour); flame length moderate (4–8 feet).
5.	**Dead and downed woody fuel (litter) beneath a forest canopy (Limber Litter)**
i.	**TL1:** Light to moderate load, fuels 1–2 inches deep. Spread rate very low (0–2 chains/hour); flame length very low (0–1 feet).
ii.	**TL2:** Low load, compact. Spread rate very low ((0-2 chains/hour); flame length very low (0-1 feet).
iii.	**TL3:** Moderate load. Spread rate very slow (0–2 chains/hour); flame length low (1–4 foot); fine fuel load 0.5 (ton/acre).
iv.	**TL5:** High load conifer litter; light slash or mortality fuel. Spread rate is low (2-5 chains/hour); flame length low (1-4 feet).
v.	**TL6:** Moderate load, less compact. Spread rate moderate (5-20 chains/hour); flame length low (1-4 feet).
vi.	**TL8:** Moderate load and compactness may include small amounts of herbaceous load. Spread rate moderate (5-20chains/hour); flame length low (1–4 feet).
6.	**Insufficient wildland fuel to carry wildland fire under any condition (Nonburnable)**
i.	**NB1:** Urban or suburban development; insufficient wildland fuel to carry wildland fire.
ii.	**NB3:** Agricultural field, maintained in nonburnable condition.
iii.	**NB8:** Open water.
iv.	**NB9:** Bare ground.

Notes: Based on Scott and Burgan's (2005) 40 Fuel Model System.
Climate is arid to semiarid for all fuel types.
Only categories present on the MCCWPP fuel maps are presented above. For more information refer to Scott and Burgan (2005).

Map 1 in Appendix A illustrates the fuels classification throughout the planning area. Fuels are highly variable across the planning area. The classification is described by fire district below.

Lower Valley Fire District Fuels

The fuels in this district are primarily grass (GR1 and GR2) and grass-shrub (GS1 and GS2) fuels. The grassland fuels are most common around the agricultural region of the district and close to municipalities where the vegetation consists of grassland steppe with interspersed scrub and shrub. GR1 is a sparse grass fuel, short either naturally or as a result of grazing; spread rates are moderate (5–20 chains per hour [ch/h]) and flame lengths are low (1–4 feet). GR2 is a moderately coarse continuous grass fuel with a depth of approximately 1 foot. Spread rate in these fuels is high (20–50 ch/h) and flame lengths are low to moderate (2–8 feet). The grass-shrub fuels are most common in the more rural remote areas of the district to the north and south. GS1 fuels are dry climate grass-shrub fuels with shrub heights about 1 foot, with a moderate spread rate (5–20 ch/h) and low flame lengths (1–4 feet). GS2 fuels are made up of shrubs that are 1 to 3 feet high with a moderate grass understory. Spread rates and flame length are higher than the GS1 fuels.

Plateau Valley Fire Protection District Fuels

The fuels in this district are the most varied of all the districts ranging from grassland (GR1) in the lower elevations and agricultural areas to timber (TL8) at the highest elevation. The dominant fuels in the south (and north-central) portion of the district are timber with understory components (TU1 and TU5). TU1 fuels are characterized by aspen with understory shrub and load grasses. Spread rate in these fuels is low (0–5 ch/h), as is flame length (1–4 feet). The TU5 fuels are higher elevation mixed conifer where the primary carrier of fire is heavy forest litter with a shrub or small tree understory. Spread rates and flame lengths are moderate (5–20 ch/h and 4–8 feet, respectively) in this fuel type. The northern half of the district is characterized by more shrub and grass-shrub fuels (GS1 and SH7). GS1 fuels are dry climate grass-shrub fuels with shrub heights about 1 foot, with a moderate spread rate (5–20 ch/h) and low flame lengths (1–4 feet). SH7 fuels are very high load, dry climate shrub fuels with depths of 4 to 6 feet, typical of pinyon-juniper and scrub habitats. Spread rates are high (20–50 ch/h) and flame lengths are very high (12–25 feet) in this fuel type.

Glade Park Volunteer Fire Department

The fuels in this district are a mixture of grass-shrub (GS1 and GS2), timber understory (TU1), and timber litter (TL3 and TL8) fuels. The community of Glade Park is made up primarily of grass-shrub fuels with pinyon-juniper interspersed. GS1 fuels are dry climate grass-shrub fuels with shrub heights about 1 foot, with a moderate spread rate (5–20 ch/h) and low flame lengths (1–4 feet). GS2 fuels are made up of shrubs that are 1 to 3 feet high with a moderate grass understory. Spread rates and flame length are higher than the GS1 fuels. TU1 fuels are characterized by aspen with understory shrub and load grasses. Spread rate in these fuels is low (0–5 chains/hour), as is flame length (1–4 feet). TL3 fuels are moderate load conifer litter fuels with very low spread rates (0–2 ch/h) and low flame lengths (1–4 feet). TL8 fuels have moderate rates of spread (5–20 ch/h) and low flame lengths (1–4 feet), with the primary fire carrier being long needle pine litter.

De Beque Fire District

The De Beque district is dominated by GS1 and GS2 fuels. GS1 fuels are dry climate grass-shrub fuels with shrub heights about 1 foot, with a moderate spread rate (5–20 ch/h) and low flame lengths (1–4 feet). GS2 fuels are made up of shrubs that are 1 to 3 feet high with a moderate grass understory. Spread rates and flame length are higher than the GS1 fuels.

East Orchard Mesa Fire District

The fuels in this district are represented as non-burnable 3 (NB3) mixed with grassland shrub fuels (GS1) and shrub fuels (SH1). NB3 is deceiving, as it is the classification given to agricultural fuels including irrigated annual crops, mowed or tilled orchards, etc. This vegetation type can be flammable at certain times of the year and so should not be considered non-burnable year-round when assessing risk at the community level. GS1 fuels are dry climate grass-shrub fuels with shrub heights about 1 foot, with a moderate spread rate (5–20 ch/h) and low flame lengths (1–4 feet).

Central Orchard Mesa Fire District

The fuels in this district are represented as non-burnable 3 (NB3) mixed with grassland shrub fuels (GS1) and shrub fuels (SH1). NB3 is deceiving as it is the classification given to agricultural fuels including irrigated annual crops, mowed or tilled orchards, etc. This vegetation type can be flammable at certain times of the year and so should not be considered non-burnable year-round when assessing risk at the community level. GS1 fuels are dry climate grass-shrub fuels with shrub heights about 1 foot, with a moderate spread rate (5–20 ch/h) and low flame lengths (1–4 feet).

Clifton Fire District

The Clifton district is made up of a mixture of fuel types, mostly non-burnable urban developed land (NB1) with patches of timber fuels (TL2) that represent the wash areas and residential landscaping. TL2 fuels are characterized by broadleaf deciduous litter that has a very slow spread rate (0–2 ch/hr) and very low flame length (0–1 foot).

Gateway Unaweep Fire Protection District

The fuels in this district are extremely diverse, ranging from grassland (GR1) fuels in the valley and transitioning to grass and shrub fuels and timber fuels (TU1, TL3, TL8) at the highest elevations. GR1 is a sparse grass fuel, short either naturally or as a result of grazing; spread rates are moderate (5–20 chains/hour) and flame lengths are low (1–4 feet). GS1 fuels are dry climate grass-shrub fuels with shrub heights about 1 foot, with a moderate spread rate (5–20 ch/h) and low flame lengths (1–4 feet). GS2 fuels are made up of shrubs that are 1 to 3 feet high with a moderate grass understory. Spread rates and flame length are higher than the GS1 fuels. TU1 fuels are characterized by aspen with understory shrub and load grasses. Spread rate in these fuels is low (0–5 ch/h), as is flame length (1–4 feet). TL3 fuels are moderate load conifer litter fuels with very low spread rates (0–2 ch/h) and low flame lengths (1–4 feet). TL8 fuels have moderate rates of spread (5–20 ch/h) and low flame lengths (1–4 feet), with the primary fire carrier being long needle pine litter.

Grand Junction Fire Department, Rural Fire Protection District, and Redlands Substation

This area that incorporates the city of Grand Junction and the Redlands area has a mixture of urban and wildland fuels. The majority of Grand Junction is made up of non-burnable urban developed land (NB1); however, there are patches of timber fuels (TL2) that represent the wash areas and residential landscaping and are characterized by broadleaf deciduous litter that has a very slow spread rate (0–2 ch/hr) and very low flame length (0–1 foot). Also present are non-burnable agricultural (NB3) fuels, which is deceiving as it is the classification given to agricultural fuels including irrigated annual crops, mowed or tilled orchards, etc. This vegetation type can be flammable at certain times of the year and so should not be considered non-burnable year-round when assessing risk at the community level.

Palisade Fire District

The fuels in this district are represented as non-burnable 3 (NB3) mixed with grassland shrub fuels (GS1) and shrub fuels (SH1). NB3 is deceiving as it is the classification given to agricultural fuels including irrigated annual crops, mowed or tilled orchards, etc. This vegetation type can be flammable at certain times of the year and so should not be considered non-burnable year-round when assessing risk at the community level. GS1 fuels are dry climate grass-shrub fuels with shrub heights about 1 foot, with a moderate spread rate (5–20 ch/h) and low flame lengths (1–4 feet).

Lands End Fire Protection District

The fuels in this district are extremely diverse ranging from grassland (GR1) fuels in the valley transitioning to grass and shrub fuels and timber fuels (TU1, TL3, TL8) at the highest elevations. GR1 is a sparse grass fuel, short either naturally or as a result of grazing; spread rates are moderate (5–20 ch/h) and flame lengths are low (1–4 feet). GS1 fuels are dry climate grass-shrub fuels with shrub heights about 1 foot, with a moderate spread rate (5–20 ch/h) and low flame lengths (1–4 feet). GS2 fuels are made up of shrubs that are 1 to 3 feet high with a moderate grass understory. Spread rates and flame length are higher than the GS1 fuels. TU1 fuels are characterized by aspen with understory shrub and load grasses. Spread rate in these fuels is low (0–5 ch/h), as is flame length (1–4 feet). TL3 fuels are moderate load conifer litter fuels with very low spread rates (0–2 ch/h) and low flame lengths (1–4 feet). TL8 fuels have moderate rates of spread (5–20 ch/h) and low flame lengths (1–4 feet), with the primary fire carrier being long needle pine litter.

Topography

Topography is important in determining fire behavior. Steepness of slope, aspect (direction the slope faces), elevation, and landscape features can all affect fuels, local weather (by channeling winds and affecting local temperatures), and rate of spread of wildfire. The topography in the planning area is extremely diverse, from the relatively flat, gently sloping Grand Valley to the steep mesas of the Grand Mesa and the Colorado National Monument. Aspect and slope can assert significant influence on fire behavior, so where topography does fluctuate, flame lengths and rate of spread could vary considerably. Other topographic features that could be significant are river corridors and tributaries that may funnel fire and intensify fire behavior.

Weather

Of the three fire behavior components, weather is the most likely to fluctuate. Accurately predicting fire weather remains a challenge for forecasters, particularly during drought conditions. As spring and summer winds and rising temperatures dry fuels, particularly on south-facing slopes, conditions can deteriorate rapidly, creating an environment that is susceptible to wildland fire. Fine fuels (grass and leaf litter) can cure rapidly, making them highly flammable in as little as one hour following light precipitation. Low live fuel moistures (typical in drought conditions throughout Colorado) of shrubs and trees can significantly contribute to fire behavior in the form of crowning and torching. With a high wind, grass fires can spread rapidly, engulfing communities, often with limited warning for evacuation. The creation of defensible space is of vital importance in protecting communities from this type of fire. For instance, a carefully constructed fuel break placed in an appropriate location could protect homes or possibly an entire community from fire. This type of defensible space can also provide safer conditions for firefighters, improving their ability to suppress fire and protect life and property.

One of the critical inputs for FlamMap is fuel moisture files. For this purpose weather data have been obtained from FAMWEB (NWCG 2012), a fire weather database maintained by the NWCG. A remote automated weather (RAW) station was selected (at Pine Ridge, Mesa County) and data were downloaded from the website.

Using an additional fire program (FireFamily Plus) with the RAW station data, weather files that included prevailing wind direction and 20-foot wind speed were created. Fuel moisture files were then developed for downed (1-hour, 10-hour, and-100 hour) and live herbaceous and live woody fuels. These files represent weather inputs in FlamMap; 95 to 100 percentile weather is used to predict the most extreme scenarios for fire behavior.

4.2.4 Fire Behavior Model Outputs

The following is a discussion of the fire behavior outputs from FlamMap.

Flame Length

Map 2 in Appendix A illustrates the flame length classifications for the County. Flame lengths are determined by fuels, weather, and topography. Flame length is a particularly important component of the risk assessment because it relates to potential crown fire (particularly important in timber and riparian areas) and suppression tactics. Direct attack by hand lines is usually limited to flame lengths less than 4 feet. In excess of 4 feet, indirect suppression is the dominant tactic. Suppression using engines and heavy equipment will move from direct to indirect with flame lengths in excess of 8 feet.

Flame lengths across the County are split primarily between the two extremes: low (0–4 feet) and extreme (>11 feet). The greatest flame lengths tend to be concentrated away from most larger communities but are spread throughout the Glade Park area and along the Colorado State Highway 141 and 330 corridors where homes are interspersed with wildland fuels.

Fireline Intensity

Map 3 in Appendix A illustrates the predicted fireline intensity throughout the planning area. Fireline intensity describes the rate of energy released by the flaming front and is measured in

British Thermal Units per foot, per second (BTU/ft/sec). This is a good measure of intensity, and suppression activities are planned according to it. The expected fireline intensity throughout the County is similar in pattern to predicted flame length, as fireline intensity is a function of flame length. The pattern for fireline intensity is similar to flame length in that intensities are primarily low or extreme and the extreme areas tend to be located further form larger communities but throughout areas such as Glade Park and the Colorado State Highway 141 and 330 corridors. High fireline intensity is predicted to occur in the shrubland communities and would be lower in the grass-dominated fuels.

Rate of Spread

Map 4 in Appendix A illustrates the rate of spread classifications for the planning area. The rates of spread are a little more diverse than flame length and fireline intensity with rates in the low, moderate, high, and extreme categories. Low to moderate rates of spread are found in the lower valleys and Grand Junction portions of the County, but with some small patches of high and extreme that are still a concern around communities and along the river corridor. The highest rates of spread are associated with the grass and shrub fuels in the unincorporated parts of the County around Glade Park, Gateway, east and west of De Beque, and along the Colorado State Highway 330 corridor. Extreme rates of spread are found around many communities and the Core Team acknowledge that rate of spread of wildfire is the greatest concern in terms of fire behavior and risk. Agricultural and urban areas are clearly delineated in this model by their low rate of spread; however, these fuel types can also pose a severe hazard during certain times of the year and are often areas of ignition through human activity in urban areas or agricultural burning of crops and land.

Crown Fire Potential

Map 5 in Appendix A illustrates the predicted crown fire potential throughout the planning area. Crown fire activity in the County is confined to shrub and timber fuels; surface fire activity occurs in the grassland fuels.

Fire Occurrence/Density of Starts

Map 6 in Appendix A illustrates the fire occurrence density for the planning area. Fire occurrence density has been determined by performing a density analysis on fire start locations with ArcGIS Desktop Spatial Analyst. These locations have been provided by the County, the CSFS, and the BLM as GIS points, and when combined the points show the location of fire starts within the project area over the last 22 years (1980–2012). The density analysis has been performed over a 5-mile search radius. The density of previous fire starts is used to determine the risk of ignition of a fire. Map 6 in Appendix A reveals a definite pattern of fires close to populated areas and along all highways. High fire density is observed throughout the central core of the County, with the greatest density (>1 fire per square mile) occurring around Grand Junction and the Redlands and between Palisade and De Beque on BLM lands.

The fire occurrence maps are used to provide information on areas where human- and lightning-ignited fires are prevalent and hence could be more prone to fire in the future.

4.2.5 GIS OVERLAY PROCESS

All data used in the risk assessment have been processed using ESRI ArcGIS Desktop and the ESRI Spatial Analyst Extension. Information on these programs can be found at http://www.esri.com. Data have been gathered from all relevant agencies, and the most current data have been used.

All fire parameter datasets have been converted to a raster format (a common GIS data format comprising a grid of cells or pixels, with each pixel containing a single value). The cell size for the data is 30 × 30 meters (98 × 98 feet). Each of the original cell values have been reclassified with a new value between 1 and 4, based on the significance of the data (1 = lowest, 4 = highest). Prior to running the models on the reclassified datasets, each of the input parameters have been weighted; that is, they are assigned a percentage value reflecting that parameter's importance in the model. The parameters are then placed into a Weighted Overlay Model, which "stacks" each geographically aligned dataset and evaluates an output value derived from each cell value of the overlaid dataset in combination with the weighted assessment. The resulting dataset contains only values 1 through 4 (1 = low, 2 = medium, 3 = high, 4 = extreme) to denote fire risk. This ranking shows the relative fire risk of each cell based on the input parameters. Figure 4.1 illustrates the individual datasets and the relative weights assigned within the modeling framework.

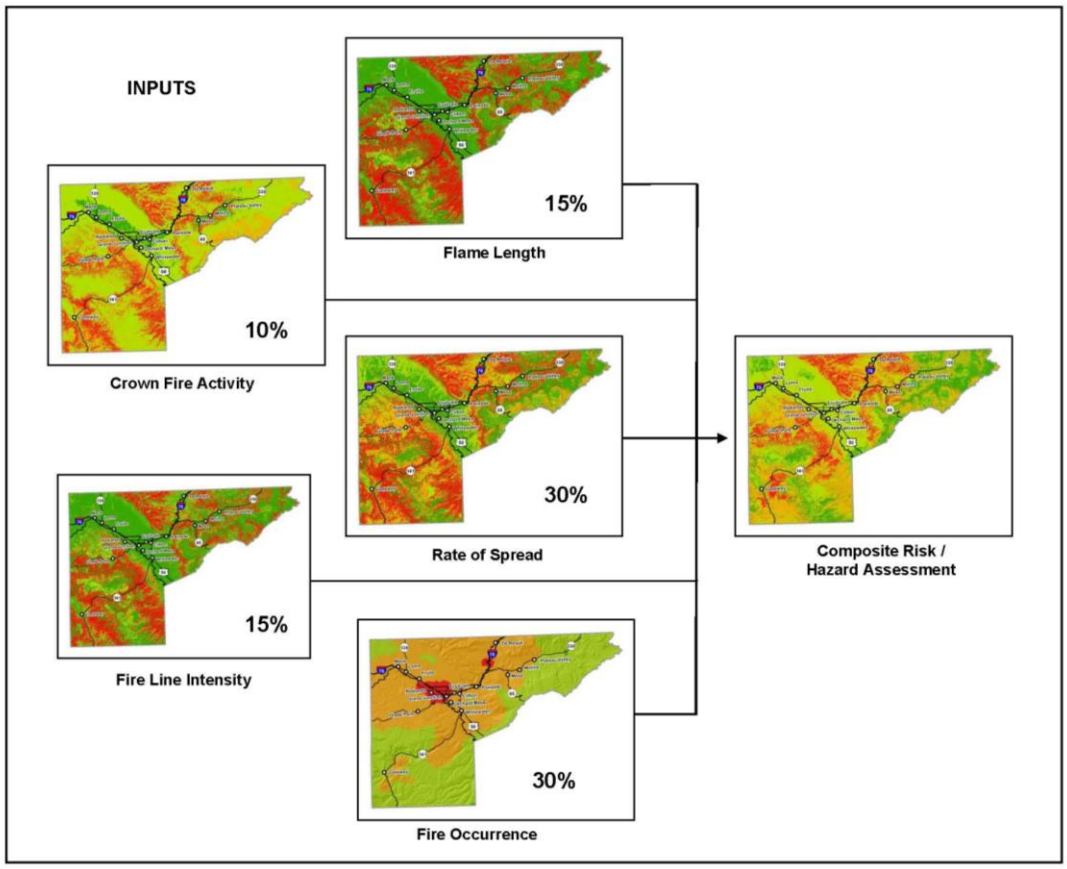


Figure 4.1. Composite Risk/Hazard Assessment overlay

4.3 COMPOSITE RISK/HAZARD ASSESSMENT

Figure 4.2 is the risk assessment for the planning area; it combines all the fire behavior parameters described above. The risk assessment classifies the planning area into low, moderate, high, and extreme risk categories.

The risk assessment depicts risk in the County as extremely diverse. The most extreme risk (shown in red) is associated with the shrubland fuels around Glade Park, along the Colorado State Highway 141 corridor and Unaweep Canyon, along the Colorado State Highway 330 corridor through Plateau Valley, and along the I-70 corridor from Palisade to De Beque. A more detailed discussion of the GIS Risk/Hazard Assessment map is provided below by fire district.

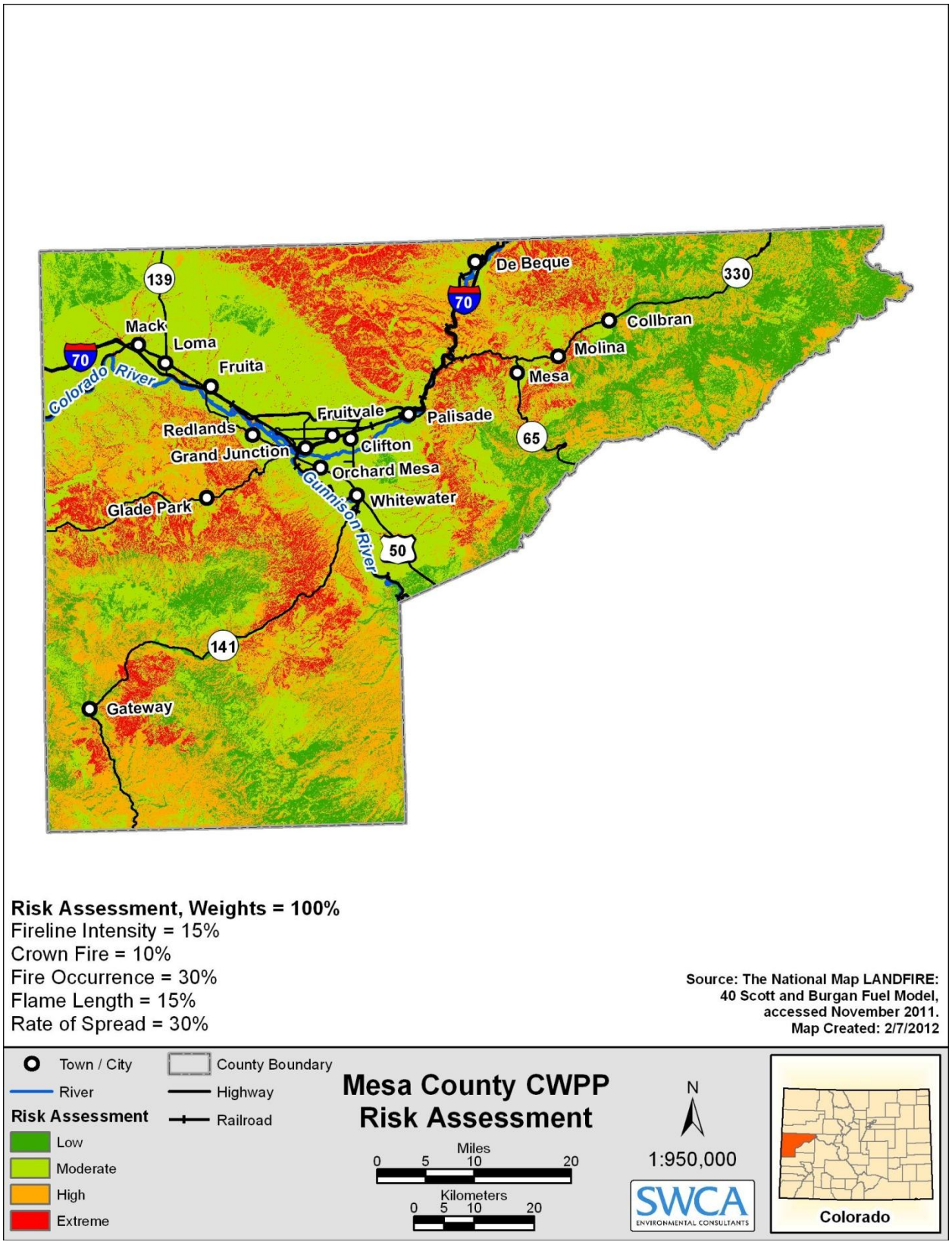


Figure 4.2. Composite Risk/Hazard Assessment map.

4.4 COMMUNITY RISK/HAZARD ASSESSMENTS

As part of the planning process, the Core Team compiled a list of communities within the planning area that fall within the WUI for the County. In order to properly assess the hazards in and around these communities, a series of field days were implemented to carry out community assessments.

The assessments were conducted in December 2011 and January 2012 with assistance from each fire district. The community assessment was carried out using the NFPA Wildland Fire Risk and Hazard Severity Form 1144 (Appendix E). This form is based on the NFPA Standard for Reducing Structure Ignition Hazards from Wildland Fire 2008 Edition, which was in turn developed by the Technical Committee on Forest and Rural Fire Protection and issued by the Standards Council on June 4, 2007. The NFPA standard focuses on individual structure hazards and requires a spatial approach to assessing and mitigating wildfire hazards around existing structures. It also includes ignition-resistant requirements for new construction and is used by planners and developers in areas that are threatened by wildfire and is commonly applied in the development of Firewise Communities (for more information, see www.firewise.org).

Each community was rated based on conditions within the community and immediately surrounding structures, including access, adjacent vegetation (fuels), defensible space, adjacent topography, roof and building characteristics, available fire protection, and placement of utilities. Where a range of conditions was less easily parsed out, a range of values was assigned on a single assessment form. Each score was given a corresponding adjective rating of low, moderate, high, or extreme. An example of the assessment form used in this plan can be found in Appendix E. The purpose of the community WUI assessment and subsequent hazard ratings is to identify fire hazard and risks and prioritize areas requiring mitigation and more detailed planning. These assessments should not be seen as tactical pre-suppression or triage plans. The community assessment helps to drive the recommendations for mitigation of structural ignitability, community preparedness, and public education. The assessment also helps to prioritize areas for fuels treatment based on the hazard rating.

The hazard ratings from the community assessment and the GIS hazard/risk assessment are provided in Table 4.2. This table also includes a summary of the positive and negative attributes of a community as they relate to wildfire risk. Some communities had been part of the community-level CWPPs for the Redlands-Glade Park Wildland Urban Interface with Colorado National Monument (2008) and the Plateau Valley Fire Protection District (2010); for these communities a summary of the findings from those plans are included. For more detailed results of the community-level CWPPs please refer to the individual plans.

Table 4.2. Community Risk Assessment Summary

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Grand Junction Rural Fire Protection District, Grand Junction Fire Department, Redlands Sub Fire Protection District						
River Corridor	Grand Junction	107 (High)	High and extreme	Reliable water supply, close to fire departments, good accessibility.	High fire frequency, some thick riparian fuels, little defensible space.	No community-level plan.
Redlands	Grand Junction	105 (High)	Moderate–extreme	Good accessibility, close to fire department.	Lack of defensible space, combustible construction, WUI community, limited water supply, combustible roofing.	Replace hazardous roofing materials, implement defensible space, improve driveway access, create fuel break along jurisdictional boundaries
Orchard Mesa	Grand Junction	77 (High)	Moderate–extreme	Good accessibility, water from hydrants, less than 5 miles from station.	Poor defensible space, some thick riparian fuels.	No community-level plan.
Preserve	Grand Junction	75 (High)	Moderate–extreme	System of hydrants and close to fire department, newer construction homes	Poor accessibility to driveways, thick continuous fuels, history of fire occurrence.	No community-level plan.
Ridges/Redl and Mesa Golf Course	Grand Junction	51 (Moderate)	Moderate	Light fuels, irrigated maintained yards, and hydrant systems.	WUI community, topography could generate more intense fire behavior.	No community-level plan.
Clifton Fire Department						
Fruitvale Wash areas	Clifton	78 (High)	Moderate with patches of high and extreme	Urban setting, hydrant water supply, close to fire department.	Thick riparian fuels, minimum separation between structures, lack of defensible space between homes backing on to wash.	No community-level plan.
Palisade Fire District						
Palisade	Palisade	79 (High)	Moderate with patches of high and extreme	Agricultural irrigated lands, good access, and hydrant system being replaced, close to fire department.	Thick riparian fuels along river and wash areas, minimal defensible space, combustible construction.	No community-level plan.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Horse Mountain	Unincorpo-rated	120 (Extreme)	High and extreme	Some homes have good defensible space, good separation between structures; some homes have new construction with low combustibility.	Poor accessibility intermixed with wildland fuels and heavy infestation of cheat grass, water unavailable, topographic influences, many homes fall outside the Palisade Fire District, history of fires.	No community-level plan.
Rapid Creek	Palisade	90 (High)	High and extreme	Recently annexed into Palisade Fire Protection District, some homes have new construction with low combustibility, hydrant system.	Poor access, intermixed with wildland fuels, topographic influences, minimal defensible space, and many wooden decks.	No community-level plan.
Central Orchard Mesa Fire District						
Central Orchard Mesa	Central Orchard Mesa	93 (High)	Moderate with patches of high and extreme along river	Good access for emergency vehicles, irrigated, close to fire department.	History of fire occurrence, thick fuels in wash areas, combustible siding and roofing, lack of defensible space, agricultural values at risk.	No community-level plan.
East Orchard Mesa Fire District						
East Orchard Mesa	East Orchard Mesa	85 (High)	Moderate with patches of high and extreme along river	Good access for emergency vehicles, irrigated, close to fire department.	Agricultural burning, lack of defensible space, upslope of brush fuels, agricultural values at risk.	No community-level plan.
Glade Park Volunteer Fire Department						
Miracle Rock Road Area including 9.8 Road, 8.4 Road, 7.5 Road and 5.7 Road	Glade Park	114 (Extreme)	High and extreme	Some BLM land interspersed with ongoing fuel treatment, flat to rolling topography.	History of high fire occurrence, thick continuous fuels, limited water supply, combustible construction.	No specific comments

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Miller Ranch/Elk Reserve Area including South end of 16.5 Road, Mabie Flats H 3/10	Glade Park	111 (High)	High and extreme	Good separation between structures, large lot sizes.	Steep grades, inaccessible roads, thick continuous fuels, some combustible buildings, minimal defensible space, empty lots not maintained.	No community-level plan.
Little Park Road	Glade Park	93 (High)	High/Extreme	Slightly lighter fuels than neighboring communities on lower portion, metal roofs and non-combustible siding common.	Limited water supply, poor defensible space, at distance from fire station.	Mixture of moderate and high risk. Implement defensible space, remove combustible materials, and improve driveway access.
Ladder Canyon Area, including 21.5 Road and Little Park Ranches, Rough Canyon Rim View	Glade Park	108 (High)	High and extreme	Good separation between structures, metal roofs and non-combustible siding common.	Inaccessible driveways, locked gates, minimal defensible space, limited water supply.	No community-level plan.
DS Road (all pinyon juniper dominated areas)	Glade Park	63 (Moderate)	Range of moderate–extreme (in areas with pinyon-juniper fuels)	Light grassland and agricultural fuels, large lots with good separation between structures, good accessibility.	Limited water supply and western portion is at considerable distance from fire station.	Mixture of moderate and high risk. Implement defensible space, remove combustible materials, and improve access.
Central Glade Park (sagebrush areas-1-mile radius of Glade Park Store, BS Rd, B ¼ Rd)	Glade Park	57 (Moderate)	Moderate/High (highest risk north of Glade Park store)	Lighter grassland fuels, grazing and some irrigation, minimal slope, good accessibility.	Some homes had minimal defensible space, fuels could experience fast moving wildfire due to open exposure.	No community-level plan.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Lower Valley Fire District						
Fruita	Lower Valley	56 (Moderate)	Moderate	Light fuels, some agricultural lands providing buffer to wildland, hydrant system, good accessibility.	Some combustible construction, limited separation between structures.	No community-level plan.
Fruita	Lower Valley	56 (Moderate)	Moderate	Light fuels, some agricultural lands providing buffer to wildland, hydrant system, good accessibility.	Some combustible construction, limited separation between structures.	No community-level plan.
Fruita Wash	Lower Valley	101 (High)	High and extreme	Hydrant system, close to fire station, good road network close by.	Heavy fuel volumes in drainage close to homes, inaccessibility for emergency vehicles, lack of defensible space.	No community-level plan.
Mack	Lower Valley	65 (Moderate)	Moderate	Agricultural and industrial intermix buffers wildland fuels, hydrant system, easily accessible.	Vacant lots with minimal maintenance, potential fire spread from surrounding brush/grassland.	No community-level plan.
Loma	Lower Valley	46 (Moderate)	Moderate with patches of high and extreme.	Large agricultural lots, good defensible space, easy accessibility.	Concerns related to fire occurrence, ditch burning.	No community-level plan.
Pollock Canyon Estates	Lower Valley	75 (High)	High with patches of extreme	Many homes built into mesa with low combustibility, homeowner's association for coordination.	Remote community, locked gate, poor accessibility within subdivision, medium fuels, no water supply.	No community-level plan.
Plateau Valley Fire District						
Vega Vista Road	Plateau Valley	139 (Extreme)	High and extreme	Close to lake for potential water supply and safe zone in event of evacuation, homeowner's association for coordinating efforts.	Some summer homes with limited maintenance, thick continuous fuels, homes on a slope, minimal to no defensible space, combustible construction, poor accessibility along driveways, minimal turnaround space.	Poor access for emergency vehicles, no surface water or hydrants, minimal vegetation management by absent homeowners. Recommend developing a wildfire awareness committee, implement defensible space/Firewise

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Horizon Estates	Plateau Valley	131 (Extreme)	Extreme	Some metal roofs, some defensible space development, and good access to main road.	Steep topography, community at top of slope, timber fuels and aspen decline occurring, many second homes with limited maintenance, access roads steep and narrow, minimal defensible space, no water supply but some ponds in vicinity.	Remote area, restricted access, no water supply, lack of maintenance, continuous brush fuels, 25% of homes have completed defensible space. Recommend homeowners initiate Firewise practices and formation of a wildfire awareness committee.
Aspen Park	Plateau Valley	124 (Extreme)	High and extreme	Newer construction homes, metal roofs, potential water supply from the lake.	Poor ingress/egress, dead end road, limited separation between structures, in timber fuels with declining aspen stands.	Poor or restricted access, many second homes with limited maintenance, no water supply. Homes moderate and high risk. Recommend creating a wildfire awareness committee, better address markers, and participation in Firewise.
Buzzard Creek Drainage	Plateau Valley	118 (Extreme)	Extreme	Potential water supply from lake and creek, good accessibility to main road.	Homes in drainage amongst heavy riparian fuels, poor accessibility due to locked gates and long steep driveways, and little defensible space, minimal set back from slope.	Restricted ingress, many homes moderate risk but some high risk due to heavy fuels, Recommend defensible space and thinning of brush, develop shelter in place and safety zones.
Vega Drainage (Grand Mesa Scenic Byway west of Mesa)	Plateau Valley	116 (Extreme)	Extreme	Potential water supply from lake, good accessibility to main road.	Homes in drainage amongst heavy riparian fuels, poor accessibility due to locked gates and long steep driveways, and little defensible space, minimal set back from slope.	No comments.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Powderhorn Ski Area	Plateau Valley	111 (High)	High and extreme	New construction homes, hydrant system, extensive road network, many homes have manicured lots.	Surrounding fuels are timber and aspen is declining, some homes have minimal defensible space, remote area at distance from fire station.	Thick brush and timber fuels, potential lightning ignitions, large areas of aspen decline, lack of defensible space. Recommend thinning of thick timber and brush, residents and businesses to implement defensible space.
Old Grande Mesa Road	Plateau Valley	109 (High)	High and extreme	Minimal homes and structures, Kiwanis camp has evacuation plan and water supply	Non surfaced steep grade road, heavy fuels and continuous canopies, topography could influence fire behavior.	Establish shelter in place locations and evacuation plan.
Mesa	Plateau Valley	103 (High)	Moderate and high	Good access to main road, close to fire station, hydrant system scheduled to be installed.	Homes situated above drainage with thick fuels, history of fire occurrence, poor defensible space, poor separation of structures.	Rated as moderate. No water supply, thick fuels. Recommend thinning, residents to implement defensible space.
Coon Creek	Plateau Valley	96 (High)	High and extreme	Some pastures and grasslands could act as safety zones, large lots with good separation.	Accessibility relatively poor, dead end road, defensible space is minimal, water availability is limited. Long driveways.	Poor access, limited water supply. Residents should expand defensible space and develop resident evacuation plan. Explore possibility for dry hydrants. Rated high–moderate risk.
Kimball Creek	Plateau Valley	95 (High)	High	Larger lots, more open farmland, BLM to treat adjacent lands with prescribed fire.	Some long, gated driveways, high fire occurrence, limited water supply, adjoins heavy wildland fuels.	High fire risk, remote location, no water supply, dense vegetation in creek area, gated driveways. Recommend residents verify addresses, landowners implement Firewise practices, development of a shelter in place and safety zone plan.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Molina	Plateau Valley	84 (High)	Moderate and high	Some grazing creating more open areas, close to fire station, good access to main road.	Steeper wooded topography, poor access to driveways, limited water supply, and defensible space is limited.	Lack of water supply, potential evacuation issues, dense fuels, rated high–moderate. Recommend creating fuel breaks along Highway 330, residents to implement defensible space, establish shelter in place.
Collbran/ Plateau City	Plateau Valley	54 (Moderate)	Moderate and high	Defensible space good in town, hydrant system, close to fire station.	Thick riparian fuels along Plateau Creek and Highway 330, some combustible construction.	Dense vegetation along Highway 330 and thick riparian fuels along Plateau Creek. Remove or reduce vegetation and ladder fuels along Highway 330. Develop evacuation plan.
De Beque Fire District						
De Beque	De Beque	67 (Moderate)	Moderate–high	Good accessibility, hydrant systems, light fuels in town.	Older combustible construction, minimal defensible space, heavier fuels in drainage.	No community-level plan.
South of De Beque	De Beque	47 (Moderate)	Moderate	Intermixed agricultural and pasture land, irrigated fuels good separation between structures, good accessibility.	Some combustible construction, adjacent to wildland fuels.	No community-level plan.

Community	Fire District	NFPA 1144 Score and Adjective Rating	GIS Composite Hazard/Risk Rating	Positive Features	Negative Features	Findings in Community CWPP
Lands End Fire Protection District						
Whitewater	Lands End	64 (Moderate)	Moderate with patches of extreme along railroad	Urban setting, light fuels, good access, close to fire department.	Hydrant system suffering low pressure, combustible construction, minimal separation between structures.	No community-level plan.
Kannah Creek	Lands End	82 (High)	High with patches of extreme	Large open pastures, good separation between structures, homes close to main road.	Water unavailable, combustible building materials, intermixed in thick wildland fuels, primary watershed for Grand Junction.	No community-level plan.
Purdy Mesa	Lands End	84 (High)	High and extreme	Large lots, good separation between structures, homes close to main road.	Exposed area to high winds, thick greasewood and cheat grass, water unavailable, combustible building materials.	No community-level plan.
Lower Reeder Mesa	Lands End	61 (Moderate)	Moderate	Minimal fuels, grazed, close to fire department, good separation between structures.	Combustible construction, water unavailable.	No community-level plan.
Upper Reeder Mesa	Lands End	96 (High)	High and extreme	Good accessibility, good separation between structures.	Intermixed with thick continuous wildland fuels, prone to high winds, water unavailable, and distance from fire department.	No community-level plan.
Gateway Unaweep Fire Protection District						
Unaweep Canyon	Gateway	96 (High)	High and extreme	New home construction has low combustibility, some grazed pasture land breaks up fuels and may provide safety zones, good access from main road.	Water unavailable, distance from fire department, homes adjacent to thick wildland and riparian fuels, little defensible space.	No community-level plan.
Gateway	Gateway	69 (Moderate)	Moderate and high	Close to fire department, hydrant water supply, good access, some new construction.	Combustible building materials, minimum separation of structures, lack of defensible space.	No community-level plan.

4.5 COMMUNITY HAZARD/RISK DESCRIPTIONS

The following is a breakdown of risk and hazard for communities by fire district. The intent of this section is provide more detailed information at a fire district level in order to aid prioritization of recommendations. Specific recommendations are included for each community. More general recommendations with implementation plans are provided in Chapter 5.

These community write-ups do not provide as much detail as a community-level CWPP and should not replace community-level planning.

A list of fire department apparatuses for each district is provided in Appendix D.

4.5.1 CENTRAL FIRE PROTECTION DISTRICTS

Figure 4.3 illustrates the risk assessment for the Grand Junction, Palisade, Clifton, East Orchard Mesa and Central Orchard Mesa Fire Districts. Table 4.3 lists proposed mitigation projects in the Grand Junction District.

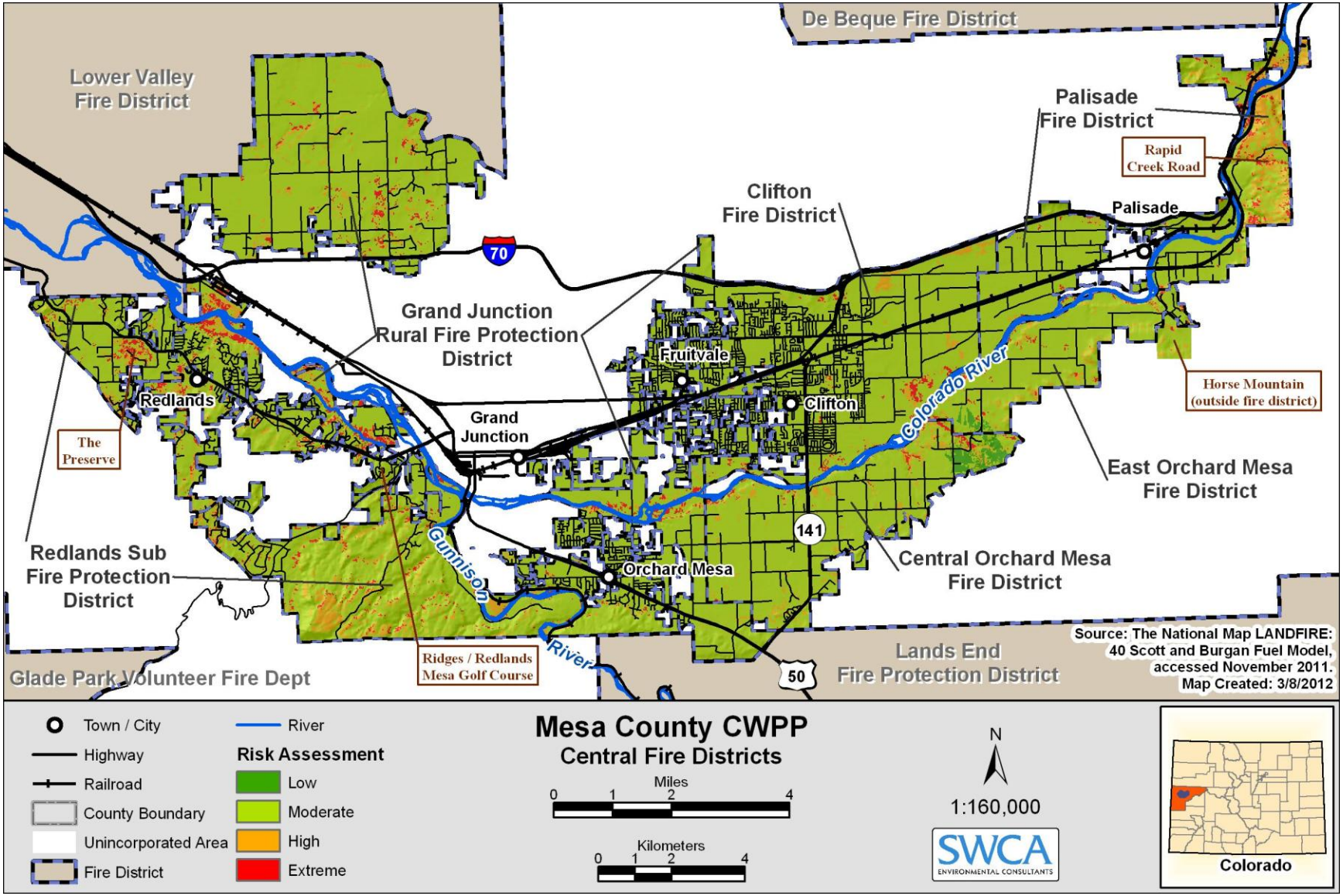


Figure 4.3. Risk assessment for the central fire districts.

4.6 GRAND JUNCTION FIRE DEPARTMENT- INCLUDING REDLANDS SUB FIRE PROTECTION DISTRICT AND GRAND JUNCTION RURAL FIRE PROTECTION DISTRICT

Firefighting Resources

There are 29 fire personnel on duty daily in the Grand Junction Fire Department, spread between five stations. All personnel are paid employees; there are no volunteer members. The majority of the fire district is urban developed land with low wildfire risk. The river corridor and the Redlands area that fall under the Redlands Sub Fire Protection District and the Grand Junction Rural Fire Protection District are the biggest concern for the fire department because of the nature of the fuels in those areas. There have been river bottom fires in the district every few years.

4.6.1 ORCHARD MESA

These are homes that are situated along the river bank in the Orchard Mesa portion of the city (Figure 4.4). This community is rated as high risk using this risk assessment protocol. The risk is associated mainly with a lack of defensible space around homes and combustible construction, including wooden siding and decks. The homes are situated with little set back from the slope and there are some heavy fuels below the homes creating the potential for fire to move from the river drainage upslope to the homes. Fuels are generally medium, made up of riparian cottonwood and saltcedar galleries with thick brush understories. Accessibility is good for most homes with surfaced roads, and sufficient turnaround space for emergency vehicles. Water is available from hydrants throughout the community and most homes are within 5 miles of the nearest fire station.

NFPA Rating: 77/112 (High) *GIS Assessment Rating: Moderate–extreme*

Figure 4.4. Orchard Mesa.

4.6.2 RIVER CORRIDOR

The remaining areas of the river corridor through Grand Junction were assessed collectively (Figure 4.5 and Figure 4.6). The river corridor was rated as high risk using this risk assessment protocol. The river corridor has river bottom fires every few years and is an area of concern for the fire department. Some areas have poor ingress/egress due to narrow roads or inaccessible driveways. Fuels were primarily medium, made up of riparian cottonwood galleries with thick

understory of saltcedar. The Tamarisk Coalition and the City of Grand Junction have been conducting some hazardous fuels treatments to remove invasive saltcedar from the area but some areas still remain in need of treatment. The density of the saltcedar makes it a potential fire hazard and a potential ladder fuel that would ignite native cottonwood. Many homes have little to no defensible space and combustible construction, including wooden siding and decks. During the summer the river corridor is heavily used by rafters and other recreationists visiting open space areas such as Watson Island. High visitor numbers provide potential ignition sources, particularly from campfires and cigarettes. The river is also frequented by transients who light campfires year-round, posing an additional fire hazard. Water is available from hydrants in some areas; where hydrants are absent, water could be drafted from the river.

NFPA Rating: 107/112 (High) *GIS Assessment Rating: High–extreme*

Figure 4.5. Watson Island Open Space.

Figure 4.6. River corridor.

4.6.3 REDLANDS

The Redlands area (Figure 4.7) was rated as high risk using this risk assessment protocol. Much of this risk is associated with a lack of defensible space around structures, combustible building construction medium fuels and limited water availability. The community is characterized by larger lots with larger homes and generally good separation between structures. The community is situated in the WUI with wildland fuels continuous with agricultural or residential fuels. Irrigated areas have less associated hazard; however, some areas have thick clumpy fuels with continuous canopies. Accessibility is typically good with moderately wide paved roads with sufficient turn-around space for emergency vehicles. Defensible space is a primary concern since many homes have less than 30 feet of defensible space around structures and many older homes have combustible construction, especially decks. Much of the area has only limited hydrants and many hydrants experience low pressure, diminishing their utility in the event of a wildfire; water would need to be transported to the area. There is significant public concern amongst Redlands residents regarding limited water supply and proximity of homes to wildland fuels and public open space, including homes adjacent to the Walter Walker State Wildlife Area (SWA) and the Leatha Jean Stassen SWA. The Redlands Village subdivision has united residents to pursue development of a more reliable water supply from the Ute Water Authority for firefighting, including developing a petition and holding neighborhood fire prevention meetings.

NFPA Rating: 105/112 (Extreme) *GIS Assessment Rating: Moderate–extreme*

Figure 4.7. Redlands home along edge of the mesa.

4.6.4 The Preserve

The community at the Preserve (Figure 4.8, Figure 4.9) was rated as high risk using this risk assessment protocol. The Preserve is a small community of larger homes in a private subdivision. The homes tend to be of newer construction with less combustible building materials and on average 30 to 70 feet of defensible space. Most homes have irrigated yards that provide defensible space however they are surrounded by thick riparian fuels of cottonwood, saltcedar, and Russian olive with continuous canopies that pose a considerable fire hazard. Accessibility is also a concern because some driveways are narrow and surrounded by heavy fuels. Some homes also have insufficient turn-around space for emergency vehicles. There is a history of fire occurrence in the area and fire spread between structures could be rapid due to limited separation between structures. The community has a system of hydrants throughout and good water availability, they are also located within 5 miles of the nearest fire station.

NFPA Rating: 75/112 (High) *GIS Assessment Rating: Moderate–extreme*

Figure 4.8. The Preserve.

Figure 4.9. Fuels at the Preserve.

4.6.5 The Ridges/Redlands Mesa Golf Course Community

The Ridges/Redlands Mesa Golf Course Community (Figure 4.10) was rated as moderate risk using this risk assessment protocol. Most homes in the Ridges area are located in light fuels with maintained yards. The homes in the Redlands Mesa Golf Course area are surrounded by irrigated and manicured yards with 30 to 70 feet of defensible space and light fuels that pose minimal hazard. The area is easily accessible with adequate access for emergency vehicles as well as plentiful water supply. Some homes do have combustible siding and decks but roof construction rates well in terms of combustibility. The topography in the area is a concern since steep terrain increases fire behavior and fire spread rates; in addition, wind-driven versus fuel-driven fire could be a concern because the community is located in the WUI where fire could move from heavier fuels towards the community. The urban and manicured nature of the area coupled with good accessibility and plentiful water supply would mitigate most hazards in this community.

NFPA Rating: 51/112 (Moderate) *GIS Assessment Rating: Moderate*

Figure 4.10. Ridges/Redlands Mesa Golf Course community.

Table 4.3. Proposed Mitigation Projects In the Grand Junction and Redlands Fire Districts

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Grand Junction Rural Fire Protection District, Grand Junction Fire Department, Redlands Sub Fire Protection District					
Colorado River Corridor, including Orchard Mesa	Public, Colorado River State Park, Colorado Division of Parks and Wildlife	**Install fire danger signage** utilizing NFDRS system along all access areas, picnic areas and campgrounds that make up the Colorado Riverfront Trail and James M. Robb Colorado River State Park.	Inform the public of high fire risk so as to reduce potential ignitions in the area.	High Summer 2013	Colorado State Parks, Mesa County, Colorado Division of Parks and Wildlife (Habitat Partnership Program as funding source), Mesa County. For funding sources refer to Appendix F.
		Fuel break projects. Create mowed areas or shaded fuel breaks along boundaries of public and private lands. See Figure 4.11 for location of Orchard Mesa fuel break.	Protect neighboring properties adjacent to public lands. Increase accessibility along trail system.	High Summer 2013	Colorado State Parks, Mesa County, Colorado Division of Parks and Wildlife (Habitat Partnership Program as funding source), Mesa County. For funding sources refer to Appendix F.
		Continue ongoing **saltcedar and Russian olive eradication projects** currently undertaken by City of Grand Junction and Tamarisk Coalition.	Remove hazardous fuels from WUI community. Restore native vegetation along a degraded river system.	High Ongoing efforts along entire corridor	Colorado State Parks, Mesa County, Colorado Division of Parks and Wildlife (Habitat Partnership Program as funding source), Mesa County. Colorado State Parks can apply for Great Outdoors Colorado funds for tamarisk removal.
		Defensible space projects around homes along boundary with river corridor and/or public lands. Utilize CSFS Defensible Space guidelines. Consider replacing wooden fencing with fire-proofed materials and or create buffer of non-vegetated area between private fence line and neighboring property.	Mitigate potential fire spread from river corridor and public lands onto private property. Protect homes and provide a safe area for fire suppression.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.
		Promote and encourage communities to host **neighborhood clean-up days** (in addition to spring clean-up within city limits). Have centralized deposit of green waste for collection and transport to composting facility.	Remove slash following community fuels reduction projects thereby reducing wildfire hazard and mitigating ongoing concerns that property owners dump slash along river corridor.	High Fall 2012	Homeowners, homeowner's associations, Mesa County, City of Grand Junction.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Redlands	Walter Walker SWA, Leatha Jean Stassen SWA - Colorado Division of Parks and Wildlife	**Fuel reduction treatments** along property lines (mowing, mechanical thinning), salt cedar eradication where it will aid in wildlife habitat protection throughout property. Fuel break projects on north and south side of river to protect homes from fire spread from wildlands. See Figure 4.12 for a map of the proposed treatment.	Protect neighboring properties along Wagon Trail Drive, Rushmore Drive, Chaco Court, McKinley Court, and Sand Castle Lane. Alleviate concerns voiced by the public from Redlands Village Subdivision.	High Summer 2013	Colorado Division of Parks and Wildlife in conjunction with residents of Redlands Village Subdivision. Consider creating a fuels reduction task force of volunteers. Colorado Division of Parks and Wildlife can apply for Great Outdoors Colorado funds for tamarisk removal, as well as the Habitat Partnership Program as a funding source. For funding sources refer to Appendix F.
	Private	**Hydrant expansion project** to increase coverage of hydrants in Redlands Village subdivision and ensure sufficient water pressure for proper operation.	Enhance firefighting capabilities. Alleviate concerns voiced by the public from Redlands Village Subdivision.	High Summer 2013	Ute Water Authority, Redlands Village Residents, Redlands Sub Fire Dept. For funding sources refer to Appendix F.
		Defensible space projects around homes. Utilize CSFS Defensible Space guidelines.	Mitigate potential fire spread from wildlands and public lands onto private property. Protect homes and provide a safe area for fire suppression.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.
Properties interfacing with Colorado National Monument (outlined in the Monument/ Glade Park and Redlands Interface CWPP (2008)	Private and NPS	Work with NPS fuels specialists to **coordinate fuel break development** along private/NPS boundaries as highlighted in the Glade Park-Redlands-Colorado National Monument CWPP. See Figure 4.13 for map of the proposed treatment.	Mitigate potential fire spread from the Monument onto private land and vice versa.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. NPS fuels specialists utilizing fuels treatment budget. For funding sources refer to Appendix F.
		Defensible space projects around homes. Utilize CSFS defensible space guidelines. Provide accompanying public education and outreach.			

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Grand Junction	Grand Junction Fire Department	**Enhance response** by purchasing a Type 3 WUI truck with short wheel base.	Aid in access of WUI areas along the river corridor.	Moderate Fall 2013	Grand Junction Fire Department.
		Pre-fire planning for river corridor access. Include mock incident.	Identify the most in-accessible areas and develop a plan to overcome access issues before a fire occurs.	High Spring 2012	
The Preserve	Private	**Defensible space projects** and combined community maintenance of roadside verges and access areas. Reduce overhanging vegetation around driveways.	Reduce fire risk around homes and limit potential spread between properties. Provides a safer area for firefighters to suppress fire.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
Ridges/ Redlands Golf Course	Private	Hold a **public outreach** event to inform residents about potential fire spread from wildland areas.	Raise awareness of fire risk in a community where perceived risk of fire is low.	High Fall 2012	Ridges/Redlands Golf Course.

Figure 4.11. Proposed fuel reduction and maintenance of riparian fuels along interface area between river and homes on Orchard Mesa. Red line denotes fuel break location.

Figure 4.12. Proposed Redlands Village fuel break with Walter Walker SWA. Red line denotes fuel break location, green area denotes mechanical fuel reduction that meets wildlife habitat quidelines.

Figure 4.13. Proposed fuel break treatment between homes and the Colorado National Monument. Red line denotes fuel break location.

4.7 CLIFTON FIRE DISTRICT

Firefighting Resources

The Clifton Fire District is made up primarily of urban developed land with minimal WUI areas. It is served by 15 paid full-time firefighters and 13 in-district and nine out-of-district volunteers.

Table 4.4 lists proposed mitigation projects in the Clifton Fire District.

4.7.1 FRUITVALE WASH AREA

The Fruitvale community is made up of mostly urban developed land with few wildland fire hazards and is therefore low risk. However, some of the wash areas that cut through residential streets are a concern to fire departments and are rated here separately as high risk. An example of this is on 31 Road, between E ½ and Peterson (Figure 4.14). These areas have good access for emergency vehicles but are dominated by thick heavy riparian fuels that are not maintained and are therefore choking the wash areas. In conjunction the riparian fuels are immediately adjacent to homes with less than 70 feet of defensible space. There is minimal separation between structures which could contribute to rapid fire spread. Most homes are constructed with combustible siding and decks and back yards are bordered by wooden fencing that is in direct contact with the wash area. The community is served by hydrants and is located within a mile of the nearest fire station.

NFPA Rating: 78/112 (High) *GIS Assessment Rating: Moderate–extreme*

Figure 4.14. Fruitvale area wash showing thick fuels backed up to homes.

Table 4.4. Proposed Mitigation Projects for the Clifton Fire District

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Clifton Fire Department					
Fruitvale	Private	Increase **public education and outreach** regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Reduce potential loss of structures and threat to life safety.	High Summer 2013	Clifton Fire Department. Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Develop a **community wildfire prevention group** to engage local volunteers in thinning efforts in the wash areas within subdivisions, and monitor re-sprouts in thinned areas to ensure the treatment is maintained. Organize community clean-up days to provide collaborative thinning effort and green waste removal.	Reduce hazardous fuels that are currently impinging upon residential areas and in direct contact with homes.	High Spring 2013	
		Implement **defensible space** around home following CSFS guidelines. Pay special attention to rear of property that adjoins wash areas. Consider replacing wooden fences with composite materials.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	

4.8 PALISADE FIRE DISTRICT

Firefighting Resources

The Palisade Fire District serves the community of Palisade and surrounding rural areas. The department has two full-full time paid firefighters and 35 volunteers.

Table 4.5 lists proposed mitigation projects in the Palisade Fire District.

4.8.1 PALISADE

The community of Palisade was rated as high risk using this risk assessment protocol. The greatest hazards are at the edge of the community in the WUI areas, particularly along the river corridor (Figure 4.15) and around wash areas. A large portion of the community is agricultural and hazards will be seasonable due to variable irrigation use throughout the year. Accessibility is good throughout much of the town but fuel concentrations in riparian areas are high and some pasture land is adjacent to flashy wildland fuel. There is minimal defensible space around most homes and homes are constructed from combustible siding, roofs, and decks. There is a hydrant water system throughout town; however, the hydrants have low water pressure and are currently being considered for replacement. Some of the larger wineries have sprinklers in their tasting rooms and warehouses but many do not. The area is subject to increased vehicle traffic and influx of visitors during certain times of the year (peach festival, wine tours, etc.), which could contribute to fire risk and concerns for evacuation in the event of a wildfire. The district currently has a lot of old apparatuses in the need of update. In addition the District Chief has been pursuing funding for a new fire station for the district for many years. The 1950s-era, 6,100-square-foot station next to Town Hall at 175 E. Third Street lacks sufficient space for equipment and crews.

NFPA Rating: 79/112 (High) *GIS Assessment Rating: Moderate–extreme*

Figure 4.15. Palisade river corridor showing homes upslope of thick fuels.

4.8.2 HORSE MOUNTAIN

The Horse Mountain community (Figure 4.16) was rated separately from the Palisade community because it is an area of concern to the Palisade Fire Department because of a recent large wildfire. The community is rated as extreme risk. Accessibility is poor throughout the

community due to unsurfaced roads and driveways and poor ingress/egress. Many street signs are present but not reflective. Fuels are medium brush fuels but there is heavy infestation of cheatgrass that increases fire risk (Figure 4.16). Homes are immediately adjacent to wildland fuels in an area with a history of wildfire. Topography is rolling and some homes are situated upslope of fuels. Most homes have combustible siding and decks though some homes have metal roofs. Water is unavailable in the area and would need to be hauled in, many homes fall outside the Palisade fire district, severely slowing response times to a fire. Some homes have implemented good defensible space and treated fuels in the vicinity of the home but most residents would benefit from implementing increased defensible space around structures.

NFPA Rating: 120/112 (Extreme) *GIS Assessment Rating: High–extreme*

Figure 4.16. Cheatgrass-Horse Mountain area.

Figure 4.17. Rapid Creek drainage.

4.8.3 RAPID CREEK DRAINAGE

The Rapid Creek area was rated as high risk using this risk assessment protocol. Homes are situated in thick pinyon-juniper (Figure 4.17) and have only minimal defensible space. The area is difficult to access due to steep and narrow, unsurfaced roads and some limited turnaround space for emergency vehicles. The steeper topography surrounding the creek can channel winds and is conducive to more extreme fire behavior. Homes in the area have recently been annexed into the Palisade Fire District and are within a mile of a station. Homes also have some water available from a hydrant system but water pressure is low. Home construction is good with more adobe construction, there are however wooden decks on most homes and pinyon-juniper close to structures.

NFPA Rating: 90/112 (High) *GIS Assessment Rating: High–extreme*

Table 4.5. Proposed Mitigation Projects in the Palisade Fire District

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Palisade Fire Department					
Palisade	Private	Increase **public education and outreach** regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Reduce potential loss of structures and threat to life safety.	High Summer 2013	Palisade Fire Department. In conjunction with local residents. Palisade local government. Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Develop a **community wildfire prevention group** to engage local volunteers in thinning efforts in the wash area, and monitor re-sprouts in thinned areas to ensure the treatment is maintained (Figure 4.18). Organize community clean-up days to provide collaborative thinning effort and green waste removal.	Reduce hazardous fuels that are currently impinging upon residential areas and in direct contact with homes.	High Spring 2013	
		Implement **defensible space** around homes following CSFS guidelines. Pay special attention to rear of property that adjoins wash areas. Consider replacing wooden fences with composite materials.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	
	Palisade Fire Department	Continue to seek funding/sponsorship to purchase **needed PPE** for all personnel	Ensure all volunteers have necessary equipment for safety.	High Summer 2012	Palisade Fire Department.
		Explore **in-house training opportunities** to assist volunteers in meeting necessary wildfire qualifications.	Alleviate financial burden of travel associated with wildfire training.	Moderate Spring 2013	
		Establish a **schedule for equipment replacement** to assist in scheduling grant applications.	Highlight the need for new and updated equipment to increase fire response capabilities.	Moderate Spring 2013	
		Continue to seek funding and assistance in **building a new fire station** for the District.	House the necessary resources for the District.	High Ongoing	

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Horse Mountain	Private	Increase **public education and outreach** regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Reduce potential loss of structures and threat to life safety.	High Summer 2013	CSFS, UCR, County Fire Warden.
		Develop a **community wildfire prevention group** to engage local volunteers in fire prevention efforts. Task group with: 1) Developing a community **evacuation plan** for people and livestock.	Provide coordinated effort in a community that falls outside of a fire protection district.	High Fall 2012	County Fire Warden, Palisade Fire Department.
		Organize **community clean-up days** to provide collaborative thinning effort and green waste removal.	Protect properties from fire spread and provide a safe area for fire suppression.	Moderate Ongoing	Homeowners. For funding sources refer to Appendix F.
		Implement **defensible space** around homes following CSFS guidelines.	Protect properties from fire spread and provide for safe fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.
		Treat **cheatgrass infestation** wherever possible. Utilize CSU Extension Services for best management practices.	Alleviate risk associated with a highly flammable vegetation. Assist in the removal of this non-native species from the ecosystem.	Moderate Ongoing.	Homeowners.
		Install a 30,000-gallon plus cistern in a safe area to augment water supply for tenders.	Provide a water supply for fire suppression.	Moderate Fall 2013	Homeowners, County Fire Warden.
Rapid Creek	Private	Increase **public education and outreach** regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Reduce potential loss of structures and threat to life safety.	High Summer 2013	CSFS, UCR, County Fire Warden.
		Implement **defensible space** around home following CSFS guidelines.	Protect properties from fire spread and provide for safe suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.

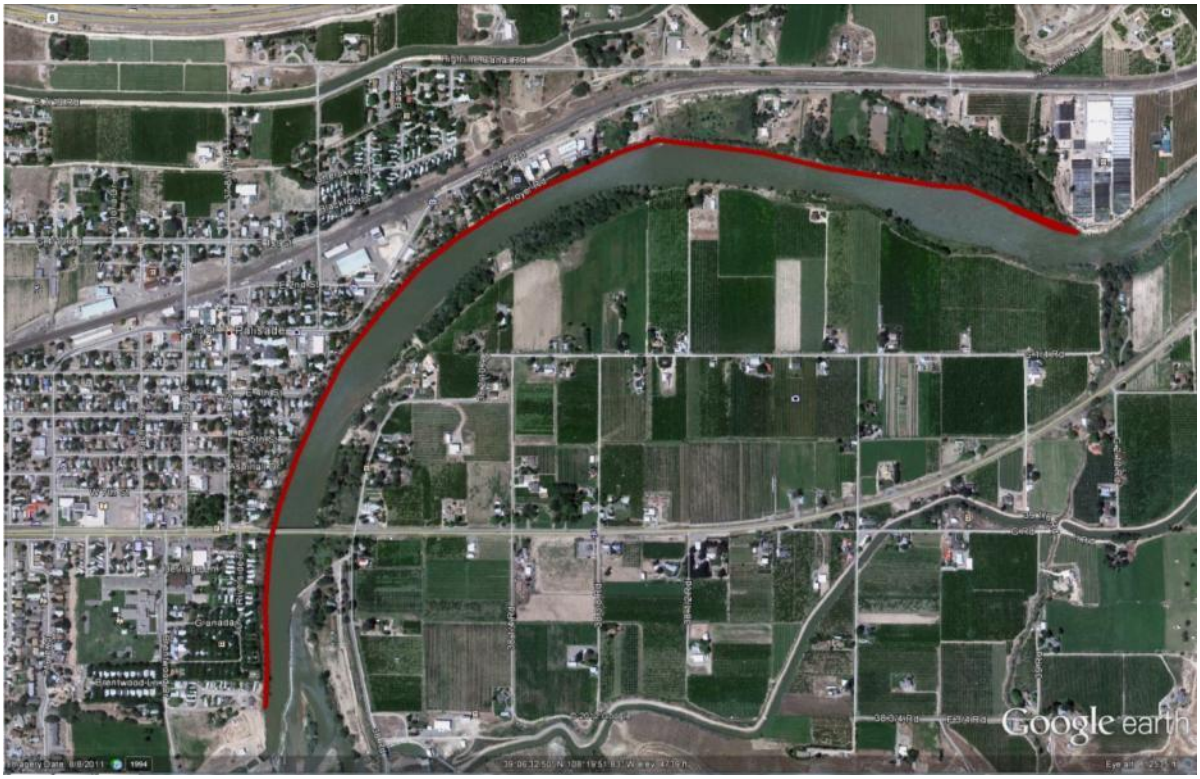


Figure 4.18. Proposed fuel treatment along river edge adjacent to homes in Palisade. Red line denotes treatment location.

4.9 EAST ORCHARD MESA FIRE DISTRICT

Firefighting Resources

The East Orchard Mesa Fire District is staffed entirely by volunteers.

Table 4.6 lists proposed mitigation projects in the East Orchard Mesa Fire District.

The East Orchard Mesa community is rated as high risk using this risk assessment protocol. The East Orchard Mesa Fire District is most concerned with the mesa top where homes are situated at the top of a slope above thick brush fuels (Figure 4.19). Most properties in this community are agricultural and have irrigated crops that would alleviate fire hazard throughout much of the year; however, this is seasonal and there has been some fire spread from agricultural burning of piles and slash. Many orchard properties do have an access road along the mesa edge that would serve as a fuel break and provide access to emergency vehicles but the community should engage in fuel reduction along the mesa edge and downslope of properties (Figure 4.20). Defensible space around homes is minimal and most homes have combustible construction, siding, and decks. The area is served by a hydrant system with variable water pressure, and most homes fall within a mile of the fire department.

NFPA Rating: 85/112 (High) *GIS Assessment Rating: Moderate–extreme*

Figure 4.19. East Orchard Mesa showing steep slope with orchards and homes on top and above fuels.

Figure 4.20. Proposed fuel removal and maintenance along mesa edge adjacent to East Orchard Mesa community.

Table 4.6. Proposed Mitigation Projects in the East Orchard Mesa Fire District

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
East Orchard Mesa Fire District					
East Orchard Mesa	Private	Increase **public education and outreach** regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Reduce potential loss of structures and threat to life safety.	High Summer 2013	East Orchard Mesa Fire District. In conjunction with local residents. Local government. Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Develop a **community wildfire prevention group** to engage local volunteers in clean-up efforts along mesa edge and slope (Figure 4.20). **Organize community clean-up days** to provide collaborative thinning effort and green waste removal.	Reduce hazardous fuels that are currently impinging upon residential areas and in direct contact with homes.	High Spring 2013	
		Implement **defensible space** around home following CSFS guidelines. Pay special attention to rear of property that adjoins river corridor. Consider replacing wooden fences with composite materials.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	

4.10 CENTRAL ORCHARD MESA FIRE DISTRICT

Firefighting Resources

The Central Orchard Mesa Fire District is staffed entirely by volunteers. The department currently has 12 members. The fire district covers approximately 8.1 square miles and includes 800 households with an estimated 2,700 residents.

Table 4.7. lists proposed mitigation projects in the Central Orchard Mesa Fire District.

Central Orchard Mesa was rated as high risk using this risk assessment protocol. The area has thick fuels particularly along riparian areas and washes. One area of concern for the Central Orchard Mesa Fire Department is Sink Creek, which has a history of fire activity and thick saltcedar downslope of a number of homes. A number of washes run close to residences with very little defensible space between wildland fuels and structures. Most properties in this community are agricultural and have irrigated crops that would alleviate fire hazard throughout much of the year; however, this is seasonal. Many homes are constructed from combustible materials and wooden decks are often located close to thick fuels (Figure 4.21). Homes are served by a hydrant system but water pressure is low and hydrants widely spread. Some homes are located with very little setback from the slope.

NFPA Rating: 93/112 (High) *GIS Assessment Rating: Moderate–extreme*

Figure 4.21. Property in the Central Orchard Mesa Fire District with a wooden deck close to thick fuels in a creek bottom.

Table 4.7. Proposed mitigation projects in the Central Orchard Mesa Fire District.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Central Orchard Mesa Fire District					
Central Orchard Mesa	Private	Increase **public education and outreach** regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Reduce potential loss of structures and threat to life safety.	High Summer 2013	Central Orchard Mesa Fire District. In conjunction with local residents. Local government. Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Develop a **community wildfire prevention group** to engage local volunteers in clean-up efforts along mesa edge, slope and wash areas. Organize **community clean-up days** to provide collaborative thinning effort and green waste removal.	Reduce hazardous fuels that are currently impinging upon residential areas and in direct contact with homes.	High Spring 2013	
		Implement **defensible space** around home following CSFS guidelines. Pay special attention to rear of property that adjoins river corridor. Consider replacing wooden fences with composite materials.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	

4.11 GLADE PARK VOLUNTEER FIRE DEPARTMENT

Glade Park is an unincorporated portion of the County and was identified by the Core Team and the public as an area of high fire hazard and risk. Figure 4.22 is the risk assessment for the department.

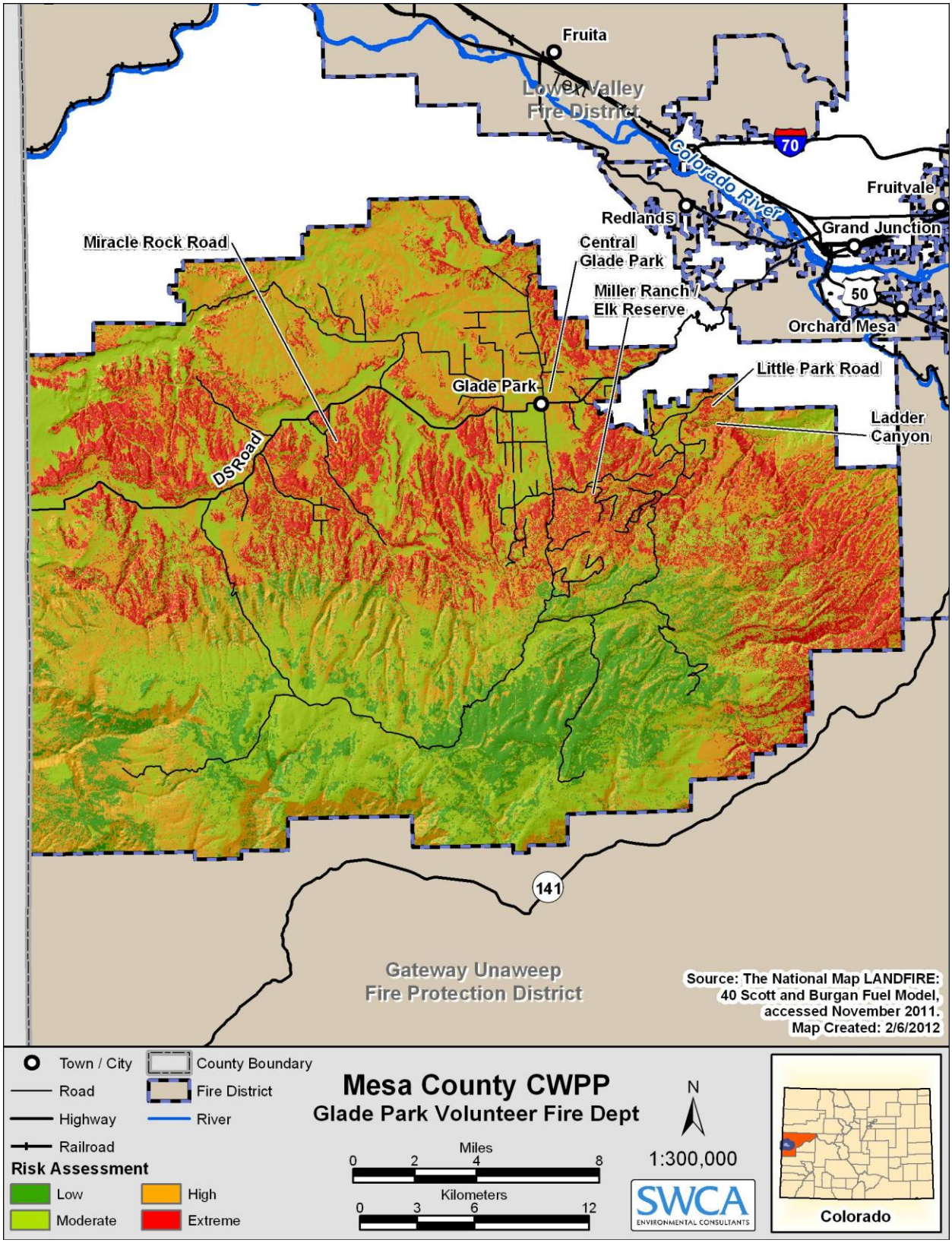


Figure 4.22. Risk assessment for the Glade Park Volunteer Fire Department

Firefighting Resources

The Glade Park Volunteer Fire Department is manned purely by volunteers funded by donations and fundraising efforts, including summer Movie Nights. Because it is a VFD, fire response times are contingent on the availability of members and the proximity of the fire to the fire department.

The Glade Park area was broken down into smaller communities based on similar terrain, building materials, and accessibility. Table 4.8 lists proposed mitigation projects in the Glade Park area.

4.11.1 Ladder Canyon

The Ladder Canyon area (Figure 4.23), including 21.5 Road and Little Park Ranches, Rough Canyon Road, and Rim View Drive, is rated as high risk using this assessment protocol. The community is made up of larger homes with private driveways, situated in thick pinyon-juniper woodland. The access roads were non-surfaced and rough in places and many homes had locked gates creating an accessibility issue for firefighters. There was little to no defensible space around homes and limited irrigation of surrounding vegetation. Most homes were constructed with metal or asphalt shingle roofing and non-combustible siding, though some had combustible decks. Water availability is limited to private wells or would need to be hauled to the site. There are no hydrants in the area. There is no homeowner's association (HOA) for this community.

NFPA Rating: 108/112 (High) *GIS Assessment Rating: High–extreme*

Figure 4.23. Ladder Canyon.

4.11.2 Little Park Road

This community made up of homes located along Little Park Road (Figure 4.24) is rated as high risk using this assessment protocol; however, it is a little more open than the Ladder Canyon community and is dominated more by grassland than pinyon-juniper fuels. There was little to no defensible space around homes and limited irrigation of surrounding vegetation. Most homes were constructed with metal or asphalt shingle roofing and non-combustible siding, though some had combustible decks. Water availability is limited to private wells or would need to be hauled to the site. The community is less than 5 miles from the nearest fire station and had good accessibility for emergency response. The road is surfaced and homes are more accessible from the main road.

NFPA Rating: 93/112 (High) *GIS Assessment Rating: High–extreme*

Figure 4.24. Little Park Road area.

4.11.3 Central Glade Park

The Central Glade Park community is made up of homes in the open grassland and sagebrush areas of Glade Park (Figure 4.25), close to the Community Center and Glade Park Store (BS Road and B ¼ Roads). The community is rated as moderate risk using this assessment protocol. The dominant fuel types are light grassland and agricultural fuels that are more open but can be prone to fast-moving wildfire particularly when cured or during drought. There is more grazing in the area, which tends to reduce fuel loading. Most homes were constructed with metal or asphalt shingle roofing and non-combustible siding, though some had combustible decks. Most homes had 70 100 feet of defensible space and were built on minimal slope. There are some hydrants in the area, improving water availability. The homes are located off of a main surfaced road with good accessibility to the nearest fire station.

NFPA Rating: 57/112 (Moderate) *GIS Assessment Rating: Moderate–high*

Figure 4.25. Central Glade Park.

4.11.4 Elk Reserve and Miller Ranch

Elk Reserve is the newer subdivision to Miller Ranch. The assessment area includes the South End of 16.5 Road, Mabie Flats Road, and H 3/10 Road (Figure 4.26). The area is rated as high using this risk assessment protocol. The Elk Reserve area is particularly high risk due to windy, narrow, and rough roads, with some steep grades and poor ingress and egress. Accessibility for fire trucks is extremely limited. There are currently many vacant lots indicating that there is potential for expansion of the area, though most lot sizes are more than 35 acres in size, leaving

good separation between adjacent structures. The topography is steep with small canyons. The fuels are made up of thick pinyon-juniper woodland with continuous canopies. Most new homes in the Elk Reserve community score well in terms of combustibility, being built with non-combustible siding or stucco and metal or asphalt shingle roofing. The Miller Ranch area is made up of older homes with some combustible building materials. Miller Ranch homes have better accessibility to the main road and better ingress and egress. Defensible space is minimal in both areas and most homes have limited setback from the slope. The Miller Ranch community has an HOA.

NFPA Rating: 111/112 (High) *GIS Assessment Rating: High–Extreme*

Figure 4.26. **Miller Ranch/Elk Reserve area.**

4.11.5 DS ROAD

The DS Road area includes all pinyon-juniper portions of Glade Park not rated as separate subdivisions (Figure 4.27). These areas were rated as moderate risk using this fire risk assessment protocol. The risk assessment was averaged along the DS Road from Glade Park to the Utah border. Fuels in the area range from light grassland and agricultural fuels to thicker pinyon-juniper. Lots tend to be larger with greater separation between structures. Accessibility is good with access from the main road. Some driveways, however, may be long and non-surfaced impacting ingress and egress for firefighters. Many homes have greater than 70 feet but less than 100 feet of defensible space. Water is limited in some areas and the most westerly portion of the area is greater than 5 miles from the nearest fire station.

NFPA Rating: 63/112 (Moderate) *GIS Assessment Rating: Moderate–Extreme*

Figure 4.27. DS Road facing west towards the Utah border.

4.11.6 MIRACLE ROCK AREA

The Miracle Rock area includes 9.8 Road, 8.4 Road, 7.5 Road, and 5.7 Road (Figure 4.28) and is rated as extreme using this risk assessment protocol. The community is characterized by large lots, big homes, and long driveways. Homes are situated in medium pinyon-juniper woodland fuels and more light open sagebrush. The area is dotted with private and BLM-managed lands in which the BLM has carried out some fuels treatments; the Colorado Division of Parks and Wildlife has also carried out sage-grouse (*Centrocercus urophasianus*) habitat improvements in the area that may mitigate fire spread. There is less than 30 feet of defensible space around most structures and few homes have irrigated yards. Most homes have combustible siding and decks and aboveground utilities, but there is good separation between structures due to lot size. Topography in the area is flat to rolling. There is a history of high fire occurrence in the area with more fire starts than other areas in the district. There is no available water in the form of hydrants so water would need to be transported into the area or drawn from stock ponds if available.

NFPA Rating: 114/112 (Extreme) *GIS Assessment Rating: High–Extreme*

Figure 4.28. Miracle Rock Road area.

Table 4.8. Proposed Mitigation Projects in the Glade Park Volunteer Fire Department Area

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Glade Park					
Glade Park	Glade Park Volunteer Fire Department	Encourage residents to **work with the BLM and NPS** regarding fuel treatment efforts along jurisdictional boundaries	Develop a landscape level fuels reduction effort that more effectively reduces fire risk in the WUI.	High Summer 2013	Glade Park Volunteer Fire Department. In conjunction with local residents. County Fire Warden.
		Pursue funding for **water storage** facilities and/or cisterns in communities with limited water supply	Facilitate fire suppression efforts.	High Spring 2013	
		Carryout **mapping of water supplies** on private lands- ponds, stock tanks etc	Facilitate fire suppression efforts.	High Spring 2013	
		Carry out annual **fire department recruitment drives.**	Increase volunteers and enhance fire response.	Moderate Ongoing	
	County Roads	Implement **road side thinning** along County Roads.	Keeps access roads clear so as to act as evacuation routes. Also reduces potential for ignition from human activity along the road system.	High Fall 2012	Mesa County Roads Department.
		Install fire danger signs along main roads and access roads to high risk communities. Utilize the NFDRS fire danger system.	Inform the public of the current fire danger in the area. Reduce human ignitions.	High Spring 2013	Mesa County Sheriff's Office, Mesa County Emergency Management.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Ladder Canyon, Little Park Road, DS Road, 16 ½ Road, Elk Reserve and Miller Ranch, Miracle Rock Road	Private	Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability (see Figure 4.29). Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.
		Develop a **community wildfire prevention group** to coordinate the development of an evacuation plan for residents and livestock.	Provide a coordinated effort in the community to protect life and property.	High Spring 2013	Homeowners, Glade Park Fire Department, County Fire Warden.
		Encourage residents to **work with the BLM, NPS, CSFS, and local fire department** regarding fuel treatment efforts along jurisdictional boundaries. Where possible, implement landscape-level treatments that include both private and BLM treatment areas.	Develop a landscape level fuels reduction effort that more effectively reduces fire risk in the WUI.	High Summer 2013	Homeowner, UCR, CSFS, and NPS. For funding sources refer to Appendix F.
		Install a 30,000-gallon plus cistern in a safe area to augment water supply for tenders.	Provide a water supply for fire suppression.	Moderate Fall 2013	Homeowners, County Fire Warden.

Figure 4.29. Example defensible space zoning for a home in Miller Canyon Area. The green area is intensive thinning; the green to red line is moderate thinning. Refer to CSFS defensible space guidelines, Section 5.2.1.

4.12 LOWER VALLEY FIRE DISTRICT

The Lower Valley Fire District encompasses 225 square miles ranging from the city limits of Grand Junction on the east all the way west to the Utah border. This area covers the Colorado National Monument to the south and continuing north to Douglas Pass, which is in Garfield County. The district also has an annual contract with Grand County, Utah, to cover 25 miles into Utah to Cisco. Figure 4.30 is the risk assessment for the fire district. Table 4.9 lists proposed mitigation projects for the district.

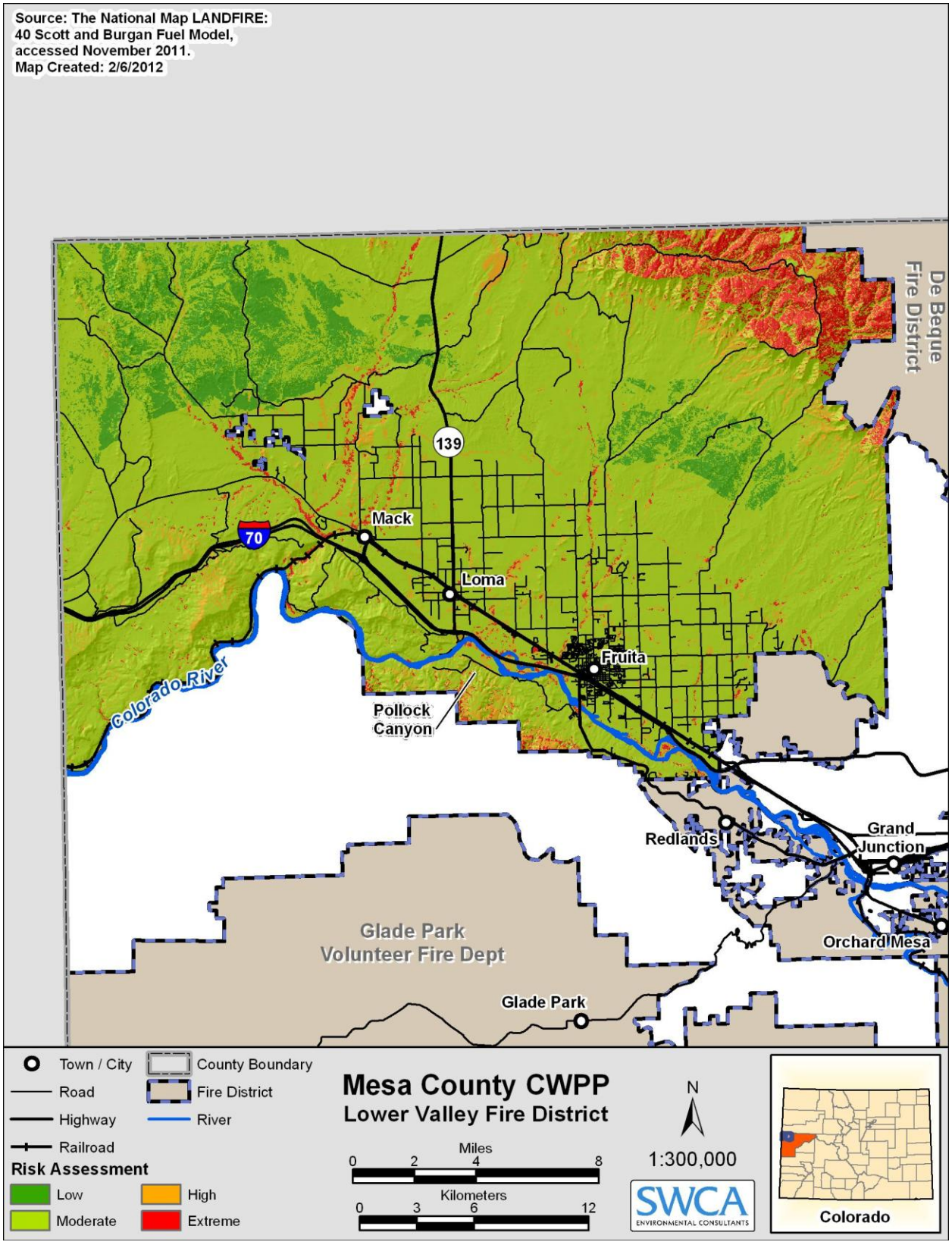


Figure 4.30. Risk assessment for the Lower Valley Fire District.

Firefighting Resources

The Lower Valley Fire District is a combination department comprising six full-time and 24 volunteer firefighters. The department is full-service handling, fire, Emergency Management System, hazardous materials, and technical rescue. The emphasis is on fire prevention through working closely with the City of Fruita and Mesa County Planning and Building Departments.

4.12.1 FRUITA

The city of Fruita was rated as moderate using this risk assessment protocol (Figure 4.31). The interface areas of the town are the areas of most concern. Accessibility is generally good throughout with good ingress/egress and turnaround space. Fuels are light in the interface areas, with some agriculture and grassland areas intermixed with homes. Most interface homes have between 30 and 70 feet of defensible space and light fuels in the yard. Many homes had combustible construction with wooden siding and decks. Water is readily available from hydrants and most homes in the Fruita area are situated within 5 miles of the fire department.

NFPA Rating: 56/112 (Moderate) *GIS Assessment Rating: Moderate*

Figure 4.31. Fruita.

4.12.2 FRUITA WASH

Main concerns for the Fruita Fire Department are the wash areas that run through the town on City of Fruita property (Figure 4.32 and Figure 4.33). Many homes directly adjoin these areas and HOAs have been working with the City of Fruita to remove some of the thick brush and riparian fuels, but large areas still remain untreated and pose a fire hazard. The wash areas were rated as high using this risk assessment protocol because of the fuel volumes, inaccessibility for emergency vehicles, lack of defensible space between them and the nearest structures, and combustible materials that would act as bridge fuels between the wash and residential structures, including wooden fencing and decks. There is some water availability from nearby hydrants.

NFPA Rating: 101/112 (High) *GIS Assessment Rating: High–Extreme*

Figure 4.32. Fruita Wash.

Figure 4.33. Fruita Wash.

4.12.3 Pollock Canyon Estates

Pollock Canyon Estates are located in the Lower Valley Fire District. The community is a gated subdivision and many of the homes are built into the side of the mesa (Figure 4.34). Those homes that are standalone tend to be constructed in adobe style with non-combustible materials. The community was rated as high using this risk assessment protocol. Most of the risk is associated with poor accessibility due to the remoteness of the community and road conditions throughout the subdivision, which are narrow and unsurfaced. There is no available water in the form of hydrants, water would need to be transported to the community in the event of a fire, and the nearest fire station is over 5 miles away, so response times could be slow. Fuels in the area are medium, predominantly pinyon-juniper and shrub fuels but with continuous canopies. Standalone homes often had only minimal defensible space. Homes built in the rock face would generally be non-combustible unless the fire burned up to the structure or entered as embers through vents or windows.

NFPA Rating: 76/112 (High) *GIS Assessment Rating: High–Extreme*

Figure 4.34. Pollock Estates.

4.12.4 Loma

The town of Loma is rated as moderate using this risk assessment protocol (Figure 4.35). Homes tend to be on larger lots with more irrigated agriculture in the interface areas. A main concern of

the fire department is agricultural and ditch burning and the potential for escape. Wildland fuels are sparse and light; however, the area has experienced wildland fires. Most homes have 70 to 100 feet of defensible space and irrigated lots. Agricultural fields act as a buffer to wildland fuels during the majority of the year; however, during periods of curing, crops could be a fire hazard. Most homes are easily accessible from the main road and are accessible for emergency vehicles. Water is available from hydrants in the town.

NFPA Rating: 46/112 (Moderate) *GIS Assessment Rating: Moderate–Extreme*

Figure 4.35. Loma.

4.12.5 Mack

The community of Mack (Figure 4.36) is rated as moderate using this risk assessment protocol. The interface community is made up of agricultural and industrial land intermixed with homes. Wildland fuels are light, made up primarily of a grassland shrub community. There are a number of vacant lots where fuel loading has the potential to increase with a lack of maintenance, and some thick brush fuels have developed posing a hazard to neighboring properties. Many homes have a lack of defensible space and have combustible construction, including wooden siding and decks. Water is available from hydrants and the community is easily accessible for emergency vehicles.

NFPA Rating: 65/112 (Moderate) *GIS Assessment Rating: Moderate*

Figure 4.36. Mack derelict lot.

In June each year the Fruita/Loma/Mack areas are host to the Country Jam, which is a four-day country music event in the area that attracts thousands of visitors to the area. The fire department works with the organizers to ensure that fire prevention procedures are followed prior to and during the event, but because of the increased population during the event there is always increased hazard and fire risk associated that should be planned for.

Table 4.9. Proposed Mitigation Projects for the Lower Valley Fire District

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Lower Valley Fire District					
Fruita	Lower Valley Fire District	**Hire a Deputy Chief/Fire Marshal** to build public outreach efforts and focus on fire prevention.	Tasks an individual to focus on fire prevention, freeing up time for the District Chief to focus on operations.	High Summer 2013	Lower Valley Fire District, in conjunction with local residents. County Fire Warden.
		Hire an **administrative assistant** to focus on grant applications for increased funding.	Additional funding can be used to purchase new equipment and pay for training volunteers.	High Spring 2013	
		Purchase a **software program** for mapping fire prevention and water infrastructure in the District. Develop and update mapping annually.	Facilitate fire suppression efforts.	High Spring 2013	
		Carry out **annual fire department recruitment drives.**	Increase volunteers and enhance fire response.	Moderate Ongoing.	
	Private	Implement **roadside thinning** along County Roads.	Keeps access roads clear so as to act as evacuation routes. Also reduces potential for ignition from human activity along the road system.	High Fall 2012	Mesa County Roads Department.
		Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Fruita Wash areas	Private and City of Fruita	Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Continue **collaboration with the Tamarisk Coalition** to reduce prevalence of saltcedar and Russian olive in wash areas and riparian areas throughout the community. Homeowners to coordinate with the City and fire department to develop defensible space between structures and wash. HOA groups should to continue to aggressively pursue thinning on City lands.	Help mitigate extreme fire behavior in timber fuels and reduce potential spread to communities adjoining the river. Build collaboration by working with variety of agencies, non-profits and local watershed groups.	Spring 2014 High	HOA groups, City of Fruita, Lower Valley Fire Department.
		Develop a **community wildfire prevention group** to engage local volunteers in thinning efforts in the wash area, and monitor re-sprouts in thinned areas to ensure the treatment is maintained (see Figure 4.37).	Provides volunteers for implementing actions outlined in the CWPP.	Moderate Fall 2013	HOA groups, City of Fruita, Lower Valley Fire District, homeowners.
Loma	Private	Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability.	Protect properties from fire spread and provide a safe area for fire suppression.	Moderate Fall 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Mack	Private	Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability.	Protect properties from fire spread and provide a safe area for fire suppression.	Moderate Fall 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		City to **target derelict lots** and enforce clean-up due to public safety concerns.	Reduce hazardous fuel loadings that are building up on derelict and abandoned lots.	Moderate Fall 2013	Mesa County.

Figure 4.37. Fruita Wash proposed fuels treatment area.

4.13 PLATEAU VALLEY FIRE PROTECTION DISTRICT

The Plateau Valley Fire Protection District (PVFPD) is located on the north east side of the County with elevations ranging from 6,000 to 10,000 feet. The district has a range of vegetation types from sagebrush and desert shrubs to high elevation subalpine fir. Most fire activity occurs in the pinyon-juniper woodland and Gamble oak shrublands, though some fires occur in agricultural areas related to ditch burning. Figure 4.38 is the risk assessment for the PVFPD. Table 4.10 lists proposed mitigation projects for the PVFPD.

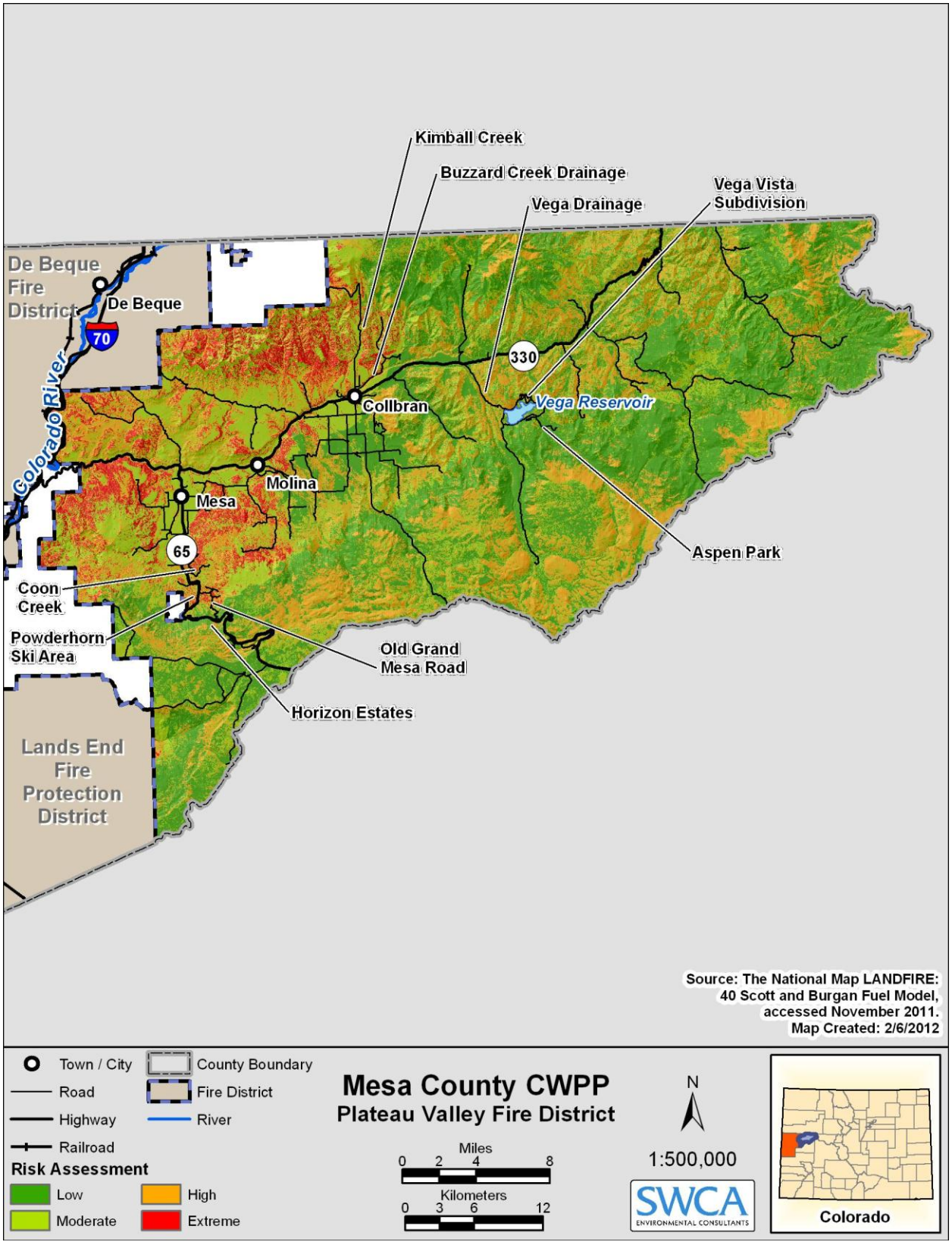


Figure 4.38. Risk assessment for the Plateau Valley Fire Protection District.

Firefighting Resources

The PVFPD has two full-time members, three part-time line positions, 14 to 15 active volunteers and 41 members on the roster, and 15 to 16 members are red-carded for wildfire. The PVFPD supports wildfire training by paying for the travel for the class.

According to the Fire Chief, the highest risk areas in the district are the Powderhorn area because of the numbers of values at risk. The Vega Vista community is a high risk community but many of the homes there are second homes. Two-thirds of the district is made up of public lands.

4.13.1 VEGA VISTA ROAD

The Vega Vista subdivision (Figure 4.39) is located on a bench on the north side of Vega Lake. The community is surrounded by Vega State Park. The community was rated as extreme using this risk assessment protocol. This subdivision has approximately 70 structures, with many full-time residents but some summer homes with reduced year-round maintenance. An HOA oversees maintenance of roads. Accessibility is a major concern in the area, particularly related to roads within the subdivision that are narrow, steep, and non-surfaced. There are numerous small drainages that run upslope, creating a chimney affect in the event of a wildland fire. Access to homes and suitable turnaround areas for fire trucks is limited. Fuels are moderate to heavy with some thick pinyon-juniper and oakbrush with continuous canopies. There is very minimal defensible space around homes and many homes have limited setback from the slope, which in some places is greater than 41% in gradient. Many homes have combustible construction with wooden siding and decks that overhang the slope and have vegetation growing above and below them. Direct water availability is limited but water could be drawn from the lake if necessary. The closest fire station is over 5 miles from the area. In the event of a fire, the district has an evacuation plan for residents to evacuate down to the lake shore. The area is known to have issues with landslides along the main road which could hinder evacuation away from the community. Amongst other recommendations, the Plateau Valley CWPP makes recommendations for a Vega Vista Wildfire Awareness Committee to coordinate fuel reduction efforts and defensible space activities with community members.

NFPA Rating: 139/112 (Extreme) *GIS Assessment Rating: High–Extreme*

Figure 4.39. Vega Vista subdivision.

4.13.2 Vega Drainage

The Vega Drainage area is located west of Vega Vista and Vega Lake; many of the homes are bordered by Vega State Park (Figure 4.40). The Plateau Valley CWPP makes numerous recommendations for wildfire mitigation for Vega State Park. The homes in this area were rated as extreme using this risk assessment protocol. Homes are dotted along the drainage in some thick fuels, including cottonwood and aspen. Accessibility is a concern due to limited ingress/egress along driveways, due to locked gates or narrow access; access to the main highway is good. There is very little defensible space around homes and most homes are located on or with very little setback to the steep slope. Some homes have combustible construction, including siding and decks. Direct water availability is limited but water could be drawn from the lake if necessary. The closest fire station is over 5 miles from the area.

NFPA Rating: 116/112 (Extreme) *GIS Assessment Rating: Extreme*

Figure 4.40. Vega State Park Visitor Center.

Photo credit: Kyle Compton

4.13.3 Aspen Park

The Aspen Park is a small community situated on the south side of Vega Lake (Figure 4.41). The community is rated as extreme using this risk assessment protocol. Homes are built in higher elevation timber, primarily in a dense aspen forest that is undergoing decline. Understory fuels are thick and act as potential ladder fuels. Access roads are non-surfaced with moderate slopes, impacting ingress/egress. There is only one way in and out of the subdivision via Park View Lane, therefore leading to a poor accessibility score. Most homes appear to be second homes with minimal vegetation management. Separation between structures is limited and there is very little defensible space around homes, though home construction tends to be newer with fewer combustible materials and mostly metal roof construction. Direct water availability is limited but water could be drawn from the lake if necessary. The closest fire station is over 5 miles from the area.

NFPA Rating: 124/112 (Extreme) *GIS Assessment Rating: High–Extreme*

Figure 4.41. Aspen Park.

4.13.4 BUZZARD CREEK DRAINAGE

The Buzzard Creek Drainage is located northeast of Collbran. The community is rated as extreme using this risk assessment protocol. Buzzard Creek has similar characteristics to the Vega Drainage, with some homes situated in the bottom of the drainage with poor ingress and egress due to narrow and sometimes gated driveways. The upper portion of the drainage supports mostly agriculture and is more open. Some homes are situated in thick fuels, including cottonwood and aspen with a thick brush understory and ladder fuels. There is very little defensible space around homes and most homes are located on or with very little setback to the steep slope. Some homes have combustible construction, including siding and decks. Direct water availability is limited but water could be drawn from Vega Lake and transported if necessary. The closest fire station is Collbran, and some homes fall over 5 miles from this station. The Plateau Valley CWPP makes numerous recommendations for the reduction of brush fuels in this community.

NFPA Rating: 118/112 (Extreme) *GIS Assessment Rating: Extreme*

4.13.5 KIMBALL CREEK

Kimball Creek is located north of the town of Collbran and is bordered by BLM lands to the east and west (Figure 4.42). The community was rated as high using this risk assessment protocol. The area is characterized as having larger lots with more open ranch and farm properties. There is some thicker pinyon-juniper and brush type fuels on the mesa interspersed among the grassland. Kimball Creek flows west of Kimball Creek Road and has some areas of thick riparian vegetation that pose a hazard to homes close in the drainage. Some homes have longer gated driveways with limited turnaround area for fire trucks and there is less than 70 feet of defensible space around most homes. Some homes had no address markers. The area experiences higher occurrences of wildfire than other areas and adjoins BLM land and heavier wildland fuels. The BLM performs annual prescribed burns each year to reduce hazardous fuels. Many homes have combustible construction, with wooden siding and decks. Water availability is limited with no hydrants in the area. The majority of the community is located greater than 5 miles from the nearest fire station.

NFPA Rating: 95/112 (High) *GIS Assessment Rating: High–Extreme*

Figure 4.42. Kimball Creek.

Photo credit Unitedcountry.com

Figure 4.43. Collbran area.

4.13.6 Collbran/Plateau City

The Collbran/Plateau City area (Figure 4.43) is rated as moderate using this risk assessment protocol. Collbran is the largest community in the valley with approximately 400 residents. This area is served by the Collbran Fire Department. The southern side of Colorado State Highway 330 that runs through Collbran is the area of greatest risk due to thick brush fuels. This area has been highlighted in the Plateau Valley CWPP as an area requiring hazardous fuels reduction. Homes located in the town of Collbran are generally rated low risk due to greater defensible space and road networks that break up wildland fuels. Areas of thick fuel along Plateau Creek pose fire hazard and risk to the north of the town. The communities have water availability from hydrants and the potential to draw water from Plateau Creek; they have good access to firefighting resources from Collbran. Most homes have approximately 30 to 70 feet of defensible space but some homes have combustible construction with wooden siding and decks. The Plateau Valley CWPP includes recommendations for fuels treatment along Colorado State Highway 330 to break up fuel continuity through the town of Collbran.

NFPA Rating: 54/112 (Moderate) *GIS Assessment Rating: Moderate–High*

4.13.7 Molina

Molina is an unincorporated community west of Collbran and Plateau City. The community is rated as high using this risk assessment protocol. This assessment concentrated on homes on the south side of the valley, along Colorado State Highway 330. Topography of this area is steeper and wooded. Access is good along the main road but some side roads and driveways are narrow and unsurfaced creating ingress/egress problems for emergency vehicles in the event of fire and/or evacuation. Fuels are moderate, made up of pinyon-juniper and grasslands, with some grazing, which lowers the fuel loading. Defensible space is limited around most homes, and some homes are located close to the slope and thick wildland brush fuels. Many homes are constructed with combustible materials, including wooden siding and decks. Water availability is noted as a concern in the Plateau Valley CWPP and recommendations are included to consider dry hydrant installation.

NFPA Rating: 84/112 (High) *GIS Assessment Rating: High*

4.13.8 Coon Creek

Coon Creek is a small subdivision located on the east side of Colorado State Highway 65 and bordered by BLM land to the east (Figure 4.44). The community is rated as high using this risk assessment protocol. Homes are situated on large parcels (~40 acres), with good separation between structures. The fuels in the subdivision are moderate to high, made up of thick oak brush and scattered pinyon-juniper. Some pastures and grasslands break up the continuity and could act as safety zones. Accessibility is relatively poor as roads are non-surfaced and poorly maintained in areas and there is only one way in and out. Homes are situated down long driveways hindering access by emergency vehicles. Defensible space is minimal around some homes. Water availability is limited, with no hydrants or municipal sources; however, fishing ponds may provide some limited supply in the event of fire. The Plateau Valley CWPP makes recommendations for improving defensible space and developing an evacuation plan.

NFPA Rating: 96/112 (High) *GIS Assessment Rating: High–Extreme*

Figure 4.44. Coon Creek.

4.13.9 Mesa

Mesa is an unincorporated community at the crossroads of Colorado State Highway 65 and KE Roads (Figure 4.45). The community is rated as high using this risk assessment protocol. To the east of the community is irrigated pastureland, and to the west is Mesa Creek drainage and rolling hills and pasture. The drainage has thick fuel build up of riparian fuels and cottonwood gallery. Many of the homes are situated above the drainage. The community experienced a wildfire in 2009 that spread from the creek upslope consuming two homes on the east side of the drainage (Figure 4.46). Accessibility is good in town, but homes that are situated down long steep driveways close to the creek have limited ingress/egress and poor access for emergency vehicles. Many homes have poor defensible space and combustible construction, including wooden siding and decks. New hydrants have been installed in the community. The Plateau Valley CWPP makes recommendations for homeowners to implement defensible space around homes, particularly those close to Mesa Creek.

NFPA Rating: 103/112 (High) *GIS Assessment Rating: Moderate*

Figure 4.45. Mesa.

Figure 4.46. Home destroyed in 2009 Mesa Creek Fire.

4.13.10 Old Grand Mesa Road

This road intersects Colorado State Highway 65 about 5.8 miles to the south of the town of Mesa and winds upslope to connect with Highway 65 two miles east of Powderhorn Ski Resort (Figure 4.47). The area is rated as high using this risk assessment protocol. There are a small number of structures along the road as well as the Kiwanis Summer Camp at the top of the slope on the southern end. The road is non-surfaced, narrow, steep, and winding and, due to limited turnaround space, would be difficult for emergency vehicles to access. Evacuation is also a concern and a number of plans should be developed to account for different fire locations. Fuels are medium to heavy, made up primarily of oak brush at lower elevations and mixed conifer and aspen at higher elevations. The area is steep and dissected with numerous small drainages that can channel fire spread. Most structures have been maintained for reduced combustibility with metal roofs and the Kiwanis Camp have carried out defensible space around most buildings. The camp has a natural spring as a water supply, as well as a swimming pool to draw water from in the event of a fire. The Plateau Valley CWPP makes recommendations for development of a shelter-in-place plan and evacuation planning for residents.

NFPA Rating: 109/112 (High) *GIS Assessment Rating: Extreme*

Figure 4.47. Grand Mesa.

Photo credit: Jim Loomis

4.13.11 HORIZON ESTATES

This estate is located to the east of Powderhorn Ski Resort in a high elevation mixed conifer forest setting (Figure 4.48). The community is rated as extreme using this risk assessment protocol. The community is situated at the top of a steep slope covered in continuous oak brush and pinyon-juniper woodland. Most homes are located within aspen stands that are currently undergoing decline. There is very little separation between homes and minimal defensible space around the majority of the homes. Some homeowners have carried out defensible space around their properties that may slow the spread of fire. Many homes are second homes with limited year-round maintenance. Many homes have poor construction with combustible decks and siding. Some homes have metal roofs. Access roads are extremely narrow with very little turn-around space for emergency vehicles. There is no water availability within the community but there are a few small ponds that water could be drawn from. The Plateau Valley CWPP makes recommendations for homeowners to implement Firewise practices in the community.

NFPA Rating: 131/112 (Extreme) *GIS Assessment Rating: Extreme*

Figure 4.48. Horizon Estates.

4.13.12 POWDERHORN SKI AREA

The Powderhorn Ski Resort is located in the southern portion of the PVFPD at an elevational range of 8,000 to 9,000 feet (Figure 4.49). The ski area is located outside the PVFPD boundary and is known as the Grand Mesa Metropolitan District #1 (GMMD). An Intergovernmental Agreement (IGA) has been established between the PVFPD and the GMMD. This IGA outlines emergency response services for the GMMD area, including wildfire response support. The resort and ski runs are located on USFS lands on the north face of the Grand Mesa. The Wildwood and Powder Ridge Estates are located adjacent to the ski area and the ski resort comprises a number of condos. The area is rated as high using this risk assessment protocol. The Powder Ridge and Wildwood Estates are made up of new construction with use of primarily non-combustible materials. Many homes, however, have minimal defensible space, but there is an extensive road network breaking up fuels and improving accessibility within the area. The community is remote and scores poorly on accessibility due to evacuation and emergency response delays. Surrounding fuels comprise mixed conifer and aspen, which are undergoing sudden aspen decline, creating increased fuel loading. Hydrants are available throughout the area but surface water supplies are limited. A surface pool for snow-making activities could be drawn from if necessary. The condo building does have internal sprinklers, but other buildings in the ski

resort do not. The Plateau Valley CWPP recommends defensible space activities around the resort structures.

NFPA Rating: 111/112 (High) *GIS Assessment Rating: Extreme*

Figure 4.49. Powderhorn Ski Area.

Table 4.10. Proposed Mitigation Projects for the Plateau Valley Fire Protection District

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Plateau Valley Fire Protection District					
Vega Vista Subdivision, Aspen Park (continued over page)	Private	Increase **signage along Highway 330** showing fire danger, evacuation routes and safety zones.	Alert residents and visitors of the high fire danger in the area and safe evacuation routes and safety zones.	High Summer 2013	Plateau Valley Fire Department, in conjunction with local residents. County Fire Warden. For funding sources refer to Appendix F.
		Create a **wildfire awareness committee** to help handle mailings and information to educate homeowners about wildfire risk and to collaborate with Vega State Park about evacuation and shelter in place plans, as well as joint purchase of clearing equipment with the park to be used on community work days.	Provide a united community effort for fire prevention.	High Spring 2013	
		Make sure all **address markers** are clear and visible.	Facilitate fire suppression efforts.	High Spring 2013	
		Implement **defensible space** around homes and fuels reduction projects between homes (Figure 4.50) and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	
		Implement a fuel break on the north and west edge of Vega Vista Subdivision (Figure 4.50), possibly extending west to BLM land on Campbell Mountain.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Vega Drainage	Private /State Park	Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Develop **shaded fuel breaks** on Vega State Park land along N 6/10 Road to reduce wildfire spread to Aspen Park subdivision and structures uphill. Implement a fuels reduction project on the south side of Aspen Park, utilizing mechanical thinning (Figure 4.51).	Prevent fire spread from State Park lands to neighboring residents.	High Fall 2012	Vega State Park.
		Develop **shelter in place** and safety zone agreements with the PVFPD in the event of a wildfire that restricts access and escape routes.	Provide a safe place for residents to shelter if they are un-able to evacuate during a wildfire.	High Spring 2013	Plateau Valley Fire Department, homeowners.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Buzzard Creek Drainage	Private/BLM	Property owners **to thin ladder fuels** and remove dead and downed material along roadsides.	Reduce hazardous fuels to mitigate extreme fire behavior and provide a safe evacuation route.	High Spring 2013	Homeowners.
		Reduce fuel loading using landscape level treatments on adjacent federal lands surrounding Kimball and Buzzard creeks.	Reduce large fire potential.	High Spring 2013	UCR.
		Develop **shelter in place** and safety zone agreements with the PVFPD in the event of a wildfire that restricts access and safety routes.	Provide a safe place for residents to shelter if they are un-able to evacuate.	High Spring 2013	Plateau Valley Fire Department, homeowners.
		Explore possibilities of installing **dry hydrants** at private ponds or above ground water sources.	Facilitate fire suppression efforts.	High Spring 2013.	Plateau Valley Fire Department, homeowners, County Fire Warden.
Kimball Creek	Private	Residents to **verify address** with Mesa County Assessor's office and post addresses clearly at residence.	Facilitate fire suppression efforts.	High Spring 2013	Homeowners.
		Landowners in the upper half of the PVFPD may consider establishing and maintaining ponds where possible and **installing dry hydrants** for potential fire suppression purposes	Facilitate fire suppression efforts as water is unavailable.	High Spring 2013	Homeowners.
		PVFPD to coordinate with landowners for **shelter in place** and staging locations for residents and livestock in the event that the northern half of the area cannot be evacuated.	Provide a safe place for residents to shelter if they are un-able to evacuate.	High Spring 2013	Plateau Valley Fire Department, homeowners.
Kimball Creek	Private	Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments.
	County Roads	**Reduce bridging fuels** on Kimball Creek road where the terrain becomes narrow, potentially restricting emergency vehicle access.	Provide a safe evacuation route for residents and emergency personnel.	High Spring 2013	Mesa County Roads Department.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Collbran /Plateau City	Private and County	Develop **evacuation plan** for the main portion of Collbran.	Provide a safe evacuation route for residents and emergency personnel.	High Spring 2013	Plateau Valley Fire Protection District, City of Collbran.
		Establish **safety zones** for sections of the community in the event of surrounding wildfire.	Provide a safe place for residents to shelter if they are un-able to evacuate.	High Spring 2013	Plateau Valley Fire Protection District, City of Collbran.
	Private	**Remove or reduce vegetation** and ladder fuels on the southeast side of the Highway 330 across from structures to break continuity of fuels (Figure 4.52).	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	City of Collbran.
		Reduce **vegetation bridging** Highway 330 where it becomes High Street between 2288 and 2019 High Street.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	City of Collbran.
		Complete **defensible space** for residences at the intersection of High Street at 58 ½ Road. Complete defensible space for residences on the north side of Spring Street and the north end of Plateau Avenue.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Utilize brush control herbicides wherever possible in oak and re-sprouting brush to mitigate re-sprouting of these plant species.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	City of Collbran
Molina	County	Create **fuel breaks** along Highway 330 and up the KE and LE ½ roads to provide safer access and reduce fuel continuity.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	Mesa County Roads Department.
	Private	Homeowners are encouraged to create maximum **defensible space** in dense brush covered slopes and Cottonwood Creek, and to implement Firewise construction were possible.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Fall 2012	Homeowners.
		Consider **installing dry hydrants** at private ponds.	Facilitate fire suppression efforts.	Moderate Fall 2013	Mesa County, PVFPD.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Coon Creek	Private	Establish and use **safety zones** for people and livestock.	Provide a safe place to shelter in the event that residents are unable to evacuate during a wildfire.	High Fall 2012	Homeowners, County Fire Warden, PVFPD.
		Develop **evacuation plan** for residents and livestock.	Access is a concern in the neighborhood so establishing more than one evacuation route is essential to life safety.	High Fall 2012	Homeowners, County Fire Warden, PVFPD.
		Explore possibilities for **dry hydrants** to be installed at private ponds on the east side of the subdivision.	Facilitate fire suppression efforts.	Moderate Spring 2013	Mesa County, PVFPD.
		Utilize **brush control herbicides** wherever possible in oak and re-sprouting brush to mitigate re-sprouting of these plant species.	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	Homeowners.
		Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
Mesa	Private and County	**Vegetation thinning and fuel breaks** are recommended to break up fuel continuity and protect structures at the top of the drainage (Figure 4.53).	Reduce hazardous fuels to mitigate extreme fire behavior.	High Fall 2012	Homeowners.
		Homeowners are encouraged to **verify addresses** with Mesa County Assessor's Office	Facilitate fire suppression efforts.	High Summer 2012	Homeowners.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Mesa	Private	Homeowners to implement **defensible space** recommendations on both the west side of town adjacent to Mesa Creek, as well as surrounding moderate risk houses along KE road to the east.	Reduce hazardous fuels to mitigate extreme fire behavior and provide a safe area for fire suppression efforts.	High Fall 2012	Homeowners.
Old Grand Mesa Road	Private	All residents are encouraged to **validate their addresses** with Mesa County Assessor's Office and clearly post addresses at end of driveways.	Facilitate fire suppression efforts.	High Summer 2012	Homeowners.
		Establish **shelter-in-place** locations and evacuation plan for residents and animals.	Provide a safe place to shelter in the event that residents are unable to evacuate during a wildfire.	High Fall 2012	Homeowners.
		Establish a shelter–in-place plan for the Kiwanis Summer Camp in the event that evacuation through the southern end of Old Grand Mesa Road is not available.	Provide a safe place to shelter in the event that residents are unable to evacuate during a wildfire.	High Fall 2012	Homeowners.
		Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Horizon Estates	Private	Residents should **verify their addresses** with the Mesa County Assessor's Office.	Facilitate fire suppression efforts.	High Summer 2012	Homeowners.
		Homeowners should initiate **Firewise Guidelines-** ensuring firewood is stacked at least 30 feet from the home, replace old flammable decks, screen vents, and opening around homes.	Protect properties from fire spread and provide a safe area for fire suppression.	High Fall 2012	Homeowners.
		The community could pursue becoming **a certified Firewise Communities USA.**	Provide impetus for carrying out defensible space and Firewise practices.	Moderate Fall 2013	Homeowners. Firewise Communities USA www.firewise.org.
		Homeowners should implement **defensible space** following CSFS guidelines particularly on the north side of the property which is upslope of thick wildland fuels.	Protect properties from fire spread and provide a safe area for fire suppression.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Explore possibility of installing **dry hydrants at** neighborhood lake.	Facilitate fire suppression efforts.	Moderate Spring 2013	Mesa County, PVFPD.
		Form a **Wildfire Committee** to act as wildfire education ambassadors for residents and second homeowners.	Unite homeowners in mitigation efforts. Provide a forum through which residents can develop evacuation plans and share fire prevention approaches.	High Summer 2012	Homeowners.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Powderhorn Ski Area	Private	Implement at least 100 feet of Zone 1 **defensible space** through the area immediately to the east of Golden Wood Condo area. Fuels should be thinned around Valley View and Golden Wood Condo areas.	Protect properties from fire spread and provide a safe area for fire suppression.	High Summer 2012	Property owners.
		Implement defensible space on the northern side of the Administration building.	Protect properties from fire spread.	High Summer 2012	Property owners.
		Implement a fuel break on the north side of Powderhorn Ski Area (Figure 4.54).	Protect properties from fire spread from the south.	High Summer 2012	USFS
		Increase **fire safety signage** around the resort and along access routes. Special event organizers should emphasis the fire danger message to visitors. Produce a fire danger and fire prevention leaflet for visitors.	Inform residents and visitors of the high fire danger in the area.	High Summer 2012	Property owners.
		Maintain grasses in the summer months, mow around buildings and around aboveground gas tanks.	Protect properties from fire spread and provide a safe area for fire suppression.	High Summer 2012	Property owners.
		Thin or remove dead standing and dead/downed trees in the forest to the south of gas tanks. The forested area is at the top of a densely vegetated drainage which is accumulating fuels.	Protect properties from fire spread and provide a safe area for fire suppression.	High Summer 2012	Property owners.
		Establish shelter in place and evacuation plans with the PVFPD as well as the USFS.	Provide a safe place to shelter in the event that residents are unable to evacuate during a wildfire.	High Summer 2012	PVFPD, USFS, property owners.
Throughout District	BLM/USFS	**Reduce fuel loading** using landscape level fuel treatments on adjacent federal lands.	Reduce large fire potential.	High Fall 2012	UCR.

Figure 4.50. Proposed Vega Vista subdivision fuel break and internal fuels reduction projects. Red lines denote fuel break location. Green area denotes thinning treatment between properties.

Figure 4.51. Proposed mechanical fuels reduction treatment on the south side of Aspen Park. Green area denotes thinning treatment.

Figure 4.52. Proposed fuels reduction treatment on south side of Colorado State Highway 330 west of Collbran. Green area denotes thinning treatment.

Figure 4.53. Proposed fuel treatment in Mesa Drainage. Green area denotes thinning treatment.

Figure 4.54. Proposed fuel break north and downslope of the Powderhorn Ski Area. Red line denotes fuel break location.

4.14 DE BEQUE FIRE DISTRICT

The County portion of the De Beque Fire District was included in this planning effort. This portion of the district is made up of a lot of mesa and sparsely vegetated land, as well as agricultural pasture land. The only communities that were assessed were the town of De Beque and the unincorporated areas south of I-70. Figure 4.55 is the risk assessment for the district. Table 4.11 lists the proposed mitigation projects for the district.

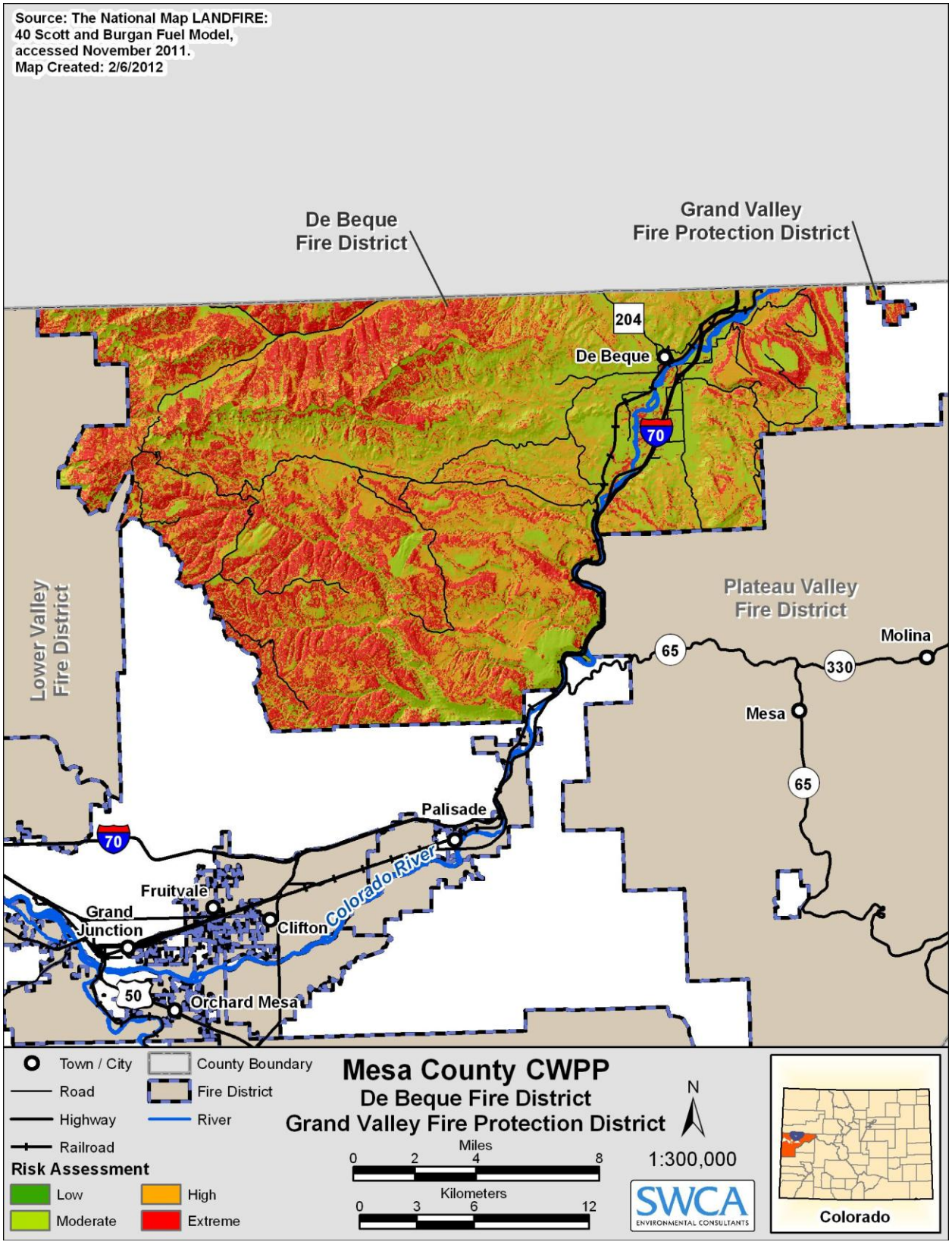


Figure 4.55. Risk assessment for the De Beque Fire District.

Firefighting Resources

The De Beque Fire Department has 16 full-time paid firefighters.

4.14.1 De Beque

The town of De Beque (Figure 4.56) was rated as moderate using this risk assessment protocol. The town is set among light sparse grassland fuels with some shrubby riparian fuels in drainages. Most homes are readily accessible for emergency vehicles from the main road and are situated close to the fire station, located in the center of town. There is water available from hydrants around the town. Many of the homes are older with combustible construction with wooden siding and decks and many have minimal defensible space; however, fuels are light and roads break up the fuel continuity. There is some oil and gas development west of the town but most pads are easily accessible for emergency vehicles and have good defensible space.

There are a number of housing development areas in the district including 35-acre parcels for sale in the 620-acre Mustang Ranch area, which is 12 miles west of De Beque and is surrounded by BLM lands. This subdivision was subdivided in 2009 and there are many travel trailers located on it. This area has very continuous pinyon-juniper and sagebrush fuels. There is very high wildfire occurrence here with several large fires over 100 acres in the last 20 years within a few miles. This subdivision is rated as extreme due to a lack of access, no water sources, unmarked lots, and very poor egress. There are no full-time residences so lot maintenance is limited.

Housing development should be periodically reviewed as they may increase the risk rating to the district in future years.

NFPA Rating: 67/112 (Moderate) *GIS Assessment Rating: Moderate–High*

Figure 4.56. The community of De Beque.

4.14.2 Southern De Beque District

The area south of I-70 and De Beque (Figure 4.57) is rated as moderate using this risk assessment protocol. This area is dominated by agricultural land and intermixed homes with considerable separation between structures. Most homes are located in flat areas with good accessibility from the main road. Agricultural lands are well irrigated and provide a buffer

between the wildland fuels and residential structures. Most structures have non-combustible roofs but some combustible siding and decks. Water is available from hydrants in the area and homes have good access to the fire station from the main road. Wildland fuels are light and sparse with rocky mesas and hillsides. Further south along the De Beque cut-off road the area is prone to high fire frequencies because of cheatgrass invasion. This area, however, has lower housing densities.

NFPA Rating: 47/112 (Moderate) *GIS Assessment Rating: Moderate*

Figure 4.57. Agricultural area south of De Beque.

Table 4.11. Proposed Mitigation Projects for the De Beque Fire District

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
De Beque Fire District					
De Beque	Private	**Implement road side thinning** along County Roads.	Keeps access roads clear so as to act as evacuation routes. Also reduces potential for ignition from human activity along the road system.	High Fall 2012	Mesa County Roads Department.
		Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Increase **public education and outreach** regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Protect properties from fire spread.	High Spring 2013	Homeowners, De Beque Fire Department.
De Beque cut-off road	Private	Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Mustang Ranch Subdivision	BLM	Reduce fuel loading using landscape level fuels treatments on adjacent federal lands.	Reduce large fire potential.	High	UCR.
	Private	Implement defensible space around homes and engage in Firewise activities to mitigate structural ignitability.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.

4.15 LANDS END FIRE PROTECTION DISTRICT

The Lands End Fire Protection District is served by a VFD based out of Whitewater. Figure 4.58 is the risk assessment for the district. Table 4.12 lists proposed mitigation projects for the district.

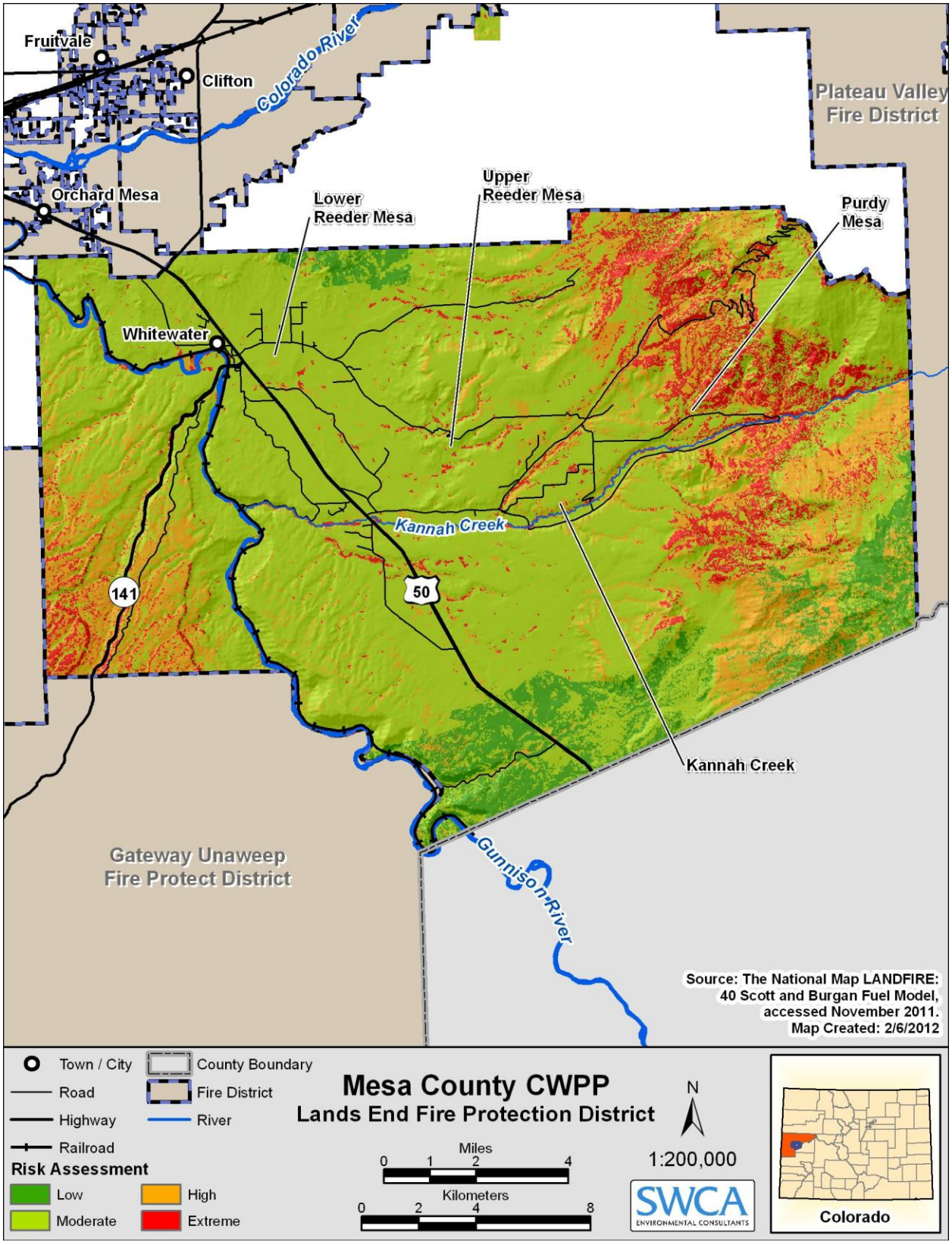


Figure 4.58. Risk assessment for the Lands End Fire Protection District.

Firefighting Resources

The Lands End Fire Protection District is staffed entirely by volunteers. The department has had problems in the past attracting volunteers but has recently initiated a recruitment drive to meet the goal of 25 active members. The VFD tries to retain volunteers by providing funding for training if volunteers stay with the department. The department has well-established mutual aid agreements with the neighboring Grand Junction Fire Department and Gateway Unaweep for fire response.

4.15.1 KANNAH CREEK

The community along Kannah Creek was rated as high using this risk assessment protocol. There are only a few homes along Kannah Creek with larger lots and some grazing that breaks up fuel continuity, but homes are dotted among wildland areas where fuels have built up over decades of fire suppression. The creek is also a primary watershed for Grand Junction and therefore a priority area for protection from catastrophic wildfire. The area has a history of fire starts (for example the 2008 Coal Creek Fire that started as a lightning strike, but was subsequently managed for resource benefit on Grand Mesa National Forest (Figure 4.59). The wildland fuels in the area are thick, particularly areas of greasewood in the valley and on the mesa top, which exhibits fast rates of spread when burned. Many homes also back up to thick riparian fuels in the drainage and along washes. Some newer homes have non-combustible construction (Figure 4.60) but wooden decks. Older homes tend to have combustible siding and roofs. Accessibility is a concern for the fire department because of long driveways and limited turnaround for emergency vehicles. There are some hydrants in the area but water pressure is extremely low and most water would need to be hauled in the event of a fire. Water supply is a particular concern of the fire department.

NFPA Rating: 82/112 (High) *GIS Assessment Rating: High–Extreme*

Figure 4.59. 2008 Coal Creek Fire burning through pinyon-juniper on Grand Mesa National Forest.

Photo Credit: Wildland Fire Lessons Learned Center

Figure 4.60. Kannah Creek home.

4.15.2 Purdy Mesa

The Purdy Mesa community was rated as high using this risk assessment protocol. Most properties on the mesa are larger lots with some small farms and grazing. Homes are dotted among wildland fuels with cheatgrass and greasewood posing a particular hazard. Some drainages have thick Russian olive and saltcedar often in close proximity to homes. Many homes have 70 to 100 feet of defensible space, though some have combustible siding and decks. In the event of a fire, water is unavailable and would need to be hauled in. Most fires in the area are agricultural burns and ditch burns, but a wildfire in the area may grow rapidly due to the exposed nature of the mesa and fast winds (Figure 4.61). Accessibility is generally good in the area with good access from the main road.

NFPA Rating: 84/112 (High) *GIS Assessment Rating: High–Extreme*

Figure 4.61. Purdy Mesa showing the patchwork of wildland and agricultural fuels.

4.15.3 Whitewater

The town of Whitewater was rated as moderate using this risk assessment protocol. The majority of homes are in an urban setting with no wildland issues (Figure 4.62). The greatest risk areas are homes on the edge of town that are adjacent to wildland fuels; however, these fuels are primarily light grasses and sparse vegetation with a lower fire hazard. Water supply is a concern for the fire department because water pressure in the hydrant system is so low that they are considered out of service. Many homes have combustible construction and minimal defensible space, but access is generally good and the fire department is located in town for rapid response.

NFPA Rating: 64/112 (Moderate) *GIS Assessment Rating: Moderate*

Figure 4.62. Urban area of Whitewater.

4.15.4 Reeder Mesa

The Reeder Mesa community was split between the lower valley portion with lower risk and the upper mesa portion, which exhibited higher risk due to changes in the fuel complex.

Lower Reeder Mesa

The Lower Reeder Mesa community was rated as moderate using this risk assessment protocol. Homes were on larger lots than Whitewater with very minimal surrounding fuels (Figure 4.63). Many homes had combustible construction but had good defensible space due to a lack of wildland fuels. Many lots were grazed increasing the vegetation management. There is no water supply in the area, so water would have to be hauled from Whitewater but the community is close to the Lands End Fire Department, providing more rapid response.

NFPA Rating: 61/112 (Moderate) *GIS Assessment Rating: Moderate*

Figure 4.63. Lower Reeder Mesa showing sparse vegetation.

Upper Reeder Mesa

The upper portion of Reeder Mesa was rated as high using this risk assessment protocol. The community is made up of larger lots with homes dotted among wildland fuels of thick and tall rabbitbrush and sagebrush. The area is prone to high winds and fuels are continuous in some areas causing concern for the Lands End Fire Department. Many homes are built with combustible construction and have very minimal defensible space (Figure 4.64); however, homes have good separation. There is no available water on the mesa, so in the event of a wildfire all water would need to be hauled in. Accessibility to homes is generally good but response times would be slow from Whitewater due to windy roads to access the mesa.

NFPA Rating: 96/112 (High) *GIS Assessment Rating: High–Extreme*

Figure 4.64. Home on Reeder Mesa showing thick brush fuels.

Table 4.12. Proposed Mitigation Projects for the Lands End Fire Protection District

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Lands End Fire Protection District					
Lands End Fire Protection District	Lands End Fire Department	Continue **recruitment drive** to increase pool of volunteers.	Improve response times and firefighting capability.	High Ongoing	Lands End Fire Department, County Fire Warden.
		Seek funding to assist volunteers in necessary **wildfire training.**	Ensure all firefighters have had adequate wildfire training to operate safely.	High Spring 2012	Lands End Fire Department, County Fire Warden.
		Seek grant funding for essential **PPE** for new volunteers.	Provides essential safety gear for all firefighters.	High Spring 2012	Lands End Fire Department, County Fire Warden.
		Seek funding to **purchase a 4x4** all-terrain vehicle for access to remote areas.	Enhances response to incidents in the WUI where access may be limited.	Moderate Spring 2013	Lands End Fire Department, County Fire Warden.
Kannah Creek and Purdy Mesa	Private	Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Increase **public education and outreach** regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Protect properties from fire spread.	High Spring 2013	Homeowners, Lands End Fire Department.
		Organize **community clean-up days** to provide collaborative thinning effort and green waste removal.	Facilitate clean-up of slash, reducing residual fuels.	High Spring 2013	

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Kannah Creek And Purdy Mesa	Private	Fire Department to work with homeowners **to assess access issues,** particularly relating to turnaround for emergency vehicles.	Facilitate fire suppression efforts by providing safe entry for emergency vehicles.	High Summer 2012	Lands End Fire Department, Homeowners.
		Develop a **water sources map** for the area to identify available water sources on private land, including ponds and wells.	Facilitate fire suppression efforts by coordinating- pre-fire, available water resources.	Moderate Spring 2013	Lands End Fire Department, Homeowners.
		Consider **installing a cistern (30,000-gallon plus)** in a safe area to augment water supply for tenders.	Facilitate fire suppression efforts by reducing times needed to shuttle water to incident.	High Spring 2013	Lands End Fire Department, Homeowners, County Fire Warden.
		Develop a **community wildfire prevention group** to engage local volunteers in thinning efforts and coordinate development of an evacuation plan for people and livestock.	Provides volunteers for implementing actions outlined in the CWPP. Ensures local residents are familiar with the proposed evacuation plan.	High Spring 2013	Lands End Fire Department, Homeowners.
Whitewater	Private	Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Increase **public education and outreach** regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Protect properties from fire spread.	High Spring 2013	Homeowners, Lands End Fire Department.
		Work with **water authority regarding water pressure issue;** cite public safety.	Provide adequate water supply to hydrant system.	High Summer 2012	Lands End Fire Department, Water District, Mesa County.

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Lower Reeder Mesa	Private	Consider **installing a cistern (30,000-gallon plus)** in a safe area to augment water supply for tenders.	Reduce time needed to shuttle water to incident.	Moderate Spring 2013	Homeowners, Lands End Fire Department.
		Develop a **water sources map** for the area to identify available water sources on private land, including ponds and wells.	Reduce time needed to shuttle water to incident.	Moderate Spring 2013	Homeowners, Lands End Fire Department.
Upper Reeder Mesa	Private	Consider **installing a cistern (30,000-gallon plus)** in a safe area to augment water supply for tenders.	Facilitate fire suppression efforts by reducing times needed to shuttle water to incident.	High Spring 2013	Lands End Fire Department, Homeowners, County Fire Warden.
		Develop a **community wildfire prevention group** to engage local volunteers in thinning efforts and coordinate development of an evacuation plan for people and livestock.	Provides volunteers for implementing actions outlined in the CWPP. Ensures local residents are familiar with the proposed evacuation plan.	High Spring 2013	Lands End Fire Department, Homeowners.
		Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
Entire District	BLM	Reduce fuel loading using landscape level fuels treatments Federal lands adjacent to private properties.	Reduce potential for large fires.	High Fall 2012	UCR.

4.16 GATEWAY UNAWEEP FIRE PROTECTION DISTRICT

Figure 4.65 is the risk assessment for the Gateway Unaweep Fire Protection District. Table 4.13 is a list of proposed mitigation projects for the district.

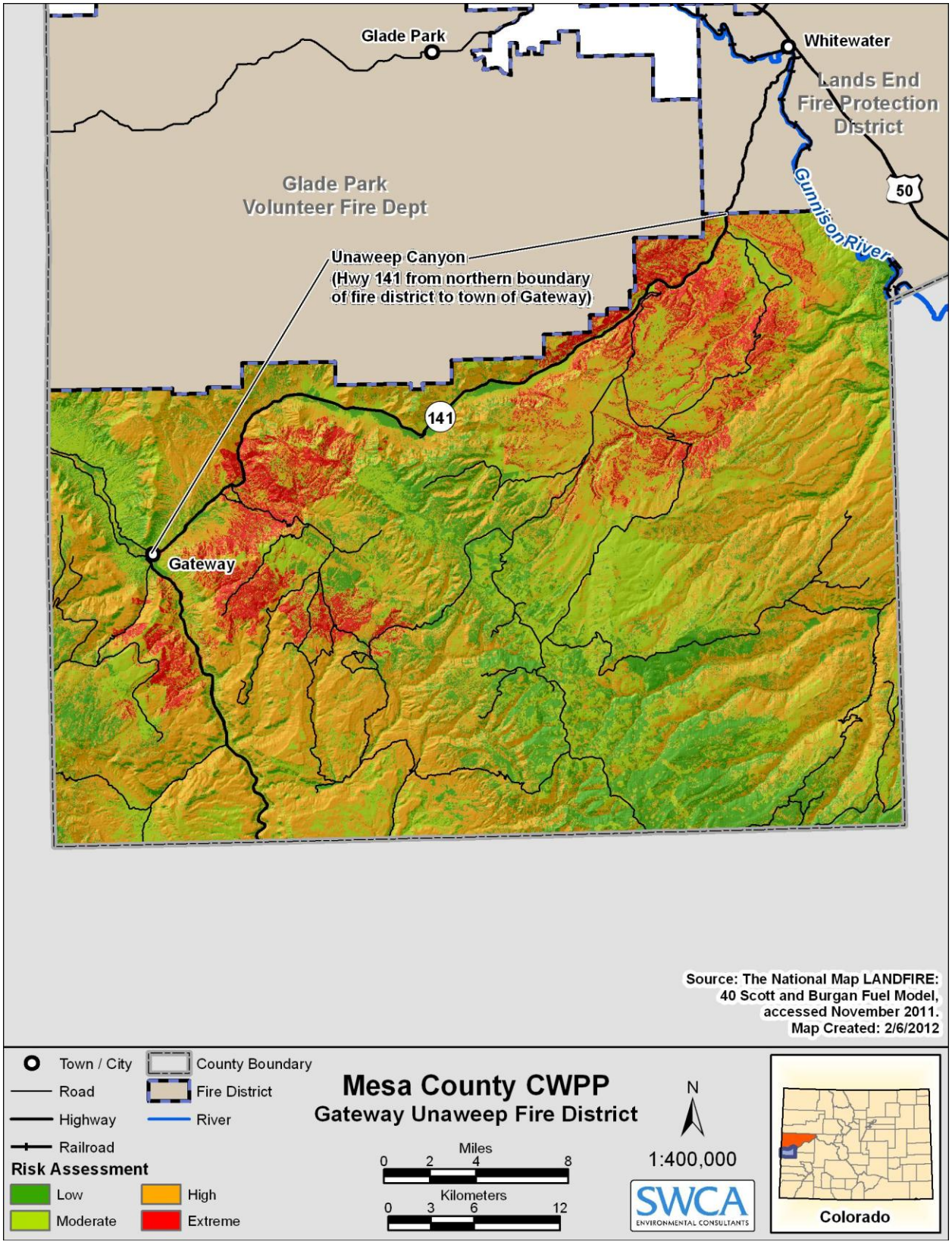


Figure 4.65. Risk assessment for the Gateway Unaweep Fire Protection District.

4.16.1 Unaweep Canyon

The community dotted along Unaweep Canyon was rated as high using this risk assessment protocol. Homes are situated on large lots among thick pinyon-juniper punctuated by some grazed pastureland (Figure 4.66). Some homes are also located close the river, adjacent to thick riparian fuels made up of Gambel oak, saltcedar, and cottonwood. Many newly constructed homes have non-combustible siding and roofs but older homes tend to have combustible siding and decks. There was very little defensible space around homes, though some properties have large pastures that could act as safety zones or slow the spread of wildfire to structures. There is no water available along the canyon so all water would need to be hauled from Gateway or drafted from the river. Many homes lie over 5 miles from the nearest fire department. The area is served by the Gateway Fire Department, which is a VFD.

NFPA Rating: 96/112 (High) *GIS Assessment Rating: High–Extreme*

Figure 4.66. Home in Unaweep Canyon showing proximity to pinyon-juniper fuels.

4.16.2 Gateway

The town of Gateway was rated as moderate–high using this risk assessment protocol. The community is made up of homes on smaller lots with the greatest risk being associated with home construction and combustible building materials. There is minimal separation between structures posing a risk for fire spread in the event of a wildfire entering the town. Many homes have limited defensible space, and some homes have poor yard maintenance. Some of the new commercial buildings in the town are made from stucco and xeroscaped, and therefore present low risk for wildfire. The community is surrounded by mesas and patchy pinyon-juniper fuels on the outskirts and grassland and riparian fuels along the river and wash areas (Figure 4.67). There is water supply via a hydrant system in town and the community is served by the Gateway Fire Department, also located in town.

NFPA Rating: 69/112 (Moderate–High) *GIS Assessment Rating: Moderate–High*

Figure 4.67. The community of Gateway showing light grass fuels in the foreground and riparian cottonwood fuels close to homes.

Table 4.13. Proposed Mitigation Projects for the Gateway-Unaweep Fire Protection District

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Gateway Unaweep Fire Protection District					
Unaweep Canyon	Private	Consider **installing a cistern (30,000-gallon plus)** in a safe area to augment water supply for tenders.	Facilitate fire suppression efforts by reducing times needed to shuttle water to incident.	High Spring 2013	Gateway Unaweep Fire Department, Homeowners, County Fire Warden.
		Develop a **community wildfire prevention group** to engage local volunteers in thinning efforts and coordinate development of an evacuation plan for people and livestock.	Provides volunteers for implementing actions outlined in the CWPP. Ensures local residents are familiar with the proposed evacuation plan.	High Spring 2013	Gateway Unaweep Fire Department, Homeowners.
		Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
		Increase **public education and outreach** regarding structural ignitability. Promote Firewise practices outlined in Chapter 5.	Protect properties from fire spread.	High Spring 2013	Homeowners, Gateway Unaweep Fire Department.
Gateway	Private	Develop a **community wildfire prevention group** to engage local volunteers in thinning efforts and coordinate development of an evacuation plan for people and livestock.	Provides volunteers for implementing actions outlined in the CWPP. Ensures local residents are familiar with the proposed evacuation plan.	High Spring 2013	Gateway Unaweep Fire Department, Homeowners

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Gateway	Private	Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines.	Protect properties from fire spread and provide a safe area for fire suppression.	High Spring 2013	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.
Entire district	BLM	Reduce fuel loading using landscape level fuels treatments on Federal lands adjacent to private properties.	Reduce potential for large fires.	High Fall 2012	UCR.

4.16.3 UNINCORPORATED AREAS OF MESA COUNTY

Grand Junction and Palisade Watersheds

At-risk areas in unincorporated regions of Mesa County include the municipal watersheds of the City of Grand Junction and the Town of Palisade, as well as the area known as Pinyon Mesa (technically within the response area of Glade Park VFD). The City of Grand Junction, in conjunction with the USFS, completed an Environmental Assessment (EA) of the city's watershed in 2008. Fuels within the Grand Junction Watershed consist primarily of decadent stands of pinyon-juniper and oakbrush. The EA characterized the city's watershed as being at high risk of a catastrophic fire event that could have potentially devastating effects on the water supply within the Kannah Creek basin, which is the primary source of domestic water for over 40,000 Grand Junction city residents (USFS 2008). Likewise, the Town of Palisade completed a Watershed Fire Mitigation Plan in 2009. Palisade's watershed is composed of extensive oakbrush and pinyon-juniper woodlands that are at high risk of catastrophic fire (Robertson 2009) (Figure 4.68). More details regarding both watersheds are provided in Section 5.3.5. Proposed mitigation projects are included in table 4.14.

GIS Assessment Rating: High–Extreme

Figure 4.68. Continuous pinyon-juniper fuels in the Palisade Watershed.

Pinyon Mesa

The Pinyon Mesa area is situated above and south of Glade Park. Vegetation on Pinyon Mesa is a mix of oakbrush, pinyon-juniper woodlands, ponderosa pine, and aspen. There are scattered summer homes, hunting cabins, and ranch buildings on the private land portions on Pinyon Mesa that are at moderate risk to wildfire, due to lack of defensible space clearing and poor access.

GIS Risk Assessment Rating: High–Extreme

West Divide and Alkali Creeks

Located at the extreme east end of Mesa County the West Divide and Alkali Creek drainages have scattered cabins, lodges, and ranches. The vegetation is mostly oakbrush and other mixed mountain shrub with aspen and other conifers at higher elevations. This area is at high risk due continuous fuels (Figure 4.69) and long response times for fire resources. Other values at risk

include significant natural gas development in the form of wells, pipelines, and compression stations.

GIS Risk Assessment Rating: High–Extreme

Figure 4.69. Fuels in West Divide drainage.

Housetop Mesa

The Housetop Mesa Estates is in Mesa County adjacent to Garfield County on the north side of the Battlements, southwest of Parachute, Colorado. This 11-home subdivision is intermixed with thick continuous pinyon-juniper vegetation. Due to vegetation, lack of defensible space, and long response time for emergency responders, this area is rated extreme. Several large fires over 100 acres have occurred west of here in the past five years.

GIS Risk Assessment Rating: High–Extreme

Table 4.14. Proposed Mitigation Projects for the Unincorporated Areas of Mesa County

Community	Landownership/ Management	Project	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Responsibility
Unincorporated Areas of Mesa County					
Municipal Watersheds	Private/USFS/ BLM	Continue fuel reduction vegetation thinning on BLM and USFS lands	Reduce hazardous fuels to mitigate extreme fire behavior.	High Spring 2013	UCR.
Pinyon Mesa, West Divide, Alkali Creek, Housetop Mesa	Private	Implement **defensible space** around homes and engage in Firewise activities to mitigate structural ignitability. Provide accompanying public education and outreach regarding CSFS defensible space programs and guidelines. Organize for a CSFS representative to visit properties and advise on defensible space strategies.	Protect properties from fire spread and provide a safe area for fire suppression.	High Fall 2012	Homeowners. Apply for landowner assistance grants from CSFS for defensible space treatments. For funding sources refer to Appendix F.

4.17 COMMUNITY VALUES AT RISK

Earlier compilation of the critical infrastructure in the planning area (Map 7, Appendix A), coupled with the community assessments, public outreach, and Core Team input, has helped in the development of a list of CVARs from wildland fire. In addition the 2010 Mesa County Hazard Mitigation Plan identifies critical facilities and infrastructure in the County. Since these facilities are critical for emergency response to wildfire, they are also included in this plan (Table 4.15) so that they may be prioritized for protection.

Table 4.15. Critical Facilities and Infrastructure as Identified in the 2012 Mesa County Hazard Mitigation Plan

Facility Type	Unincorporated Mesa County	Grand Junction	Collbran	Palisade	Fruita	De Beque
Ambulances	7	7	2	2	3	2
Bridges	104	27	3	-	6	1
Dams	47	1	-	-	-	-
Emergency Operations Center	1 (not 24/7)	-	-	-	-	-
Communication towers	40	21	1	-	1	-
Fire stations	6	5	2	1	2	1
Government buildings	-	14	1	1	1	1
Helicopter staging	-	1	-	-	-	-
9-1-1 communications centers	-	1	-	-	-	-
Medical facilities	-	3	-	-	1	-
Schools District 51 Private	 15 3	 19 5	1	2	5	1
Water-wastewater facilities	1	1	1	1	1	1
Colleges/Universities	-	1	-	-	-	-
Airports	-	1	-	-	-	-

Source: Table taken from the Mesa County Hazard Mitigation Plan (2010) - data source listed as Northwest All Hazard Emergency Management Region Data.

In addition to critical infrastructure, CVARs can also include natural, social, and cultural resources. It is important to note that although an identification of CVARs can inform treatment recommendations, a number of factors must be considered in order to fully prioritize areas for treatment; these factors include appropriateness of treatment, land ownership constraints, locations of ongoing projects, available resources, and other physical, social, or ecological barriers to treatment.

The scope of this CWPP does not allow determination of the absolute natural, socioeconomic, and cultural values that could be impacted by wildfire in the planning area. In terms of socioeconomic values, the impact due to wildfire would cross many scales and sectors of the economy and call upon resources locally, regionally, and nationally. To understand the breadth of such an impact, land agencies and local communities may guide efforts towards completing a comprehensive economic and demographic analysis in relation to wildfire impacts. This CWPP may be used to identify priority areas and communities that could experience the greatest economic strain. It is suggested that communities included in the MCCWPP achieve a finer-grained analysis of the smaller jurisdictional and community wildfire concerns by pursuing further funding to complete a community-level CWPP.

4.17.1 NATURAL CVARS

The public outreach has emphasized the importance of natural/ecological values to the general public. Examples of natural values identified by the public and the Core Team include:

- Colorado River ecosystem
- Gunnison River ecosystem
- Natural areas
- Native species
- Wildlife habitat
- Threatened and endangered Species (terrestrial) -
    - Boreal toad (*Bufo boreas*), state endangered
    - Bald eagle (*Haliaeetus leucocephalus*), state threatened
    - Least tern (*Sterna antillarum*), federal endangered, state endangered
    - Plains sharp-tailed grouse (*Tympanuchus phassianellusjamesii*), state endangered
    - Southwestern willow flycatcher (*Empidonax traillii extimus*), federal endangered, state endangered
    - Whooping crane (*Grus americana*), federal endangered, state endangered
    - Kit fox (*Vulpes macrotis*), state endangered
    - Lynx (*Lynx canadensis*), federal endangered, state endangered
    - River otter (*Lontra canadensis*), state threatened
    - Wolverine (*Gulo gulo*), state endangered
- Wetland areas
- Ranchland
- Air quality
- BLM Areas of Critical and Environmental Concern (Bullen and Martsolf 2010)
- Colorado Natural Heritage Program Potential Conservation Areas (as described in the 2010 Mesa County Hazard Mitigation Plan [source: Colorado Natural Heritage Program 2009])

4.17.2 SOCIOECONOMIC CVARS

Social values include population, recreation, infrastructure, agriculture, and the built environment. Much of the built environment in the planning area falls within the WUI zones. Examples include the following:

- Agricultural lands
- Churches
- Ranchlands
- Utility lines, infrastructure, etc.

- Fire departments
- Railroad bridges
- Highways
- Wells, pipelines, and other related infrastructure
- Water storage

4.17.3 CULTURAL CVARS

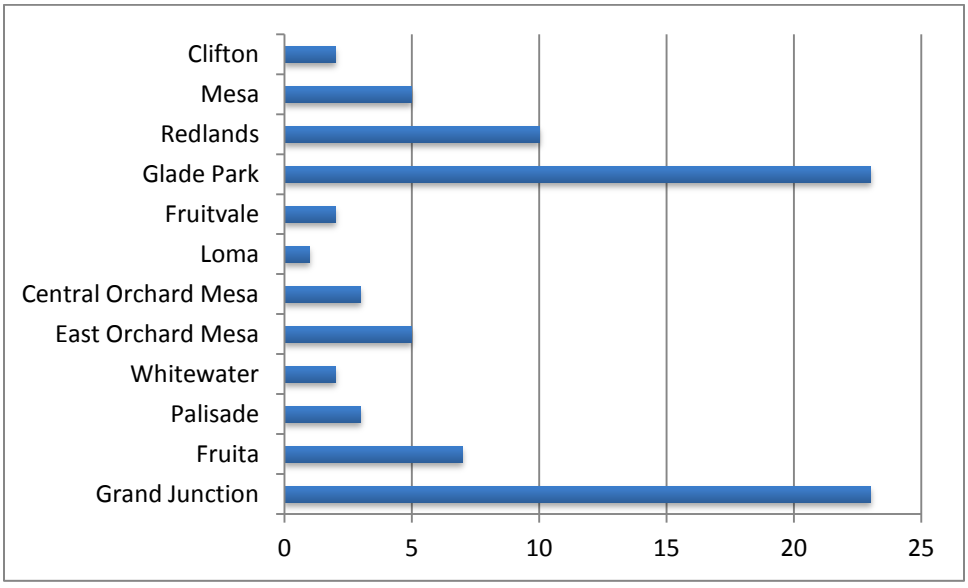
Many historical landmarks are scattered throughout the County. Particular CVARs that have been identified by the Core Team and the public are:

- All existing archaeological sites
- Old homesteads
- Old schoolhouses
- Historic buildings

4.18 PUBLIC OUTREACH

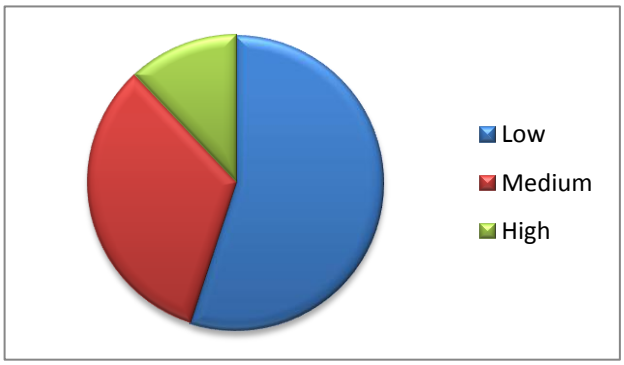
The following is a summary of the results of the community survey. Eighty-eight residents responded to the survey, providing the following information.

1) Respondents represented the following communities:

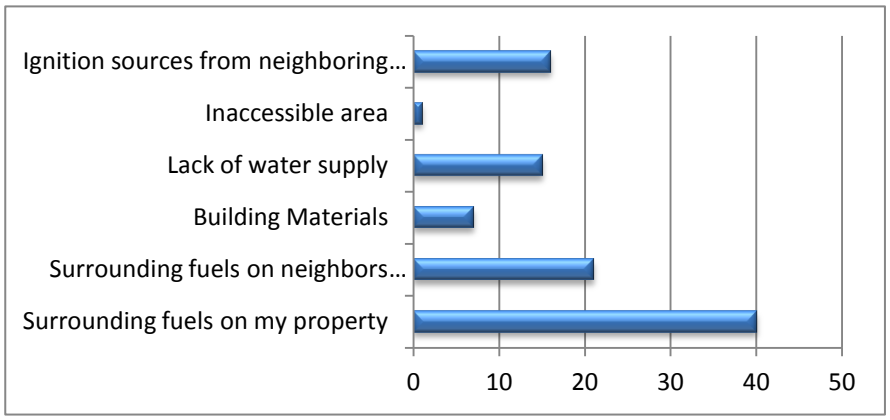


The survey asked the following questions; charts display the percentage of the total responses.

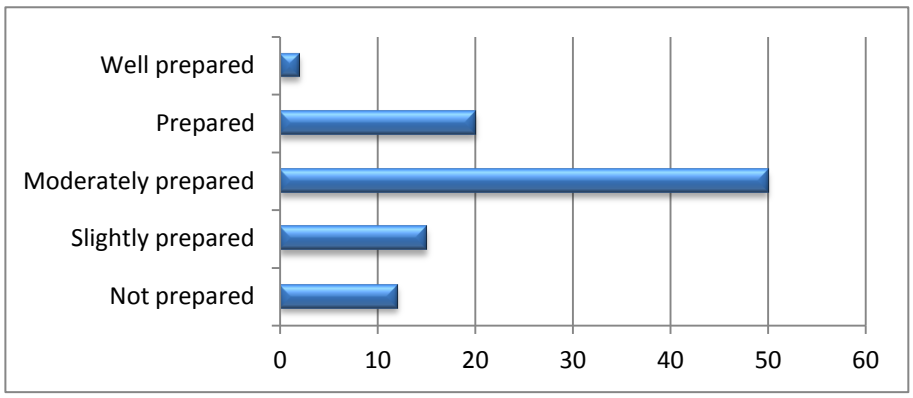
2) How would you rate your house in terms of risk from wildfire?



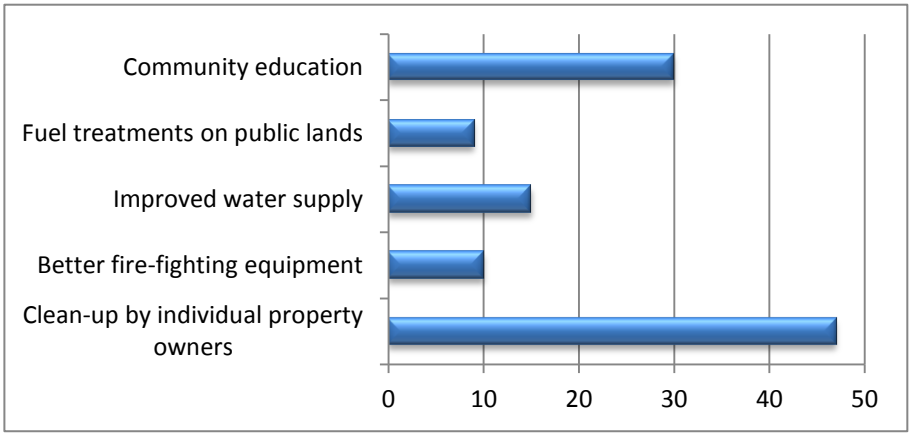
3) My home is vulnerable to wildfire because of….?



4) How prepared is your community for a large wildfire?

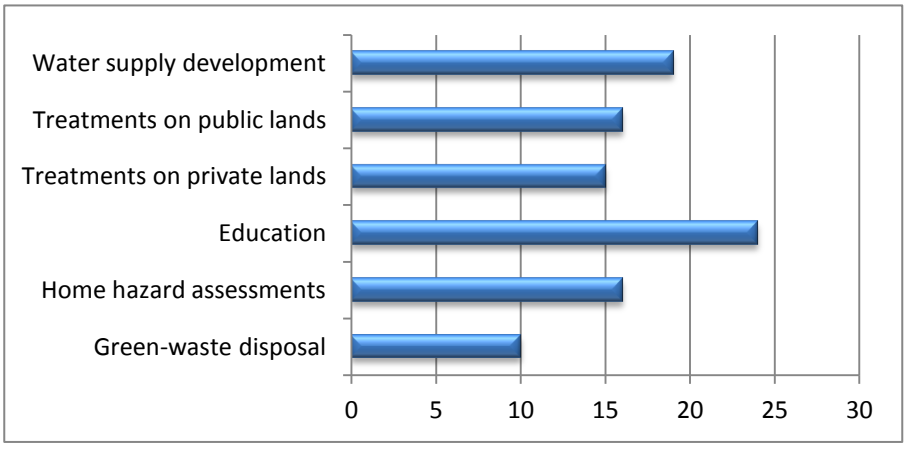


5) The action most important to making my community prepared for wildfire is……?



6) My biggest challenge to making my home fire safe is….?

7) I would be most interested in funding to help me and my community with….?



Below is a summary of community comments from the outreach efforts. A more complete list is provided in Appendix C.

- Most people wanted to see protection of homes, natural areas, and wildlife.
- People valued cultural sites and historic buildings.
- People wanted to protect hiking and biking trails.
- People wanted to protect municipal infrastructure and public facilities such as schools.
- People were concerned about a lack of water supply and low pressure in existing hydrant systems. Specific subdivisions were named, e.g., Redlands Village Subdivision.
- People were concerned about the fire risk along the river corridor, particularly where homes interface with public lands (for example, the Walker Wildlife Refuge).
- People are concerned about strained firefighting resources.
- People would like information about fuels treatment on their lands and on adjacent public lands.

These results (from 88 respondents) suggest that although people only perceive their homes to be at low to moderate risk from wildfire they are still interested in mitigating fire hazards to their communities through a variety of means. Most people felt that lack of reliable water supply and excessive fuels on their properties and neighboring properties were putting their homes at risk. Few people felt that their community was well prepared for wildfire, and to be better prepared they suggest clean-up by individual property owners and community education are most important. Treatments on public land were rated as lowest importance by those surveyed. Many people think their homes are safe, many of those who wanted to improve their home safety felt that money was their greatest barrier to doing so. Most people would be interested in funding to provide more education regarding fire prevention as well as better water supplies, treatments on public and private lands, and home hazard assessments. The general findings from these surveys are that community education is needed in the County so that homeowners are better informed with regards to protecting life and property. The results of the public outreach help to drive the priorities for treatment and are used to formulate recommendations and action items.

5.0 RECOMMENDATIONS AND ACTION ITEMS

This chapter addresses four different types of recommendations: 1) fuels reduction projects, 2) public education and outreach, 3) actions homeowners and communities can take to reduce structural ignitability, and 4) actions to improve firefighting capability. These recommendations are based on Core Team input, public outreach, the Composite Risk/Hazard Assessment, and the Community Risk/Hazard Assessment. The recommendations are general in nature to provide maximum flexibility in implementation. Potential funding opportunities that may be used for implementation of the recommendations are found in Appendix F.

5.1 RECOMMENDATIONS FOR FUELS REDUCTION PROJECTS

The purpose of any fuels reduction treatment is to protect life and property by reducing the potential for catastrophic wildfire, as well as to restore landscapes to a sustainable and healthy condition. Moderating extreme fire behavior, reducing structural ignitability, creating defensible space, providing safe evacuation routes, and maintaining all roads for firefighting access are methods of fuels reduction likely to be used around communities located in a WUI zone. Use of multiple treatment methods often magnifies the benefits.

Fuels should be modified with a strategic approach across the project area to reduce the threat that high-intensity wildfires pose to lives, property, and other values. Pursuant to these objectives, recommendations have been developed in the context of existing and planned fuels management projects. These recommendations initially focus adjacent to structures (defensible space), then near community boundaries (fuel breaks, cleanup of adjacent open spaces), and finally in the wildlands beyond community boundaries (larger scale forest health and restoration treatments). A common focus of fuels treatment is to reduce brush, diseased trees, dead fuels, and immature trees in favor of healthy, more mature trees.

While not necessarily at odds with one another, the emphasis of each of these treatment types is different. Proximate to structures, the recommendations focus on reducing fire intensity consistent with Firewise and International Fire Code standards. Further into the wildlands, treatments will tend to emphasize the restoration of historic conditions and general forest health. Cooperators in fuels management should include federal, state, and local agencies as well as interested members of the public.

Table 5.1 summarizes the types of treatments recommended throughout the planning area. The majority of the treatments are focused on high or extreme risk areas, as defined by the Composite Risk/Hazard Assessment, Core Team collaboration, and public input. Many of these treatment recommendations are general across the communities because similar conditions and concerns were raised for all communities that border wildland areas. Specific action recommendations are highlighted in individual tables by fire district in Chapter 4. Table 5.1 addresses the requirement for an action plan and assessment strategy by providing monitoring guidelines and a timeline for implementation. This timeline is obviously dependent on available funding and resources, as well as National Environmental Policy Act (NEPA) protocols for treatments on public lands.

The treatment list is by no means exhaustive and should be considered purely a sample of required projects for the future management of the County. Many projects may be eligible for

grant funds available from federal and/or state sources. For a list of funding sources please refer to Appendix F.

Fire management cannot be a one-size-fits-all endeavor; this plan is designed to be flexible. Treatment approaches and methods will be site-specific and should be adapted to best meet the needs of the landowner and the resources available. Moreover each treatment recommendation should address protection of CVAR particularly the protection of threatened and endangered species. For treatments in or close to wetland and riparian areas the practitioner should consult the Colorado Natural Heritage Program Survey of Critical Wetlands and Riparian Areas in Mesa County (Rocchio et al. 2003) to determine that treatments would not impact designated sensitive areas. It is the intent of this plan to be an evolving document that will incorporate additional areas of the County as they change in risk category over time.

Table 5.1. Fuels Reduction Treatment Recommendations

Project	Location and Landownership/ Management	Method	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Monitoring	Contact
Defensible space cost-sharing programs	All private land within MCCWPP planning area would be eligible; priority areas: Glade Park, Redlands, all Plateau Valley communities, Kannah Creek, Purdy Mesa, Upper Reeder Mesa, Unaweep Canyon	Selective thinning; pruning (to about 25% of tree/shrub height); chip and/or remove debris; provide adequate defensible space. Follow CSFS defensible space guidelines.	Protect life and property by reducing spread of fire from wildland fuels to urban structures. Also improve vehicle access, increase tree health/vigor, and give firefighters a margin of safety.	Spring 2013 High	Conduct on-site inspections with owners; consider photo documentation of pre- and post-treatment; apply adaptive management from best available information; determine if Firewise Communities techniques are being applied.	CSFS Landowner Assistance Program. Contact: Kelly Rogers (District Forester) CSFS_GrandJunction@mail.colostate.edu (970) 248-7325 For funding sources refer to Appendix F.
Defensible space assessments	All private land within MCCWPP planning area would be eligible	Firewise Communities-based assessments of individual homes. The professional assessment would help identify the most critical actions that an individual could take. Assessments could also include marking trees and shrubs suggested for removal.	Reduce risk of home ignitions. Empower homeowners to take the most effective actions. Allow funding to address a larger number of homes.	Fall 2013 High	Conduct on-site inspections with owners; identify and mark trees or shrubs for removal within the 100-foot safety zone.	CSFS Landowner Assistance Program. Contact: Kelly Rogers (District Forester) CSFS_GrandJunction@mail.colostate.edu (970) 248-7325 For funding sources refer to Appendix F.
Remove abandoned structures and clean up yard debris	Private All communities	Conduct mechanical thinning and manual clearing. Develop program of enforcement for the County to clean up derelict or abandoned lots.	Protect life and property by preventing spread of fire from wildland to structural fuels. Improve firefighter safety by providing clear access to structures in the WUI.	By Fall 2013 High	Develop a community task force to carry out assessments of properties.	County to enforce

Project	Location and Landownership/ Management	Method	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Monitoring	Contact
Saltcedar and Russian olive reduction	Private and public All riparian areas throughout the County; priority areas: Colorado and Gunnison river corridors, Colorado River State Park areas, Redlands, Orchard Mesa, Fruita, Palisade	Removal of saltcedar by cut and stump treatment or entire root extraction. Thin-from-below treatments in cottonwood to raise crown base height to >8 feet. This helps to reduce potential crown fire in cottonwood. Slash removal and disposal. Selective removal of other non-natives from riparian ecosystem. Follow-up revegetation treatments. See Section 5.3.5 for more detailed description of methods.	Help mitigate extreme fire behavior in timber fuels and reduce potential spread to communities adjoining the river. Build collaboration by working with variety of agencies, non-profits and local watershed groups.	Spring 2014 High	Monitor effects on wildlife populations, soils, understory vegetation, invasive species, and water yield. Potential for community monitoring programs that include schools and youth groups. Refer to Chapter 6, Levels 1–4.	Use partnership between Tamarisk Coalition and City of Grand Junction and Fruita as template. Contact: Tamarisk Coalition – Stacey Kolegas skolegas@tamariskcoalition.org (970) 256-7400 Also trained youth corps: Western Colorado Conservation Corp – J. Roberts jroberts@mesapartners.org (970) 241-1027 For funding sources refer to Appendix F.
Create fuel breaks on the south/ southwest edge of communities, in cooperation with neighboring public lands	All private land within MCCWPP planning area would be eligible; priority areas: Glade Park, Redlands, all Plateau Valley communities, Kannah Creek, Purdy Mesa, Upper Reeder Mesa, Unaweep Canyon	Strategic placement of treatments on public and private land will improve effectiveness. Fuel break prescriptions should be site-specific, depending on fuel type, topography, soils, and adjacent land management practices. Examples include mowing and blading strips along fence lines or shaded fuel breaks.	Help mitigate extreme fire behavior and provide an area from which firefighters can safely suppress a fire.	Spring 2013 High	Regular maintenance needed to ensure access is clear of vegetation or obstructions. Monitoring should occur prior to fire season (February) and in the fall (October).	UCR, CSFS, Mesa County, County Fire Warden. For funding sources refer to Appendix F.

Project	Location and Landownership/ Management	Method	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Monitoring	Contact
Protect power lines and communication lines	Utility company right-of-ways	Maintain clearance under power lines and around posts.	Prevent destruction of energy or communications infrastructure in event of fire.	Fall 2013 High	Regular maintenance needed to ensure lines are clear of vegetation.	Utility companies.
Mow and remove invasive species along railroad right-of-way	Railroad, BLM, County Railroad throughout extent of County; priority areas: between Palisade and De Beque to address heavy fire occurrence along railroad	Mow a 70-foot buffer along edge of railroad. Regularly remove invasive species and shrub encroachment.	Protect ranchland and communities from potential ignition from railroad.	Spring 2013 High	Regular maintenance needed to ensure clearance of vegetation and reduced fuels density. Monitoring should occur prior to fire season (February) and in the fall (October).	Union Pacific Railroad, BLM.
Regular mowing along major highway right-of-way	Public County, state, and federal highways	Extend mowing width. Mow to fence line.	Protect life and property from fire spread from potential ignition source; protect evacuation routes in event of wildfire.	Fall 2013 High	Regular maintenance needed to ensure clearance of vegetation and reduced fuels density Monitoring should occur prior to fire season (February) and in the fall (October).	Colorado Department of Transportation. Mesa County Public Works. Explore option of using prison crews to carry out mowing and maintenance of right-of-way.
Fire effects monitoring	Private and public Entire MCCWPP planning area	Carry out fuels monitoring and fire effects monitoring following wildfire and/or prescribed fire in grassland, shrubland, and riparian areas.	Improve understanding of the effectiveness of fuels treatments on fire behavior and provide an inventory of fuels loading to direct treatment.	Ongoing Moderate	Monitoring should be carried out for multiple (>3) years post-burn (both prescribed fire and wildfire) to assess vegetation response, wildlife response, soils, and hydrology. Refer to Chapter 6, Levels 1–4.	BLM, USFS, NPS, Western Colorado Conservation Corp, Student Conservation Association Volunteers, local high schools.

Project	Location and Landownership/ Management	Method	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Monitoring	Contact
Create local fuels reduction task force/WUI working group	Private and public Landscape scale	Formulate a task force of local practitioners who could develop best management practices for fuels treatment in grass, shrublands, timber and riparian fuels, particularly in the WUI. Create demonstration sites and workshops to inform landowners. Utilize local spark plugs and/or choose demonstration site in visible location to attract local attention.	Protect community and infrastructure by empowering local landowners to create mechanism to protect their own properties.	Ongoing Moderate	Monitor effects of treatments on species dynamics and species composition, particularly invasion of exotic species. Monitor regrowth and erosion, and maintain clearance. Refer to Chapter 6, Levels 1–4. Monitoring and maintenance should occur prior to fire season (February) and in the fall (October).	Collaboration of land managers in County to improve fire planning. Work from the grass-roots level up-VFDs, conservation and watershed groups. For funding sources refer to Appendix F.
Preplanned fire breaks	Private and public Areas of stable soils	Identify areas on public and private lands that would be appropriate for fire breaks. Select areas where soils are less erodible since all vegetation will be removed. On implementation, landowner or agency should chisel the land to retain root structure and prevent soil erosion.	Protect life and property in the event of a wildfire by having a preplanned area that could withstand fire break construction.	Ongoing Moderate	Would be a one-time-only treatment in response to wildfire.	Collaboration of land managers in County to improve fire planning. Could be an activity of the WUI Working Group.

Project	Location and Landownership/ Management	Method	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Monitoring	Contact
Continuing landscape level fuel treatments in cooperation with public lands managers. (Figure 5.1–Figure 5.7)	Private and Public lands adjacent to and beyond WUI areas.	Mechanical, prescribed fire, chemical.	Create landscape level treatments that will mitigate fire behavior before fires impinge on WUI areas.	High Ongoing fuels planning	Ongoing, following agencies protocols.	UCR, CSFS, County. For funding sources refer to Appendix F.
Continue implementing fuels treatment projects outlined in the 2008 EA-Grand Junction City Watershed Vegetation Management Projects (USFS 2008) (Section 5.3.5 and Figure 5.5)	Private and public lands in the Grand Junction City watershed. Shown on Figure 5.4 as burn blocks and mechanical treatment units. (Note: Some proposed treatments from the 2008 EA shown in Figure 5.4 are impeded by access issues and are unlikely to be implemented at this time)	Mechanical, prescribed fire, combination.	Protect the Grand Junction City watershed from resource damage and thereby protect municipal water supplies.	High Ongoing fuels planning	Ongoing, following agencies protocols.	UCR, CSFS, City of Grand Junction Utility and Street Systems, Mesa County. For funding sources refer to Appendix F.
Implement fuel treatments to mitigate fire hazard in the Palisade Watershed as outlined in the 2009 Fire Mitigation Plan (Section 5.3.5, Figure 5.2)	Town of Palisade, public lands	Mechanical, prescribed fire, combination.	Protect the Palisade watershed from resource damage and thereby protect municipal water supplies.	High Ongoing fuels planning	Ongoing, following agencies protocols.	UCR, CSFS, Town of Palisade, Mesa County. For funding sources refer to Appendix F.

Project	Location and Landownership/ Management	Method	Serves To	Timelines for Implementation and Priority (High, Medium, Low)	Monitoring	Contact
Oil and Gas Infrastructure protection	All jurisdictions and districts	Mechanical thinning treatments and mowing.	Protect the public, fire fighters and industry workers from fire relating to oil and gas infrastructure.	High Ongoing	Regular maintenance needed to ensure clearance of vegetation and reduced fuel density. Monitoring should occur prior to fire season (February) and in the fall (October).	Oil and gas industry representatives.

Figure 5.1 through Figure 5.7 illustrate past, present and future fuels treatments on private and public lands in the County. Note: areas denoted in pink are potential public land fuel treatments. These areas are conceptual and have not been field verified for viability and would have to undergo the NEPA process. The best type of fuels treatment for each area would be determined during this process, which incorporates thorough public scoping. It is also possible during the NEPA process that the treatment areas may change or be altered due to the multiple use mission of the BLM to consider all natural and cultural resources.

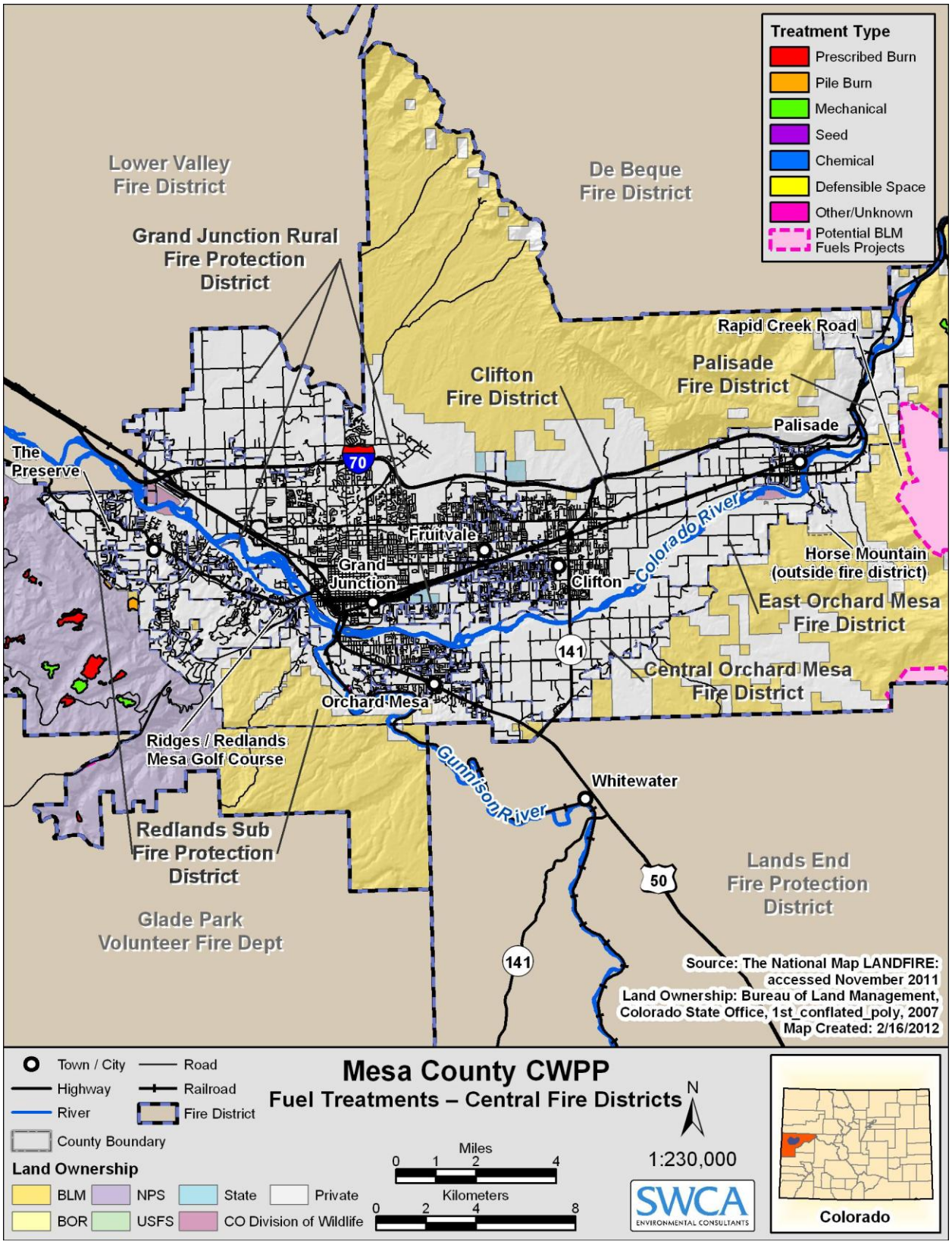


Figure 5.1. Existing and proposed fuel treatments in the Central Fire Districts.

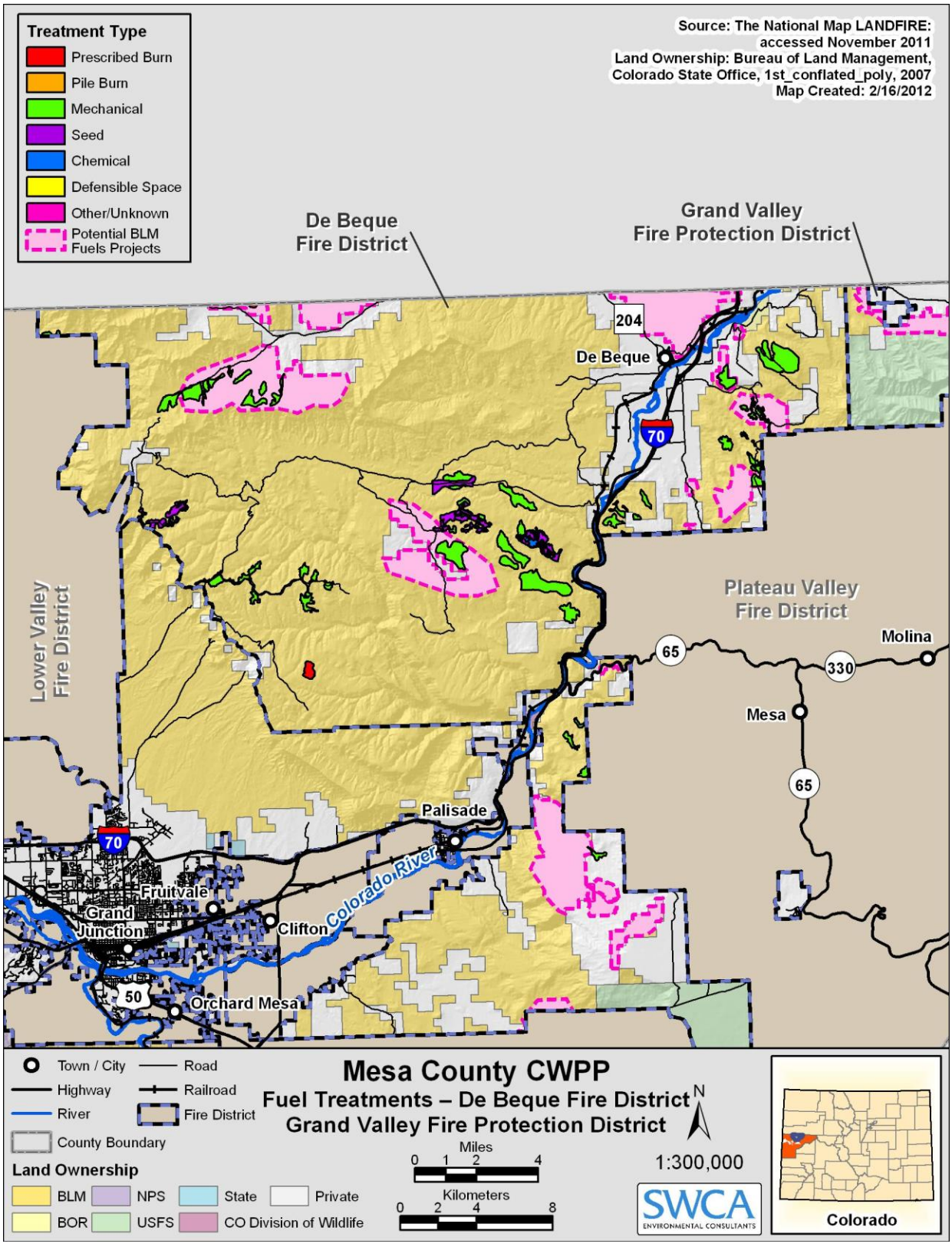


Figure 5.2. Existing and proposed fuel treatments in De Beque Fire District and Grand Valley Fire Protection District (pink areas southeast of Palisade represent treatments in the Palisade watershed.

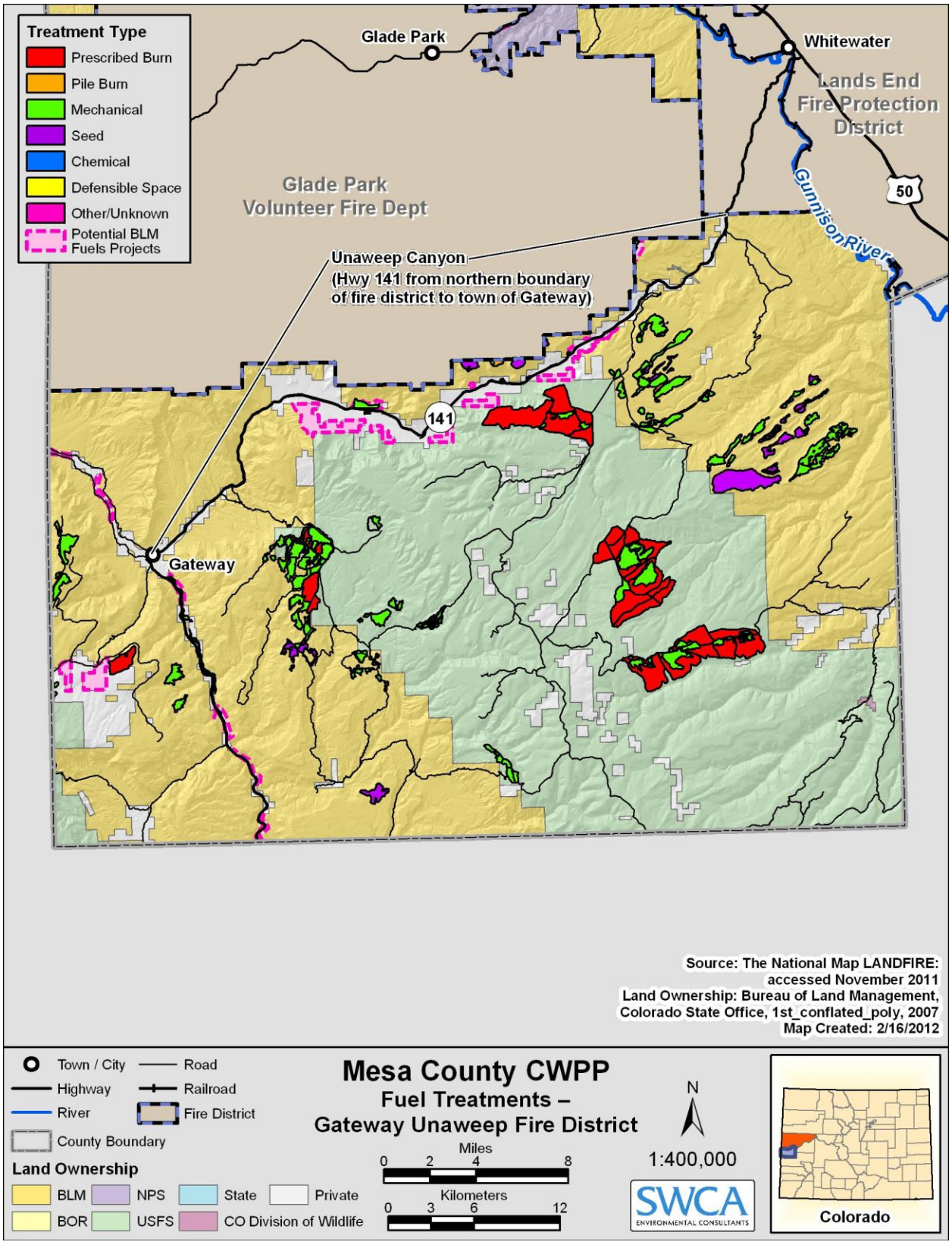


Figure 5.3. Existing and proposed fuel treatments in Gateway Unaweep Fire District.

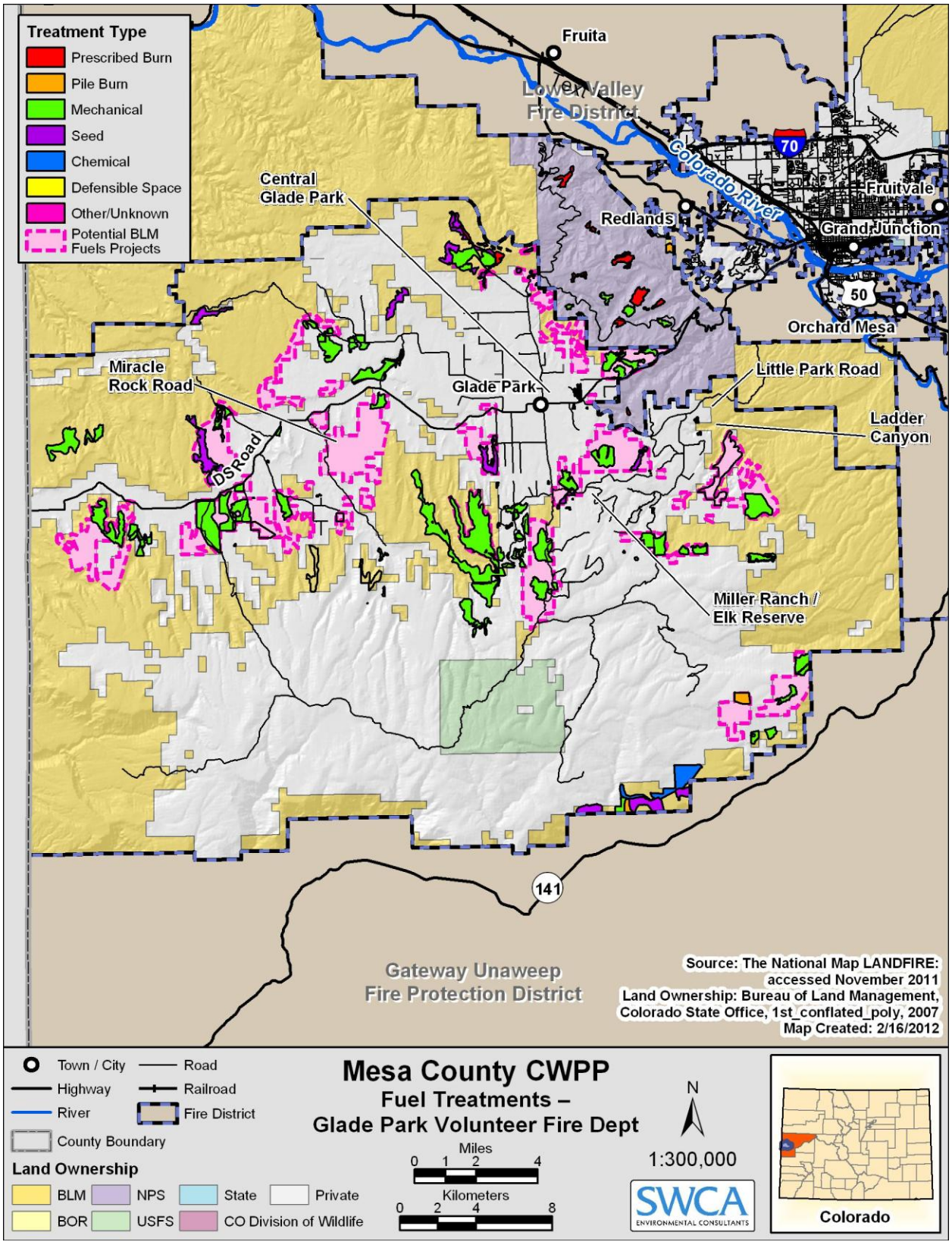


Figure 5.4. Existing and proposed fuel treatments in the Glade Park Volunteer Fire Department.

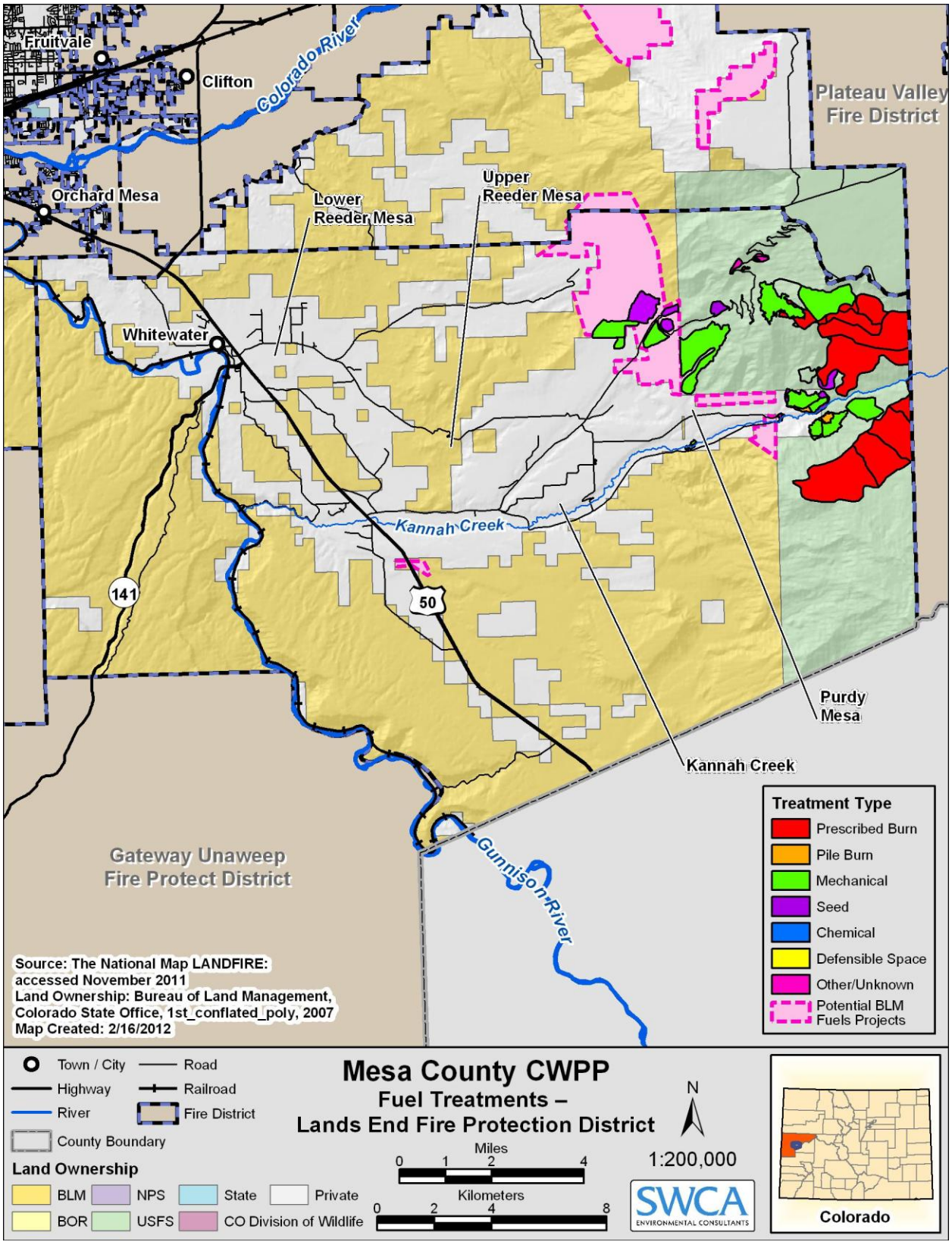


Figure 5.5. Existing and proposed fuel treatments in the Lands End Fire Protection District.

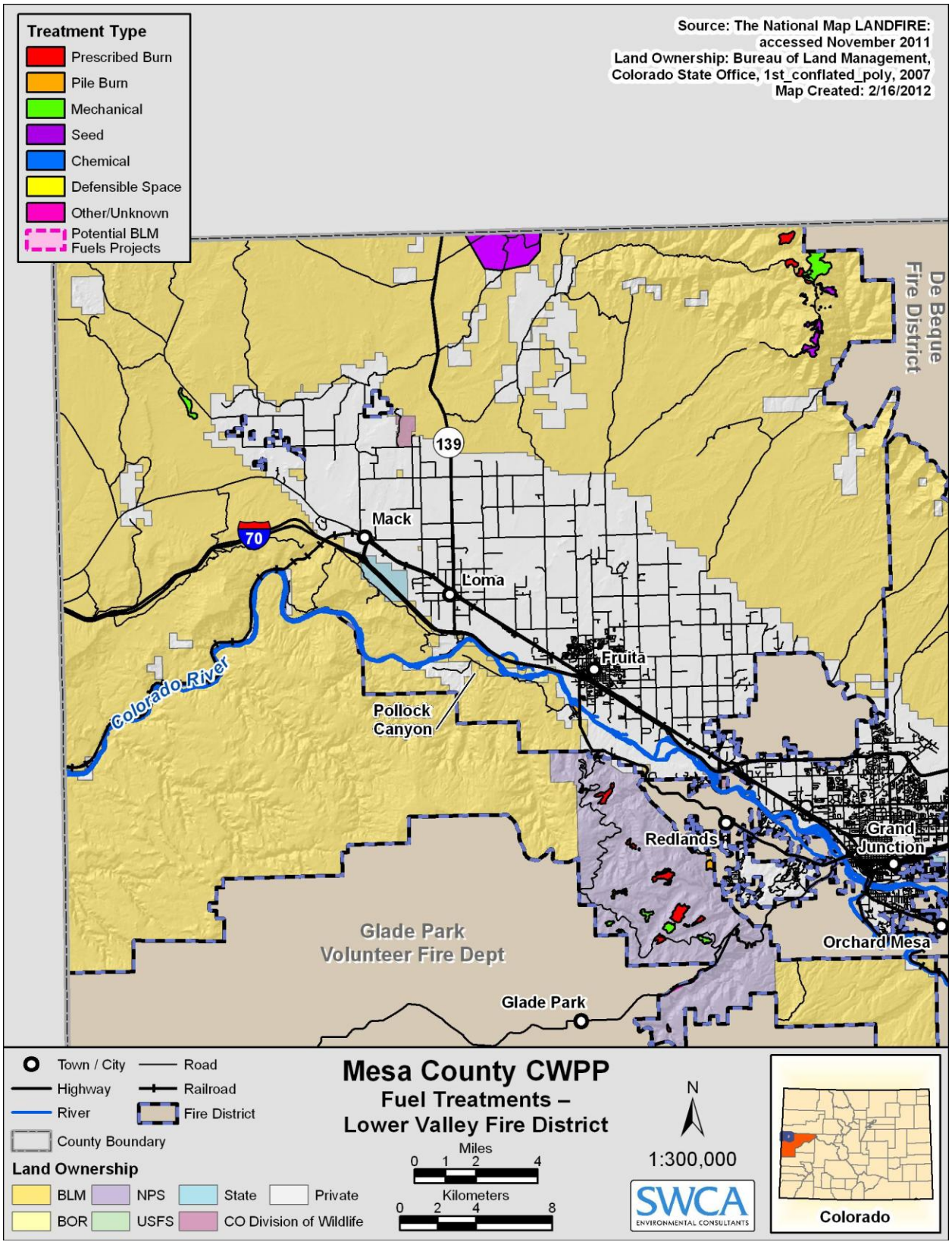


Figure 5.6. Existing and proposed fuel treatments in the Lower Valley Fire District.

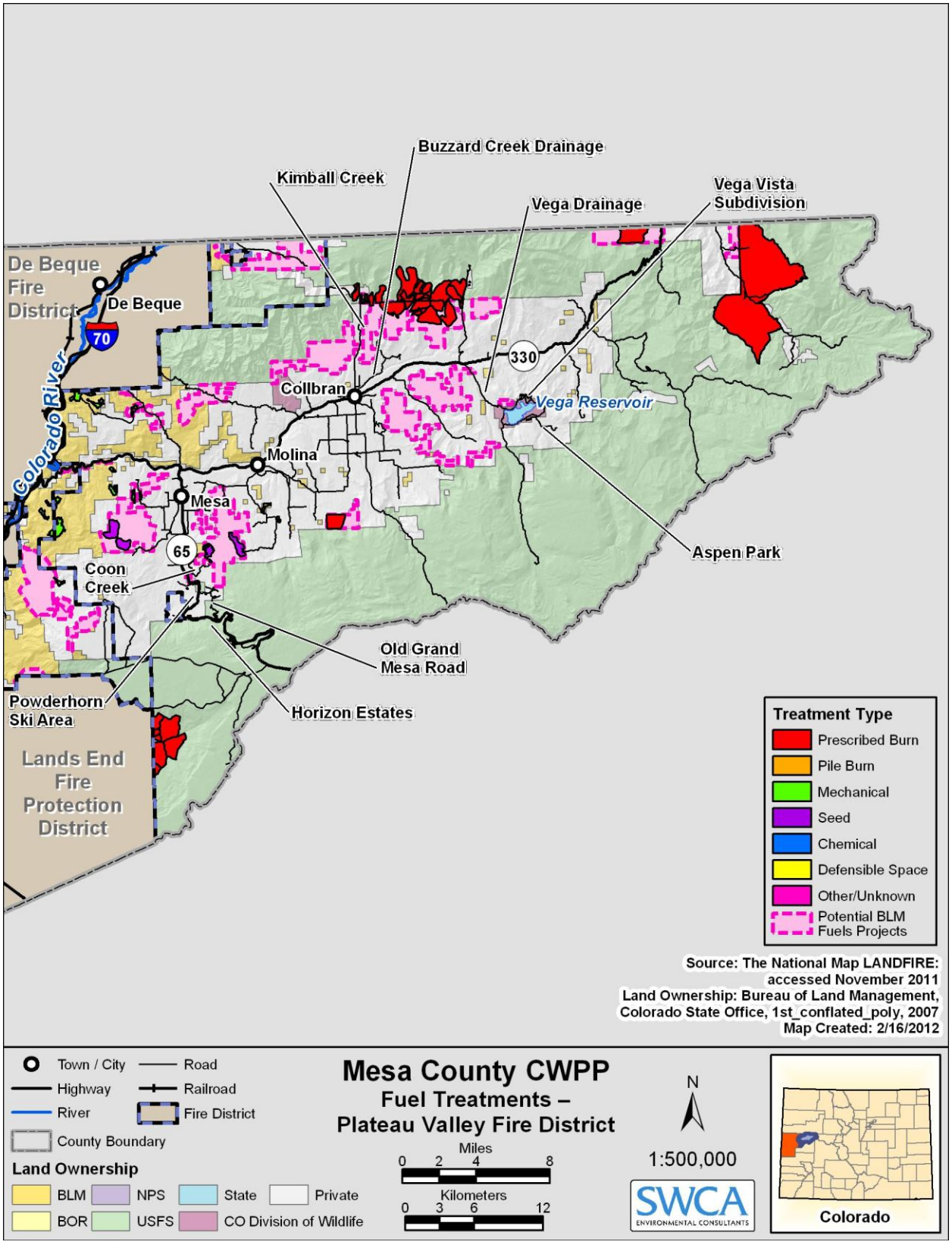


Figure 5.7. Existing and proposed fuel treatments in the Plateau Valley Fire Protection District.

5.2 FUELS TREATMENT SCALES

5.2.1 DEFENSIBLE SPACE

Defensible space is perhaps the fastest, most cost effective, and most efficacious means of reducing the risk of loss of life and property. Although fire agencies can be valuable in providing guidance and assistance, creating defensible space is the responsibility of the individual homeowner.

The CSFS provides defensible space recommendations in its article "Creating Defensible Space Zones" (Dennis 2006). Effective defensible space consists of an essentially fuel-free zone adjacent to the home, a treated secondary zone that is thinned and cleaned of surface fuels, and (if the parcel is large enough) a transitional third zone that is basically a managed forest area. These components work together in a proven and predictable manner. Zone 1 keeps fire from burning directly to the home; Zone 2 reduces the adjacent fire intensity and the likelihood of torching, crown fire, and ember production; and Zone 3 does the same at a broader scale, keeping the fire intensity lower by maintaining a more natural, historic condition (Figure 5.8).

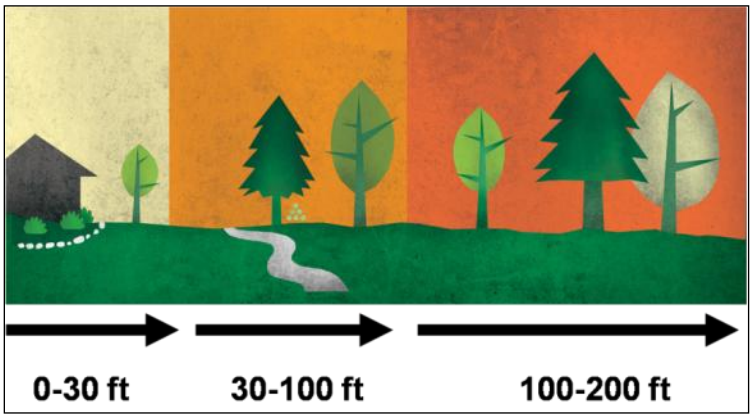


Figure 5.8. Defensible space zones.

Source: www.firewise.org

It should be emphasized that defensible space is just that—an area that allows firefighters to work effectively and with some degree of safety to defend structures. While defensible space may increase a home's chance of surviving a fire on its own, a structure's survival is not guaranteed, with or without firefighter protection. Nevertheless, when these principles are consistently applied across a neighborhood, everybody benefits.

Specific recommendations should be based on the particular hazards adjacent to a structure such as slope steepness and fuel type. Local fire authorities or a state forester should be contacted if a professional assessment seems warranted. Firewise guidelines and the Homeowners Guide (Appendix G) are an excellent resource, but creating defensible space does not have to be an overwhelming process. Assisting neighbors may be essential in many cases. Homeowners should consider assisting the elderly, sharing ladders for gutter cleaning, and assisting neighbors with

large thinning needs. Adopting a phased approach can make the process more manageable and encourage maintenance (Table 5.2).

Table 5.2. Example of a Phased Approach to Mitigating Home Ignitability

Year	Project	Actions
1	Basic yard cleanup (annual)	Dispose of clutter in the yard and under porches. Remove dead branches from yard. Mow and rake. Clean off roofs and gutters. Remove combustible vegetation near structures. Coordinate disposal as a neighborhood or community. Post 4-inch reflective address numbers visible from road.
2	Understory thinning near structures	Repeat basic yard cleanup. Limb trees up to 6–10 feet. Trim branches back 15 feet from chimneys. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
3	Understory thinning on private property along roads and drainages	Limb trees up to 6–10 feet. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
4	Overstory treatments on private property	Evaluate the need to thin mature or diseased trees. Prioritize and coordinate tree removal within neighborhoods to increase cost effectiveness.
5	Restart defensible space treatment cycle	Continue the annual basic yard cleanup. Evaluate need to revisit past efforts or catch those that were bypassed.

5.2.2 Fuel Breaks and Open Space Cleanup

The next location priority for fuels treatments should be where the community meets the wildland. This may be the outer margins of a town or an area adjacent to occluded open spaces such as a park or river corridor. Shaded fuel breaks may be created to provide options for suppression resources, opportunities to introduce prescribed fire, or to create a zone where crown fire will be forced to the ground where it is more easily contained. In many cases, shaded fuel breaks may be created by thinning along roads. This provides access for mitigation resources and firefighters as well as enhancing the safety of evacuation routes.

Some areas adjacent to communities require fuel reduction to mitigate a hazardous condition, although are not suitable for fuel breaks. The most prevalent example of this in the County is the river corridor that runs through many communities.

5.2.3 Larger-scale Treatments

Farther away from WUI communities, the emphasis of treatments often becomes broader. While reducing the buildup of hazardous fuels remains important, other objectives are often included, such as restoration of historic conditions and forest health. Wildfires frequently burn across jurisdictional boundaries, sometimes on landscape scales. As such, these larger treatments need to be coordinated on a strategic level. This requires coordination between projects and jurisdictions, as is currently occurring. Federal land managers have carried out numerous fuels reduction projects across the County and have ongoing projects planned on public lands that are

designed to reduce hazardous fuels to protect communities and resources (see Figure 5.1–Figure 5.7).

5.3 FUEL TREATMENT METHODS

Since specifics of the treatments are not provided in detail in Table 5.1, different fuels reduction methods are outlined in the following narrative.

Several treatment methods are commonly used, including manual treatments, mechanized treatments, and prescribed fire (Table 5.3). This brief synopsis of treatment options and cost estimates is provided for general knowledge; specific projects will require further planning. Cost estimates for treatments range from $300 to $1,200 but should be considered as very general guidelines. The appropriate treatment method and cost will vary depending on factors such as the following:

- Diameter of materials
- Proximity to structures
- Acreage of project
- Fuel costs
- Steepness of slope
- Area accessibility
- Density of fuels
- Project objectives

It is imperative that long-term monitoring and maintenance of all treatments is implemented. Post-treatment rehabilitation such as seeding with native plants and erosion control may be necessary.

Table 5.3. Summary of Fuels Treatment Methods

Treatment	Estimated Cost	Comments
Machine mowing	$90–$200 per acre	Appropriate for large, flat, grassy areas on relatively flat terrain.
Prescribed fire	$100–$125 per acre	Can be very cost effective. Ecologically beneficial. Can be used as training opportunities for firefighters. May require manual or mechanical pretreatment. Carries risk of escape, which may be unacceptable in some WUI areas. Unreliable scheduling due to weather and smoke management constraints.
Brush mastication	$300–$500 per acre	Brush species (Gamble oak in particular) tend to resprout vigorously after mechanical treatment. Follow-up treatment with herbicides, fire, grazing, or further mechanical treatments are typically necessary. Mastication tends to be less expensive than manual (chainsaw) treatment and eliminates disposal issues.
Timber mastication	$300–$1,200 per acre	Materials up to 10 inches in diameter and slopes up to 30% can be treated. Eliminates disposal issues. Environmental impact of residue being left on site is still being studied.
Manual treatment with chipping or pile burning	$300–$1,200 per acre	Allows for removal of merchantable materials or firewood in timber. Requires chipping, hauling, pile burning of slash in cases where lop and scatter is inappropriate. Pile burning must comply with smoke management policy.
Feller buncher	$750 and up per acre	Mechanical treatment on slopes more than 30% or of materials more than 10 inches in diameter may require a feller-buncher rather than a masticator. Costs tend to be considerably higher than masticator. May allow for removal of merchantable material.

5.3.1 Manual Treatment

Manual treatment refers to crew-implemented cutting with chainsaws. Although it can be more expensive than mechanized treatment, crews can access many areas that are too steep or otherwise inaccessible with machines. Treatments can often be implemented with more precision than prescribed fire or mechanized methods allow. Merchantable materials and firewood can be removed while non-merchantable materials are often lopped and scattered, chipped, or piled and burned on site. Care should be exercised to not increase the fire hazard by failing to remove or treat discarded material in a site-appropriate manner.

Strategic timing and placement of fuels treatments is critical for effective fuels management practices and should be prescribed based on the conditions of each particular treatment area. Some examples of this would be to place fuel breaks in areas where the fuels are heavier and in the path of prevailing winds and to mow grasses just before they cure and become flammable. Also, burning during the hotter end of the prescription is important since hotter fires are typically more effective at reducing heavy fuels and shrub growth. In areas where the vegetation is sparse and not continuous, fuels treatments may not be necessary to create a defensible area where firefighters can work. In this situation, where the amount of fuel to carry a fire is minimal, it is best to leave the site in its current condition to avoid the introduction of more flammable, exotic species such as cheatgrass.

5.3.2 Mechanized Treatments

Mechanized treatments include mowing, mastication, and whole tree felling. These treatments allow for more precision than prescribed fire, and are often more cost-effective than manual treatment.

Mowing, including all-terrain vehicle (ATV) and tractor-pulled mower decks can effectively reduce grass fuels adjacent to structures. For heavier fuels, a number of different masticating machines can be used, including drum- or blade-type masticating heads mounted on machines and ranging in size from a small skid-steer to large front-end loaders. Some masticators are capable of grinding standing timber up to 10 inches in diameter. Other masticators are more effective for use in brush or surface fuels. Mowing and mastication do not actually reduce the amount of on-site biomass, but alter the fuel arrangement to a less combustible profile.

Mowing of fuel breaks and around perimeters should take place at least once every growing season depending on the regrowth of vegetation over the course of the fire season. It is acknowledged that this may not be viable for all producers, in which case focus should be placed on areas that would pose greatest risk to life and property (e.g., the southwest edges of communities). Areas with cheatgrass or weeping lovegrass (*Eragrostis curvula*) should be mowed in the early spring and later in the season, depending on the amount of regeneration that takes place throughout the course of the season. Although mowing will not permanently remove stands of exotics, limiting the production of seedheads will help control their density and spread over time.

In areas of encroaching shrubs or trees, more intensive fuels treatments may be necessary to keep the fire on the ground surface and reduce flame lengths. Within the fuel break, shrubs should be removed, and trees should be pruned to a height of 4 to 8 feet, depending on the height of the fuel below the canopy, and thinned with a spacing of at least two to three times the height of the trees to avoid movement of an active fire into the canopy.

Mechanical shears mounted on feller bunchers are used for whole tree removal. The stems are typically hauled offsite for utilization while the limbs are discarded. The discarded material may be masticated, chipped, or burned in order to reduce the wildfire hazard and to speed the recycling of nutrients.

5.3.3 Prescribed Burning

Prescribed burning is also a useful tool to reduce the threat of extreme fire behavior by removing excessive standing plant material, litter, and woody debris while limiting the encroachment of shrubby vegetation such as broom snakeweed (*Gutierrezia sarothrae*), piñon pine, juniper, and other woody species into the grasslands. Similar to mowing, prescribed fires should be conducted along roads surrounding the WUI and around the particular areas at risk. On private lands the use of prescribed fire is likely to be limited due to concerns for fodder production and risk of escape. Where possible, prescribed fire could occur on public lands since fire is ecologically beneficial to the grassland community and wildlife habitat. Some areas, particularly along roadsides, may be susceptible to the invasion of exotic species, so this practice should be carried out with management of invasive species in mind.

Using prescribed burns can initiate regeneration of grasslands and rangelands, as fire facilitates natural ecosystem dynamics, such as nutrient and water cycling, which increase variability in vegetation composition and density. Grasslands across the west are threatened by woody encroachment, which shades out desirable plant species and uses large amounts of water. Grasslands have adapted to fire, and fire can be used periodically to remove unwanted trees. Fires provide restoration of productivity and diversity of grasslands, while controlling non-native or undesirable plant species and woody invasions.

Following any type of fuels reduction treatment, post-treatment monitoring should continue to ensure that management actions continue to be effective throughout the fire season. Vegetation in a grassland community can change rapidly in response to drought or moisture from year to year and during the course of the season, so fuels treatments should be adjusted accordingly.

5.3.4 Thinning and Prescribed Fire Combined

Combining thinning and prescribed fire can be the most effective treatment (Graham et al. 2004). In forests where fire exclusion or disease has created a buildup of hazardous fuels, prescribed fire cannot be safely applied and pre-burn thinning is required. The subsequent use of fire can further reduce residual fuels and reintroduce this ecologically imperative process.

5.3.5 Watershed-level Treatments

Grand Junction Watershed

In 2008, the USFS completed the Grand Junction City Watershed Vegetation Management Projects EA. This EA was done to examine the environmental impacts of a series of treatments within the Grand Junction's municipal watershed to restore pre-suppression ecosystem functions (including fire) and to modify, reduce, and remove a buildup of fuels (woody debris), as well as improve vegetative health; improve, repair and restore impacted non-motorized trails; and increase diversity of wildlife habitat. The area analyzed in this EA includes a total of 55,735 acres of National Forest System lands, public lands (BLM), City of Grand Junction lands, and other private lands. The watershed consists of 26,569 acres above the rim of the Grand Mesa and 29,166 acres lying below the rim. The EA analyzes the impacts of these treatments on the acres below the rim known as the Kannah Creek basin.

Specific land ownership breakdown by acres is as follows:

- City property: 2,780 acres
- Private property: 1,060 acres
- BLM: 2,560 acres
- USFS: 52,540 acres

The EA analyzes the impacts of these treatments on vegetation, fire and fuels, livestock grazing, recreation, roads and trails, oil and gas exploration, soils, cultural resources, and wildlife. This analysis compares two alternatives: the proposed action and no action.

The proposed action includes the following treatments:

1. Prescribe burn approximately 5,000 acres of Gambel oak, serviceberry (*Amelanchier* sp.), sagebrush, grass, and isolated areas of both pinyon-juniper and aspen over an eight- to 10-year rotation, beginning in 2008.
2. Mechanically treat approximately 3,000 acres by using a roller chopper, hydro-axe, or crews to thin, chop, or masticate dense stands of pinyon-juniper or oak.
3. Pre- or post-treat with appropriate tools such as herbicide treatments, seeding, etc.
4. Close unauthorized camp areas that currently present potential ignition sources within the basin area.
5. Re-introduce fire back into fire-adapted ecosystems where possible.
6. Construct, reconstruct, and/or reroute trails creating resource impacts within the watershed. Close, decommission, and/or rehabilitate those non-system routes deemed appropriate.

This analysis will not include those projects proposed on BLM lands within the watershed analysis boundary. These treatments would take place on approximately 8,000 acres of National Forest System lands, 240 acres of City of Grand Junction-owned land, and 600 acres of public lands administered by the BLM (see Figures 5.5 and 5.7).

The EA also analyzes the impacts of not implementing any of these treatments under the no action alternative.

The EA was released to the public in 2008 and was followed by a legal Notice of Decision, published in the *Grand Junction Daily Sentinel*.

Palisade Watershed

The Palisade Watershed Fire Mitigation Plan (2009) was prepared as a proactive measure to protect the water delivery infrastructure and water quality for Palisade. This plan addresses14,000 acres owned by the Town of Palisade within the watershed, and also includes some areas outside the Town of Palisade's jurisdiction that have the potential to impact the watershed infrastructure. The vegetation and fuels within the watershed addressed in the plan include pinyon-juniper, Gambel oak-mountain shrub, aspen, spruce/fir, and Douglas-fir/riparian. Certain fire mitigation challenges exist in each vegetation type. The pinyon-juniper community, which covers about 12% of the Town of Palisade's property, occurs on steep terrain in much of the watershed analysis area. This limits the practicality of prescribed burns. Mechanical fuel reduction is the most applicable fuel reduction method. In addition, some stands support a dense cheatgrass understory. Gambel oak-mountain shrub, which covers about 55% of the town property, is also most effectively treated mechanically. Aspen and spruce/fir comprise about 10% of the town property. Sudden aspen decline and subalpine fir bark beetles have resulted in high mortality in these areas, which creates a heavy build up of dead and downed fuels. Prescribed burning can be used in these areas. The Douglas-fir/riparian vegetation type is small in acres, but ecologically important along the perennial streams in the watershed. Douglas-fir bark beetles have caused increased tree mortality along Rapid and Cottonwood creeks. Prescribed burning could be used in these areas, following selective harvesting.

The plan establishes a 10-year strategy that includes six action items: 1) creation of defensible space around the metering gauges and homestead, 2) road maintenance, 3) Douglas-fir pheromone treatment, 4) herbicide application to control cheatgrass, 5) selective harvest (for

timber sale), and 6) prescribed burn. In the first two years, the plan is to clear fuels around the gauges, scrape and repair roads to improve access for firefighting resources, and apply the pheromone treatment within the Rapid Creek Douglas-fir stand. The outbreak of Douglas-fir bark beetles has resulted in increased tree mortality, which leads to increased fuel buildup. The use of pheromone treatment can slow or stop the spread of Douglas-fir beetles. Application of this hormone would need to be repeated to maintain the health of the stand. Bids for timber sales would also be solicited in the first two years of the plan. In years 2 through 4 of the plan, the timber sale would be implemented, prescribed burn plans would be prepared for all three units of the watershed (see below), and herbicide treatments would be conducted. In years 4 through 7, the prescribed burn plans would be implemented. In the final three years of the plan, road conditions would be maintained, prescribed burning completed, and herbicide applications repeated.

The prescribed burning outlined in the plan would occur in three units within the Palisade Watershed (see Figure 5.2). Unit 1 is 330 acres, which are mostly on Town of Palisade property (20 acres of BLM land). There are access roads on all sides of Unit 1. Unit 2 is 735 acres (80 acres of BLM land). It has roads on three sides and a fence line on the fourth. Unit 3 is on 428 acres of City of Grand Junction and BLM properties.

Additionally, two fire scenarios were modeled using the BehavePlus fire prediction system. Scenario 1 modeled an ignition in the lower portion of the watershed. Scenario 2 modeled an ignition mid-slope. Both scenarios showed that a fire would be difficult to control, but the first resulted in greater impacts to the watershed. Impacts may include increased sediment and debris flow, as well as invasion by cheatgrass.

5.3.6 Management of Non-native Plants

Like many ecosystems throughout Colorado, the County landscape is undergoing gradual degradation as a result of infestation by non-native species (Parker et al. 2005). These species have contributed to changing fire regimes in the County, heightening the risk of fire. A number of methods have been developed for removal of non-natives; the appropriate technique will depend on the infestation density, management objectives, environmental concerns, costs, and social considerations (Parker et al. 2005). The USDA maintains a list of noxious weeds rated from A to C based on the current degree of infestation of the species and the potential for eradication (USDA 2010).

Treatments for Saltcedar Infestation

Riparian areas throughout the County have in recent years become overrun by saltcedar. A vigorous program of removal is ongoing and showing success in many areas. Despite this, the eradication and control of saltcedar and long-term commitment are challenging, and multiple techniques are required to reduce its extent and minimize its spread. Techniques used for the management of saltcedar include mechanical, chemical, and biological methods. The current saltcedar removal programs should be used as a model for future treatments.

Mechanical Treatments, such as hand-pulling and cutting, can be used for smaller stands of young saltcedar saplings, but these treatments become expensive and ineffective within large stands of shrub-sized individuals (Parker et al. 2005). Hand cut and herbicide stump treatments

can cost as much as $5,000 per acre, but may be the most effective methods in more inaccessible areas or steep terrain.

Root cutting and bulldozing can be effective, but the benefits may not outweigh the problems resulting from soil damage and the expense of this method (approximately $10,000 to clear and mulch 20–50 acres).

Fire has been used with some success, but because saltcedar is fire adapted, the species readily resprouts.

Flooding can also be used to control saltcedar if root crowns remain submerged for at least three months.

Resprouting is likely to occur after using any of these methods, so it is highly recommended to combine methods and follow-up treatments to continue control of this species.

Chemical control, or the combination of cutting and/or chemical application to cut stumps or small-diameter whips, is one of the most common management techniques used for saltcedar and is typically the most effective method used; however, application of herbicides should be site-specific. Aerial applications of imazapyr or an imazapyr and glyphosphate mixture should occur from late August through September. This method is slow-acting, and treated trees should not be removed for up to three years after the treatment to ensure root kill. It is important to only use herbicides that are approved for application near water.

Biological control methods have also shown some success in the County, in public meetings the public noted a large number of beetle-killed saltcedar exists along the Colorado and Gunnison river corridors. These saltcedar died due to the introduction of the saltcedar leaf beetle (*Diorhabda elongata*), which asserts physiological stress on the tree through defoliation. The beetle is well established in the County and neighboring counties. This treatment, coupled with burning in the summer months under intense prescribed fire prescription, has been successful in some saltcedar stands. Significant damage to the root crown is required for high mortality; this may require supplementing fuel loading, particularly around the root crown.

The methods used will depend on the size of the saltcedar stand, the characteristics of the riparian area, and the distance to a community. Saltcedar eradication has been ongoing in the County on city, County, BLM, and USFS lands; the Tamarisk Coalition has been a partner in many of these efforts. Sharing experiences and working across agency boundaries should continue to aid in enhancing this ongoing effort.

Recommendations specific to treatment of saltcedar (and Russian olive) include (summarized from CDNR 2004):

- Use previous projects as templates for future treatments (e.g., Tamarisk Coalition in partnership with the City of Grand Junction and the Town of Fruita, Colorado National Monument treatments).
- Use the Tamarisk Coalition or other groups such as the Nature Conservancy to do presentations to community groups.

- Encourage volunteerism; people can join the Tamarisk Coalition for volunteer projects in the County.
- Engage private landowners who have saltcedar on their properties. CSU's Cooperative Extension Offices can provide landowner and volunteer training days at state parks, providing proper techniques for tamarisk control.
- Utilize the CSU Cooperative Extension Office for literature on saltcedar removal.
- Utilize the best scientific information from the biennial saltcedar symposium in Grand Junction.
- Encourage watershed organizations and water conservancy districts to take a leadership role in developing local partnerships to formulate and implement plans.
- Use school groups and youth groups for implementing treatments or providing monitoring (e.g., fuel reduction work and saltcedar removal in the County has also been carried out by the Western Colorado Conservation Corp [WCCC], which is trained in the above methods).
- Pursue Great Outdoors Colorado (GOCO) funds for treating saltcedar by the Colorado Division of Parks and Wildlife; this would alleviate hazardous fuels concerns on some state property in WUI areas of the Redlands and the Colorado River corridor.
- Use the local community spark plugs to facilitate access to private landowners with a saltcedar infestation.
- Engage with groups that are already active in removal of saltcedar as part of other County ventures: Colorado River Front Foundation and Commission, Mesa County Facilities and Parks Department, GOCO, Mesa Land Trust, Colorado State Parks, etc.

The contact for the Tamarisk Coalition is:
Stacey Kolegas
skolegas@tamariskcoalition.org
(970) 256-7400

The contact for the WCCC is:
J. Roberts
jroberts@mesapartners.org
(970)-241-1027

5.3.7 Fuel Breaks

Fire behavior in the County has been modeled using FlamMap. This assessment provides estimates of flame length and rate of spread; the information should be used by land managers when prescribing treatments. Based on this assessment, in areas exhibiting extreme fire behavior (e.g., communities in the Glade Park area), more intensive fuels treatments such as fire breaks (cut fuels to mineral soil) may be required. However, given the potential infestation by invasive species like cheatgrass, it is recommended that, where possible, fuels breaks (reduce fuel loading by cutting or mowing) are employed instead of fire breaks to maintain some vegetation cover. Land managers are cautioned, however, that neither fire breaks nor fuel breaks will stop a fire under extreme fire behavior or strong winds; these should only be seen as a mitigating measure and not a fail-safe method for fire containment. Furthermore, fuel break utility is contingent upon regular maintenance, as regrowth in a fuel break can quickly reduce its effectiveness.

Within a fuel break, shrubs should be removed where they would generate high-severity fire behavior. In riparian areas, trees should be pruned to a height of 8 to 16 feet (depending on the height of the fuel below the canopy) to address FlamMap outputs that show high flame lengths along the Colorado River corridor. It is not possible to provide a standard treatment prescription for the entire landscape because fuel break dimensions should be based on the local fuel conditions and prevailing weather patterns. For example, in some areas, clearing an area too wide could open the landscape to strong winds that could generate more intense fire behavior and/or create wind throw.

Strategic placement of fuel breaks is critical to prevent fire from moving from wildland fuels into adjacent neighborhoods. A fuel break of 100 to 300 feet in shrubland should modify fire behavior significantly enough to allow suppression by firefighters. It is important to note, however, that shrub fuels are often replaced by grassland fuels in shrubland fuel breaks; flame lengths and rates of spread could be faster in these grassland fuels, but fireline intensity (heat produced per unit area) will be reduced, allowing more effective suppression. For effective management of most fuels, fuel breaks should be prescribed based on the conditions in each particular treatment area. Some examples of this would be to place fuel breaks in areas where fuels are heavier or in areas with easy access for fire crews. Because of the dominant wind patterns in the County (i.e., out of the southwest), fuel breaks are recommended on the south and west sides of communities. In areas where the vegetation is discontinuous, fuel treatments may not be necessary. In this situation it is best to leave the site in its current condition to avoid the introduction of more flammable, exotic species like Russian thistle and cheatgrass, which respond readily following disturbance.

It is the responsibility of local governments to gather input from affected stakeholders, then determine which method(s) will safely accomplish the fuels management objectives for a given area. Well-managed fuels reduction projects often result in ecological benefits to wildlife and watershed health. Simultaneously, planning and resource management efforts should occur when possible while reducing fuels to ensure that the land remains viable for multiple uses in the long term. The effectiveness of any fuels reduction treatment will increase over time with a maintenance and monitoring plan. Monitoring will also ensure that objectives are being met in a cost-effective manner.

5.3.8 Fire Prevention Around Oil and Gas Infrastructure

Oil and gas facilities are a special type of infrastructure found in several locations in Mesa County. This infrastructure presents challenges to firefighters when a wildland fire threatens these facilities. Typical infrastructure includes wells, pipelines, tanks, pits, compressors, separators/dehydrators, treatment plants, and roads. Other temporary features can include drill rigs, hydrofracking operations, and various other completion operations. Firefighters must be aware of these special conditions and hazards that may include poisonous hydrogen sulfide and other gases, explosives, hazardous materials, narrow roads, and high vehicle traffic. Communication with oil and gas producers is essential for the safety of firefighters, industry workers, and the public. Fuels reduction around these structures is just as important as it is for homes and other buildings. It is important for the communities in the County to engage the oil and gas industry in protecting these areas from wildland fire.

5.4 RECOMMENDATIONS FOR PUBLIC EDUCATION AND OUTREACH

Needs for public education and outreach have been emphasized throughout the MCCWPP process by all participating parties. The Core Team has consistently commented on the need for better education of the public for fire preparedness, and discussions with community members during public outreach have indicated that most people are unaware of the danger of wildland fire in their community and could be better informed of effective mitigation options. Over 20% of people surveyed have stated that they would like more information and education regarding how they can reduce the risk of fire to their families and property, and 18% of people do not know what they needed to do in order to reduce fire risk. Table 5.4 lists recommendations for improving public education and outreach.

The people of the County have grown up with wildfire; however, it is important to continually raise awareness of fire risk and improve fire education (Winter and Fried 2000; McCaffrey 2004). One problem is reaching out to rural residents who do not consider themselves to be part of any particular community; it is difficult to communicate with a large but diffuse population. The recruitment of volunteer neighborhood leaders to participate in planning efforts or attend workshops on fire behavior and defensible space may prove to be the best option to disseminate available information.

Although many residents are familiar with Firewise Communities, many others could benefit from greater exposure to this program. Workshops demonstrating and explaining Firewise Communities principles have been suggested to increase homeowner understanding of home protection from wildfire. One goal is for communities to apply to become a Firewise Community, recognized in the State as a shining example for fire prevention. Information about the program is available at http://www.firewise.org/usa/index.htm. Greater participation in the Firewise Communities program could improve local understanding of wildfire and, in turn, improve protection and preparedness.

Other methods to improve public education could include providing signs indicating fire danger level (low, moderate, high, extreme) to be displayed in highly visible areas where they do not already exist; increasing awareness about fire department response and fire department resource needs; developing fire evacuation plans; providing workshops at demonstration sites showing Firewise Communities landscaping techniques or fuels treatment projects; organizing community cleanups; publicizing availability of government funds for thinning; and, most importantly, improving communication between homeowners and local land management agencies to improve and build trust.

Table 5.4. Recommendations for Public Outreach and Education

Project	Description	Presented By	Target Date	Resources Needed	Serves To
Targeted wildfire info sessions	Fund development of materials and presentations to highlight how a fire might affect particular groups within the community. Invite insurance companies to attend to discuss how fire risk can impact premiums.	Community fire representative or agency outreach personnel	Spring 2013	Funding for research, writing, and presentation of detailed information on how large-scale wildfire would affect the target audience and the measures that could be taken to reduce the threat. Flyers could be sent out with utility bills or other community mailings.	Deliver a clear and consistent message that impacts of wildfire are far-reaching and that it is in the best interest of a diverse set of stakeholders to become involved in planning and preparing for fire.
Fire departments open invitation days	Raise awareness of the fire departments through open house and tours of equipment.	VFDs	Annually	Advertising, refreshments, handouts.	Protect communities and infrastructure by potentially increasing recruitment and financial support for the fire service.
Neighbors for defensible space	Organize a community group made up of residents and agency personnel to develop materials and communicate relevant defensible space messages. Could coordinate with fire departments or with CSFS to spread message about the Landowner Assistance Program.	CSFS, fire departments, local residents	Spring 2013	Funding to help cover costs of materials and participation.	Engage diverse stakeholders in reaching out to community members and encourage defensible space practices. Over 20% of people surveyed in the County requested education and public outreach as a means for them to reduce their wildfire risk.
Media involvement	Develop a local newspaper column that provides fire safety information, promotional information for VFDs, fire announcements, and emergency planning.	Mesa County Public Information Officer, Emergency Manager, Sheriff, *Daily Sentinel*	Weekly column year-round	Columns, information, and articles to be provided by fire departments, CSFS, BLM, NPS, and USFS.	Protect communities and infrastructure through increasing public awareness and providing a channel for information regarding emergency fire response.
Involvement of railroad in fire and emergency planning	Increase coordination with railroad representatives to increase awareness of the ignition potential of the railroad and improving fire mitigation in the railroad corridor.	Railroad, County, state, and federal agencies	Summer 2013	Meeting venues, coordination, and facilitation.	Protect communities and infrastructure through uniting land managers in a plan to limit ignition potential and risks posed by the railway.
Increase signage	Increase fire prevention signage along highways and in public open space areas to reduce human ignitions.	County	Summer 2013	Signs, posts, people to post signs.	Protect communities and infrastructure by raising awareness of local citizens and those traveling in the County about actions that can prevent fire.
Improve enforcement of burn bans	Implement burn ban enforcement and raise public awareness of the ban.	County, fire districts	Summer 2013	Funding for increased numbers of enforcement officers.	Raise awareness of the dangers of burning on private property and emphasize that burning is illegal and will be punished.

Project	Description	Presented By	Target Date	Resources Needed	Serves To
Strengthen ordinances to allow enforcement of trash and debris clean-up on private property	Implement enforcement of clean-up and raise public awareness of the safety aspect of neglected yards and lots.	County	Summer 2013	Funding for increased numbers of enforcement officers. Incentives to encourage property owners to clean-up their properties.	Raise awareness of the dangers of trash and debris build-up on properties and the risk that yard waste and debris fuels can pose for fire danger. Many people surveyed commented that their properties were threatened by fire because of debris, weeds, and trash in their neighbors' yards.
Increase the use of prescribed burning as a fuels reduction method	Gain support for using prescribed burns to reduce fuel loads and to improve ecosystem health, where grazing needs allow.	BLM, other applicable agencies, private landowners	Summer 2013	Prescribed burn prescription, type-6 engines, hand crews, equipment.	Protect communities and infrastructure by reducing fuel loads.
Homeowner's guide	Develop a handbook that gives locally relevant and detailed information to help residents be more prepared for wildfire, including a defensible space checklist specific to local structural and wildland fuel considerations. Refer to Appendix G.	local fire departments, CSO Cooperative Extension Offices agents	Fall 2013	Funding to develop and print copies of the handbook. Volunteers to help distribute and explain the document.	Give residents detailed and locally specific tools that they can use to improve preparedness.
Emergency preparedness meetings	Use American Red Cross volunteers and other preparedness experts. Attend community functions and hold special meetings to provide guidance for creating household emergency plans.	American Red Cross, County personnel	Ongoing	Written materials.	Improve preparedness by facilitating the communication between family members and neighbors about what procedures to follow in the event of a wildfire.
Defensible space workshops	Attend all possible community meetings and hold additional workshops to educate homeowners about why and how to create effective defensible space.	Community fire representative or agency outreach personnel	Summer 2013, ongoing	Written materials, trained personnel.	Empower homeowners to make affordable and effective changes to reduce the vulnerability of individual homes.
Improved understanding of grass fire risk	Provide education and information about the risks associated with grass fires. Dispel misunderstanding that wildland fires affect only communities surrounded by timber.	VFDs, fire specialists, BLM, private landowners	Summer 2013	Information about the risks associated with grassland fires and examples of communities affected by grassland fires.	Protect communities and infrastructure through increased awareness.
Plan evacuation routes and inform communities	Work with emergency management officials to plan evacuation routes and then hold community meetings to disseminate to the public.	Emergency management officials	Fall 2013	GIS software or maps.	Protect communities and infrastructure through increased awareness.

Project	Description	Presented By	Target Date	Resources Needed	Serves To
Implement Firewise Communities programs	Work with communities to participate in Firewise Communities and prepare for fire events. Hold Firewise booths at local events, for example the Peach Festival in Palisade or during Fire Awareness Week each year.	County Emergency Management, CSFS, USFS	Fall 2013	Firewise Communities educational materials.	Protect communities and infrastructure through increased awareness and defensible space.

5.5 RECOMMENDATIONS FOR REDUCING STRUCTURAL IGNITABILITY

Table 5.5 provides a list of community-based recommendations to reduce structural ignitability that should be implemented throughout the MCCWPP planning area. Reduction of structural ignitability depends largely on public education that provides homeowners the information they need to take responsibility for protecting their own properties. Below is a list of action items that individual homeowners can follow (Section 5.5.1). Carrying out fuels reduction treatments on public lands may only be effective in reducing fire risk to some communities; however, if homeowners have failed to provide mitigation efforts on their own land, the risk of home ignition remains high and firefighter lives are put at risk when they carry out structural defense. Many committed members of the County serve their neighbors as volunteer firefighters, but these firefighting resources are continually stretched, particularly during a widespread wildfire. Preparing for wildland fire by creating defensible space around the home is an effective strategy for reducing structural ignitability. Studies have shown that burning vegetation beyond 120 feet of a structure is unlikely to ignite that property through radiant heat (Cohen and Butler 1996), but fire brands that travel independently of the flaming front have been known to destroy houses that had not been impacted by direct flame impingement. Education about managing the landscape around a structure, such as removing weeds and debris within a 30-foot radius and keeping the roof and gutters of a home clean, are two methods for creating defensible space. Educating people about the benefits of cutting trees and using Firewise Communities landscaping methods on their property is also essential for successful household protection.

It is important to note that no two properties are the same. Homeowners and communities are encouraged to research which treatments would have the most effect for their properties. Owners of properties on steep slopes, for example, should be aware that when constructing defensible space they have to factor in slope and topography, which would require extensions to the conventional 30-foot recommendations. A number of educational programs are now available to homeowners through local fire departments. CSFS representatives are also available to visit homes and advise residents on proper defensible space practices. Firewise is another great source of information about defensible space (www.firewise.org). More detailed information on structural ignitability can also be found in Appendix G (Homeowner's Guide).

Some structural ignitability hazards are related to homes being in disrepair, vacant or abandoned lots, and minimal yard maintenance. In order to influence change in homeowner behavior County ordinances may be needed.

Table 5.5. Recommendations for Reducing Structural Ignitability

Project	Private Lands/ Homeowner	Public Lands	Programs Available	Description	Possible Contacts for More Information	Priority
Offer fire protection workshops	All residents would be encouraged to participate	None	Community fire liaison, agency outreach personnel	Offer hands-on workshops to highlight individual home vulnerabilities and teach how-to techniques to reduce ignitability of common structural elements. Examples include installing metal flashing between houses and fences or decks, and installing wire mesh over eaves, vents, and under decks.	State Firewise Communities personnel, CSFS, Fire Chiefs	High
Strengthen building codes for new development	County	None	International Wildland-Urban Interface Code	The International Code Council enforces building codes and ordinances for new development in the WUI. Alternatively, planning applications could include information regarding defensible space and reducing structural ignitability.	State fire marshal, CSFS, Mesa County Planning Department	Moderate
Construct defensible space	All residents would be encouraged to participate	None	Firewise Communities, CSFS, local fire department liaison	Educate homeowners about defensible space practices following CSFS defensible space guidelines. Remove all but scattered trees within 30 feet of structures. Keep grass mown and green within 100 feet of structures. Keep flammable materials at least 30 feet from structures. Surround foundations with rocks or gravel to a width of 1 foot.	www.firewise.org or local Firewise Communities-trained personnel; CSFS Landowner Assistance Program (Appendix F)	High
Implement community clean-up days	All residents would be encouraged to participate in each community	None	Spring clean-up within City limits of Grand Junction	The City of Grand Junction provides free pick-up on designated days each spring. The dates and times are usually advertised in the local media. For communities outside the city limits residents could coordinate to borrow or rent a truck and trailer to collect green waste from participating neighbors and take to landfill or composting facilities.	City of Grand Junction Organic Materials Composting Facility: (970) 263-9319 3071 Highway 50 Grand Junction, CO 81503	High
Assess and improve accessibility to property	All residents would be encouraged to participate	None	Fire departments, code enforcement officers	Inform homeowners about the importance of keeping driveways accessible to fire trucks and emergency responders.	Local fire departments	Moderate
Provide list of mitigation measures to homeowners with different scales of actions	All residents would be encouraged to participate	None	Fire departments, Firewise Communities, USFS, BLM, NPS literature, academic and peer-reviewed literature	See list of action items below (Section 5.5.1).	UCR, CSFS, fire departments	High

5.5.1 Action Items for Homeowners to Reduce Structural Ignitability

Low or No Cost Investment (<$50)

- Regularly check fire extinguishers and have a 100-foot hose available to wet perimeter.
- Maintain defensible space for 30 feet around home (see Table 5.5). Work with neighbors to provide adequate fuels mitigation in the event of overlapping property boundaries.
- Make every effort to keep lawn mowed and green during fire season.
- Screen vents with non-combustible meshing with mesh opening not to exceed nominal ¼-inch size.
- Ensure that house numbers are easily viewed from the street.
- Keep wooden fence perimeters free of dry leaves and combustible materials. If possible, non-combustible material should link the house and the fence.
- Keep gutters free of vegetative litter. Gutters can act as collecting points for fire brands and ashes.
- Store combustible materials (firewood, propane tanks, BBQs) away from the house; in shed, if available.
- Clear out materials from under decks and/or stacked against the structure. Stack firewood at least 30 feet from the home, if possible.
- Reduce your workload by considering local weather patterns. Since the prevailing winds in the area are often from the southwest, consider mitigating hazards on the southwest corner of your property first, then work around to cover the entire area.
- Seal up any gaps in roofing material and enclose gaps that could allow fire brands to enter under the roof tiles or shingles.
- Remove flammable materials from around propane tanks.

Minimal Investment (<$250)

- When landscaping in the Home Ignition Zone (HIZ) (approximately 30 feet around the property), select non-combustible plants, lawn furniture, and landscaping material. Combustible plant material like junipers and ornamental conifers should be pruned and kept away from siding. If possible, trees should be planted in islands and no closer than 10 feet to the house. Tree crowns should have a spacing of at least 18 feet when within the HIZ. Vegetation at the greatest distance from the structure and closest to wildland fuels should be carefully trimmed and pruned to reduce ladder fuels, and density should be reduced with approximately 6-foot spacing between trees crowns (Figure 5.9).
- Box in eaves, attic ventilation, and crawl spaces with non-combustible material.
- Work on mitigating hazards on adjoining structures. Sheds, garages, barns, etc., can act as ignition points to your home.
- Enclose open space underneath permanently located manufactured homes using non-combustible skirting.

- Clear and thin vegetation along driveways and access roads so they can act as a safe evacuation route and allow emergency responders to access the home.
- Purchase or use a National Oceanic and Atmospheric Administration weather alert radio to hear fire weather announcements.

Figure 5.9. Structure requiring defensible space and fuels mitigation.

Moderate to High Investment (>$250)

- Construct a non-combustible wall or barrier between your property and wildland fuels. This could be particularly effective at mitigating the effect of radiant heat and fire spread where 30 feet of defensible space is not available around the structure.
- Construct or retrofit overhanging projections with heavy timber that is less combustible.
- Replace exterior windows and skylights with tempered glass or multilayered glazed panels.
- Invest in updating your roof to non-combustible construction. Look for materials that have been treated and given a fire-resistant roof classification of Class A. Wood materials are highly combustible unless they have gone through a pressure-impregnation fire-retardant process.
- Construct a gravel turnaround in your driveway to improve access and mobilization of fire responders.
- Treat construction materials with fire-retardant chemicals.
- Install a roof irrigation system.
- Replace wood or vinyl siding with nonflammable materials.
- Relocate propane tanks underground.

5.6 RECOMMENDATIONS FOR IMPROVING FIREFIGHTING CAPABILITIES

The County is divided into 13 fire protection districts. Despite the fact that the majority of the fire stations in these districts are served by volunteers, each of these departments have been proactive in seeking funds to support their services. Educating the public so they can reduce its dependence on fire departments is essential because these resources are often stretched thin during fire season. Greater emergency planning for communities is necessary, particularly those

communities in areas where response times for emergency services may be greater than in municipal zones. Table 5.6 provides recommendations for improving firefighting capabilities. Many of these recommendations are general in nature because they are applicable across districts. Districts should work together in implementing these actions and provide feedback to other Fire Chiefs on funding and grant successes, this way each district benefits from a lessons learned approach.

Table 5.6. Recommendations for Improving Firefighting Capabilities

Project	Fire Department	Description	Timeline	Contact	Priority
Provide minimum wildland Personal Protective Equipment for all firefighters in each district	All County fire departments	Seek grant money to be spent on acquisition of PPE. Task a member of each district to inventory PPE and investigate grant sources. Develop a schedule of equipment replacement to allow for allocation of funds and seeking of grants.	Monthly review of grant opportunities Annual audit of PPE	Review NFPA Standard 1977 Responsibility of Fire Chief, (Rural Fire Assistance funds – Doug Paul BLM), (volunteer fire assistance grants, CSFS), County Fire Warden	Very High
Develop a countywide, interagency forum for fire training	County, federal, and state	Develop an online forum where agencies and the County can post fire training schedules and districts can post training needs. This will allow District Chiefs to identify potential training opportunities for staff and volunteers in the local area, thereby saving training and travel costs incumbent upon departments and individuals.	Spring 2013	UCR Fire management Unit, CSFS, County Fire Warden	High
Create a countywide interagency training cadre	Countywide	There is a need to establish a routine class rotation across the County that will meet the training goals of each agency.	Spring 2013	UCR Fire Management Unit, County Fire Chiefs	High
Increase the number of “red-carded” individuals in each fire district	All County fire districts	Seek in-house training opportunities for NWCG Basic Wildland Fire Fighting and Fire Behavior, S-130/S-190 classes. Use online forum (described above) to facilitate scheduling. Work with federal agencies to develop evening and weekend courses for volunteers. Pursue online training programs and have trainees work with an in-house trained mentor to complete training. Facilitate Annual refresher participation by having in-house refreshers available or convene districts to have a county wide refresher. Utilize available funds for volunteers to participate in the annual Colorado Wildfire Academy.	Annually, or following recruitment drives	UCR Fire Management Unit, County Fire Warden	Very High

Project	Fire Department	Description	Timeline	Contact	Priority
Define specific qualification needs for each district	All County fire districts	Determine qualification needs and provide training to accomplish needs; e.g., in three years this department would like to have five Type II firefighters, two squad leaders, three driver/operators, two engine bosses, and one strike team leader/Type IV Incident Commander. This would aid in recruiting strategies, resource allocations, and mutual aid.	Project out 3 years	In-house, County Fire Warden	High
Create a training detail program between volunteer and paid departments	Countywide	Allow aspiring driver/operators and officers a chance to attend training and then perform in an acting capacity under the direct supervision of fully qualified personnel (in a different district if necessary). This will provide familiarity with the personnel, equipment, and procedures of a cooperating agency and allow volunteers to gain experience in a more active system.	Spring 2013	Fire Chief-discuss at Fire Chief meeting	High
Carry out detailed pre-incident planning workshops within districts and with neighboring districts and mutual aid partners	Countywide, fire districts and agency personnel	The CWPP identifies areas of high risk and hazard, allowing engine companies to target specific areas for tactical planning. The plan and associated GIS data can be used as a whole to assist planning at the strategic level. Issues of water and access are also addressed highlighting the need for infrastructure development.	Annually during winter months	All fire agencies	Very High
Develop a firefighting water resources map for each district	At the district level, particularly rural districts: Redlands, Glade Park, Gateway Unaweep, Lands End, Plateau Valley	Many communities were identified by Fire Chiefs, Core Team members, and the public as having limited water availability. Facilitating a more targeted assessment by local fire, roads, and water departments would help determine where gaps exist.	Fall 2012	Water Authorities, Mesa County	Very High.
Ease radio communication between federal and county operators	UCR	Federal operators work on VHF radio while County operators work on 800-MHz frequency, which are not inter-operable. The UCR dispatch proposes establishing operational response protocols in the Mesa County AOP for interfacing communication on differing frequencies. Technicians could be dispatched to “black box patch” radios at the incident. Alternatively grant funding can be used by districts to purchase VHF radios for use when communicating with federal operators.	Spring 2013-or upon update of Mesa County AOP	UCR Dispatch, Mesa County Sheriff’s Department	Moderate

Project	Fire Department	Description	Timeline	Contact	Priority
Increase VFD recruitment (diversify age classes)	All fire districts	Target fire education in schools to encourage younger generations to become interested in firefighting. Carry out recruitment drives through open house and mailings.	Annually	Fire Chiefs, school districts, Mesa County Public Information Officers	High
Increase funds for VFDs	All fire departments	1) Maintain contact with State Division of Fire Safety and regularly seek grant money. 2) Implement regular evaluations of resource needs for each VFD and make available to public to raise awareness of shortages. 3) Maintain updated list of district fires and provide to County. 4) Use local media to inform public of fire resources situation. Work with local newspaper editor to have a year-round column that documents fire department activities. 5) Apply for rural fire assistance program grants. 6) Improve International Standards Organization ratings.	Monthly review of grant opportunities	Fire Chiefs, County emergency manager, Fire Services staff, and County Managers to approach County Commissioners to raise the issue in commissioner meetings	High
Increase water sources and water delivery systems, particularly in areas adjacent to WUI	All fire departments	1) Obtain funding to purchase equipment and to implement rainwater harvesting or similar systems on all VFD stations. 2) Obtain portable dip tanks for fire departments 3) Strategically locate water storage on private lands with prior agreement from landowner to maintain water supply. Fire departments would have permission to access tanks in the event of wildfire.	Summer 2012 (this is an ongoing process)	Fire Chiefs	High
Ensure protection of municipal and district watersheds	All fire departments	Increase Intergovernmental cooperation between fire districts.	Summer 2012	Mesa County Sheriff's Office	High

6.0 MONITORING AND IMPLEMENTATION

Developing an action plan and an assessment strategy that identifies roles and responsibilities, funding needs, and timetables for completing highest-priority projects is an important step in organizing the implementation of the MCCWPP. Table 5.1 in the previous section identifies tentative timelines and monitoring protocols for fuels reduction treatments, the details of which are outlined below.

An often overlooked but critical component of fuels treatment is monitoring. It is important to evaluate whether fuels treatments have accomplished their defined objectives and whether any unexpected outcomes have occurred. In addition to monitoring mechanical treatments, it is important to carry out comprehensive monitoring of burned areas to establish the success of fuels reduction treatments on fire behavior, as well as monitoring for ecological impacts, repercussions of burning on wildlife, and effects on soil chemistry and physics. Adaptive management is a term that refers to adjusting future management based on the effects of past management. Monitoring is required to gather the information necessary to inform future management decisions. Economic and legal questions may also be addressed through monitoring. In addition, monitoring activities can provide valuable educational opportunities for students.

The monitoring of each fuels reduction project would be site-specific, and decisions regarding the timeline for monitoring and the type of monitoring to be used would be determined by project. Monitoring and reporting contribute to the long-term evaluation of changes in ecosystems, as well as the knowledge base about how natural resource management decisions affect both the environment and the people who live in it.

The most important part of choosing a monitoring program is selecting a method appropriate to the people, place, and available time. Several levels of monitoring activities meet different objectives, have different levels of time intensity, and are appropriate for different groups of people. They include the following:

Minimum—Level 1: Pre- and Post-project Photos

Appropriate for many individual homeowners who conduct fuels reduction projects on their properties.

Moderate—Level 2: Multiple Permanent Photo Points

Permanent photo locations are established using rebar or wood posts, and photos are taken on a regular basis. Ideally, this process would continue over several years. This approach might be appropriate for more enthusiastic homeowners or for agencies conducting small-scale, general treatments.

High—Level 3: Basic Vegetation Plots

A series of plots can allow monitors to evaluate vegetation characteristics such as species composition, percentage of cover, and frequency. Monitors then can record site characteristics such as slope, aspect, and elevation. Parameters would be assessed pre- and

post-treatment. The monitoring agency should establish plot protocols based on the types of vegetation present and the level of detail needed to analyze the management objectives.

Intense—Level 4: Basic Vegetation Plus Dead and Downed Fuels Inventory

The protocol for this level would include the vegetation plots described above but would add more details regarding fuel loading. Crown height or canopy closure might be included for live fuels. Dead and downed fuels could be assessed using other methods, such as Brown's transects (Brown 1974), an appropriate photo series (Ottmar et al. 2000), or fire monitoring (Fire Effects Monitoring and Inventory System [FIREMON]) plots.

6.1 IDENTIFY TIMELINE FOR UPDATING THE MCCWPP

While a specific timeline for updating the MCCWPP has not been determined as part of this document, the Core Team should continue to communicate after the plan is completed to discuss the best method for making revisions to reflect changing conditions. The HFRA allows for maximum flexibility in the CWPP-planning process, permitting the Core Team to determine the timeframe for updating the CWPP. It is suggested that the plan be revised at least every two years.

6.2 IMPLEMENTATION

The MCCWPP makes recommendations for prioritized fuels reduction projects as well as measures to reduce structural ignitability and carry out public education and outreach. Implementation of fuels reduction projects need to be tailored to the specific project and will be unique to the location depending on available resources and regulations. On-the-ground implementation of the recommendations in the MCCWPP planning area will require development of an action plan and assessment strategy for completing each project. This step will identify the roles and responsibilities of the people and agencies involved, as well as funding needs and timetables for completing the highest-priority projects (SAF 2004). Information pertaining to funding can be found in Appendix F.

6.3 CONCLUSION

The MCCWPP has been developed to meet the requirements of a CWPP as specified in the HFRA (as amended). The plan addresses how to prepare for wildland fire throughout the County and assesses the risk of this type of fire event creating damage to communities in WUI areas. The GIS risk assessment and field assessments of communities predicts high to extreme risk of catastrophic wildfire throughout the County, and in some cases close to communities. This assessment of risk is verified by the fire management professionals and emergency operators throughout the County.

The planning process emphasizes public participation and collaborative planning among federal, state, County, and local governments and other contributing agencies. The document makes recommendations for fuels reduction treatments, educational outreach activities, firefighting capabilities, and reduction of structural ignitability. The recommendations are based on a Composite Risk/Hazard Assessment, individual Community Risk/Hazard Assessments,

identification of CVARs, and comments from the Core Team and community members. The recommendations are general in nature to provide high levels of flexibility in the implementation phase. The public has provided input that is used to develop the recommendations through filling out surveys and talking with members of the Core Team. The public is aware of the need to implement mitigation measures around each individual's homes, but many are often not sure how to go about implementing these measures.

The goal of the MCCWPP is to reduce the risk for catastrophic wildfire throughout the County by providing specific information regarding what is most at risk and how to protect these places and community values from future fires. Fuels reduction can alleviate some of the risk but often reducing the potential for structural ignitability are the most effective ways in which homeowners can protect their homes and property. Most communities throughout the County are dependent on volunteer firefighting; with limited resources and funds, personnel become stretched particularly during fire season. The County is made up of a mosaic of private lands and federally managed lands; much of the implementation recommended in this plan falls to both private landowners, federal agencies and the County. It will be important for land management agencies to provide knowledge, skills, and funding assistance to these private landowners so that sufficient fire mitigation measures can be made. Moreover, collaboration between public and private entities is important in order to provide continuous landscape treatments to protect WUI communities. Lastly, the MCCWPP is a living document and should be revised as environmental conditions change or social issues arise.

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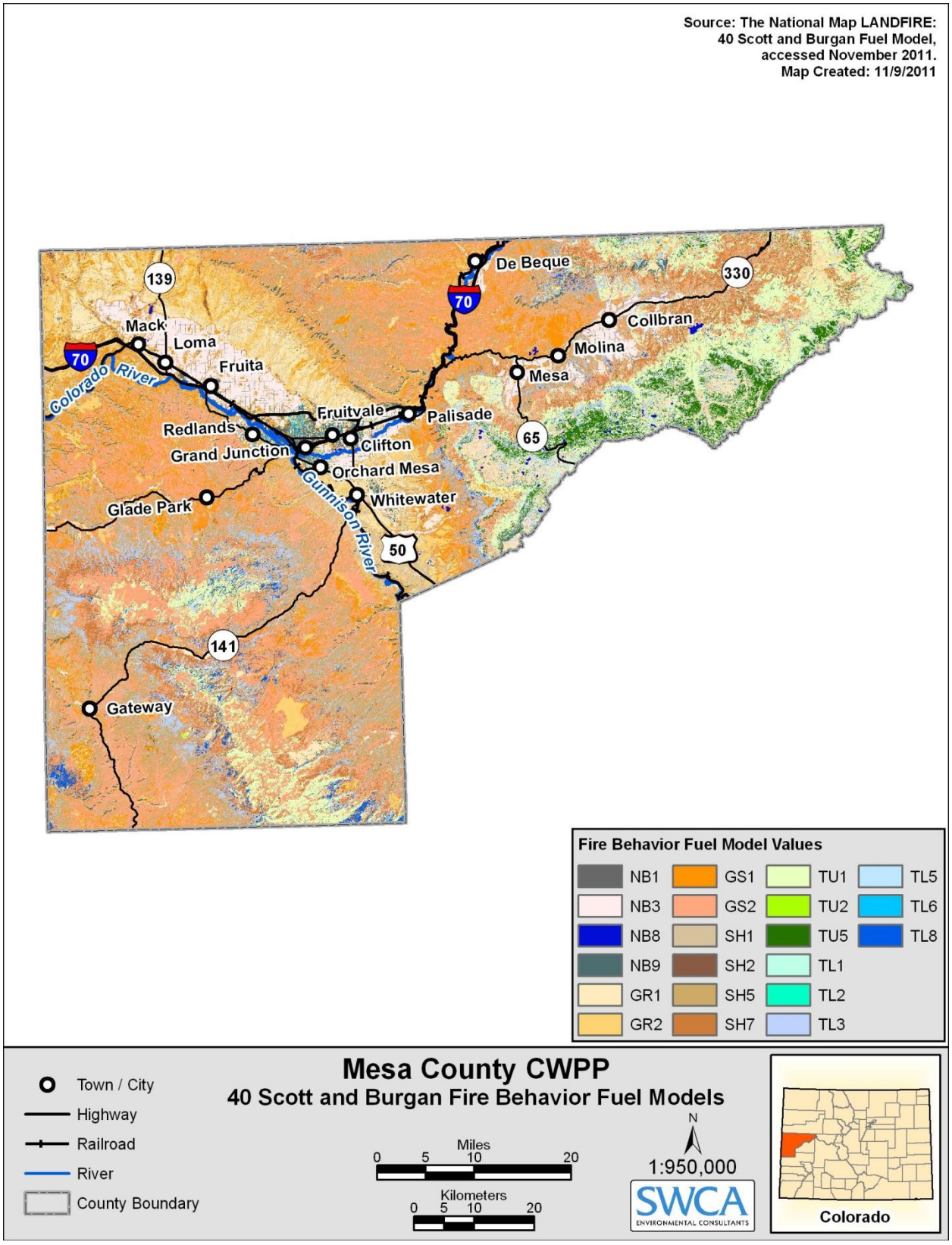
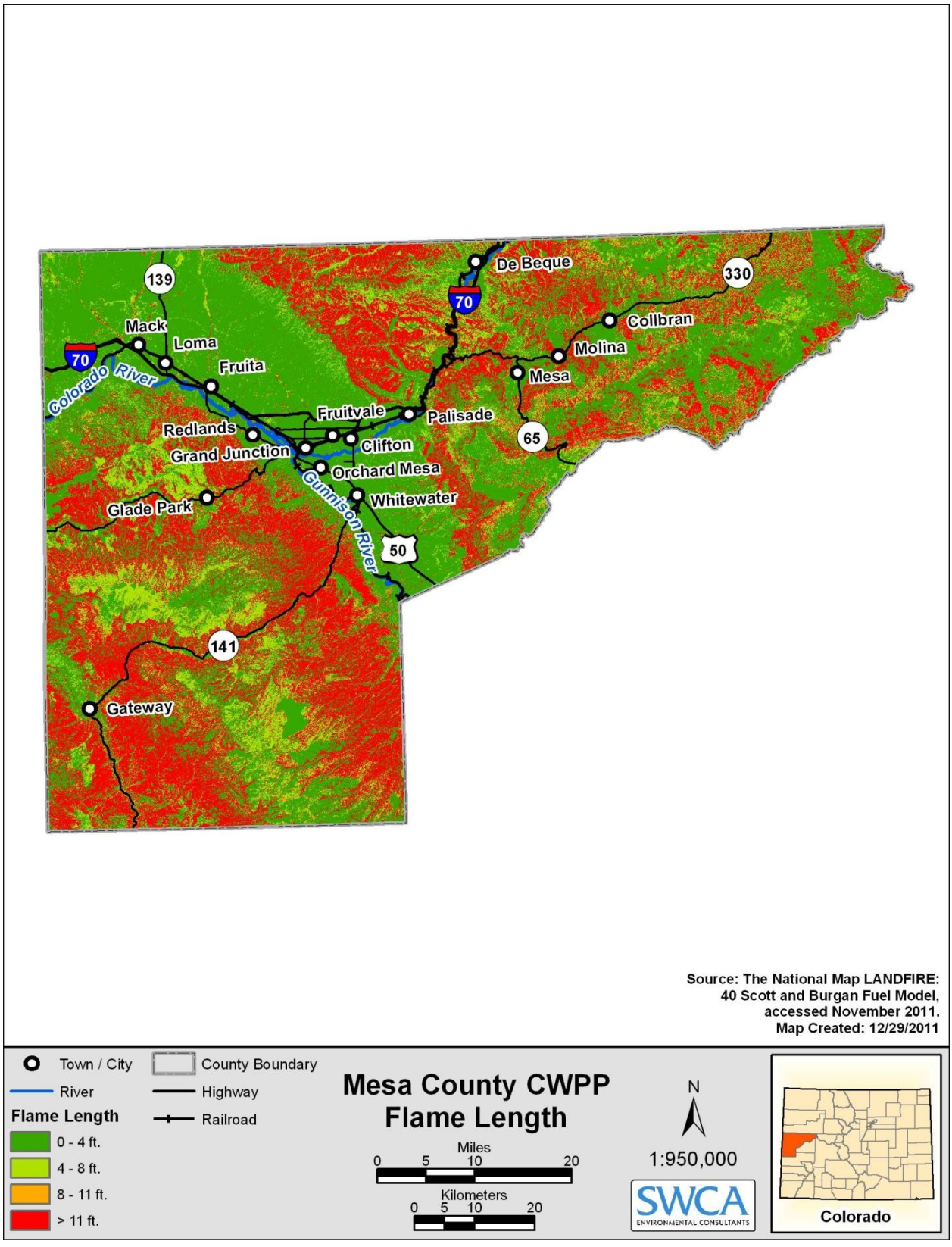
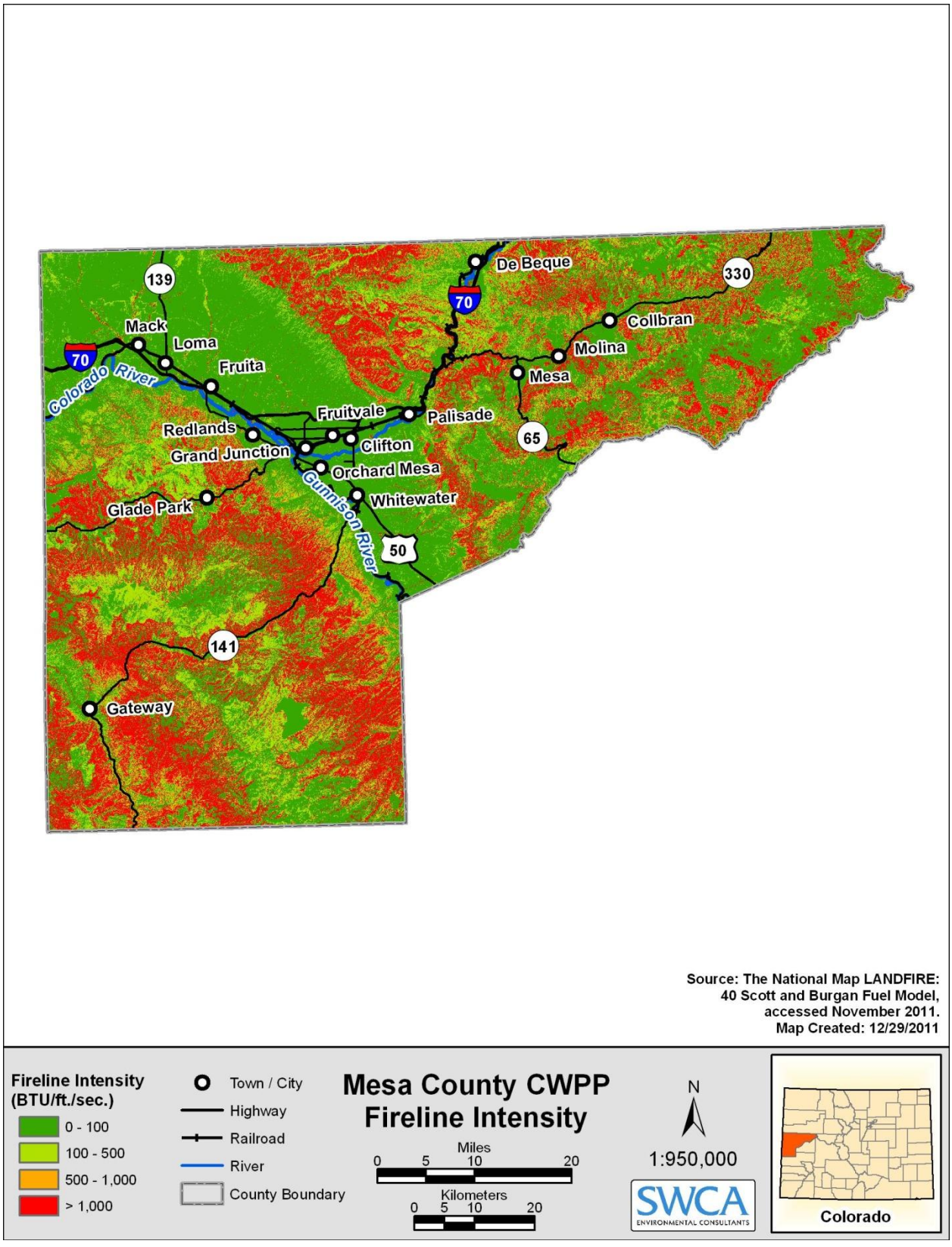
APPENDIX A
MAPS



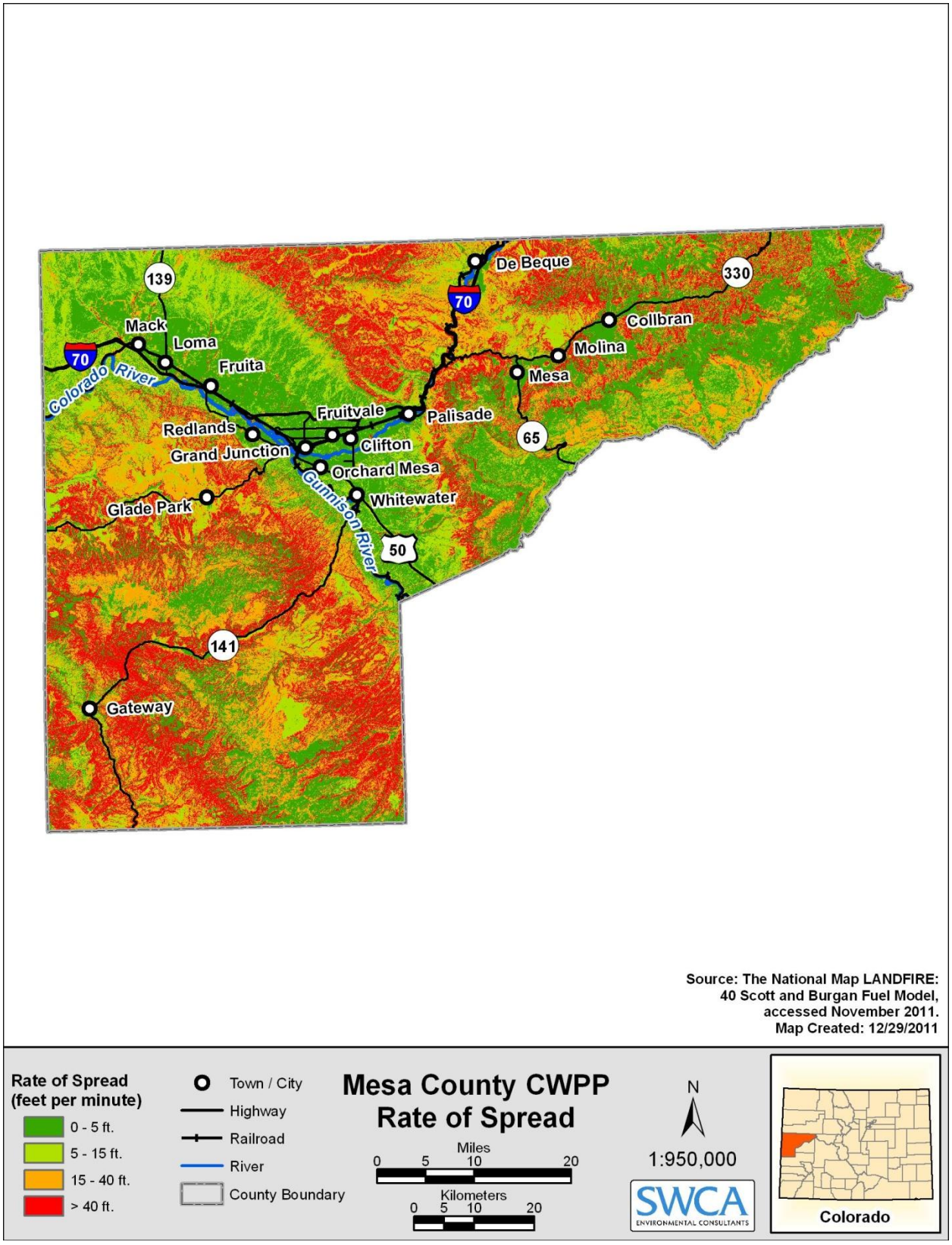
Map 1. Mesa County fuels.



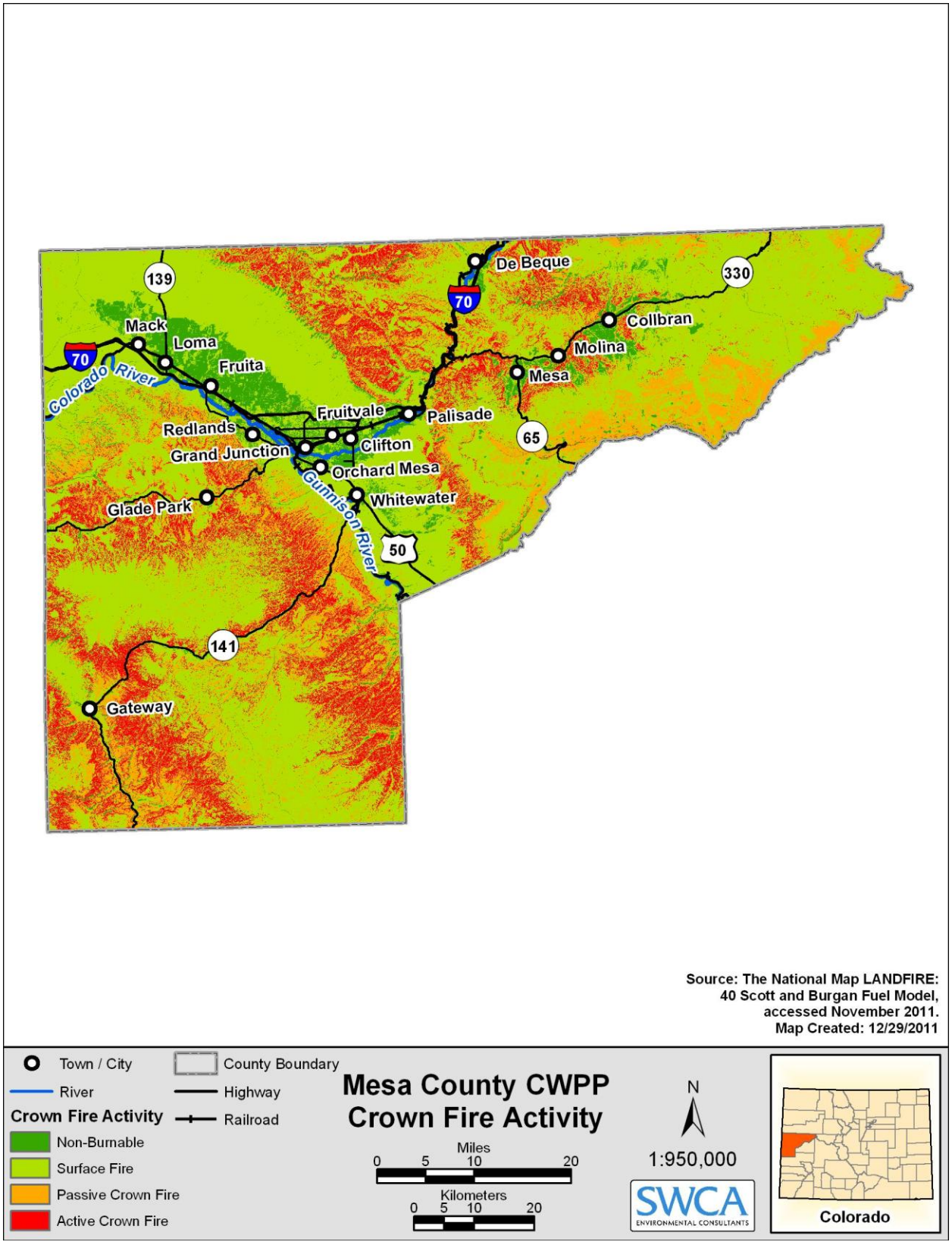
Map 2. Flame length.



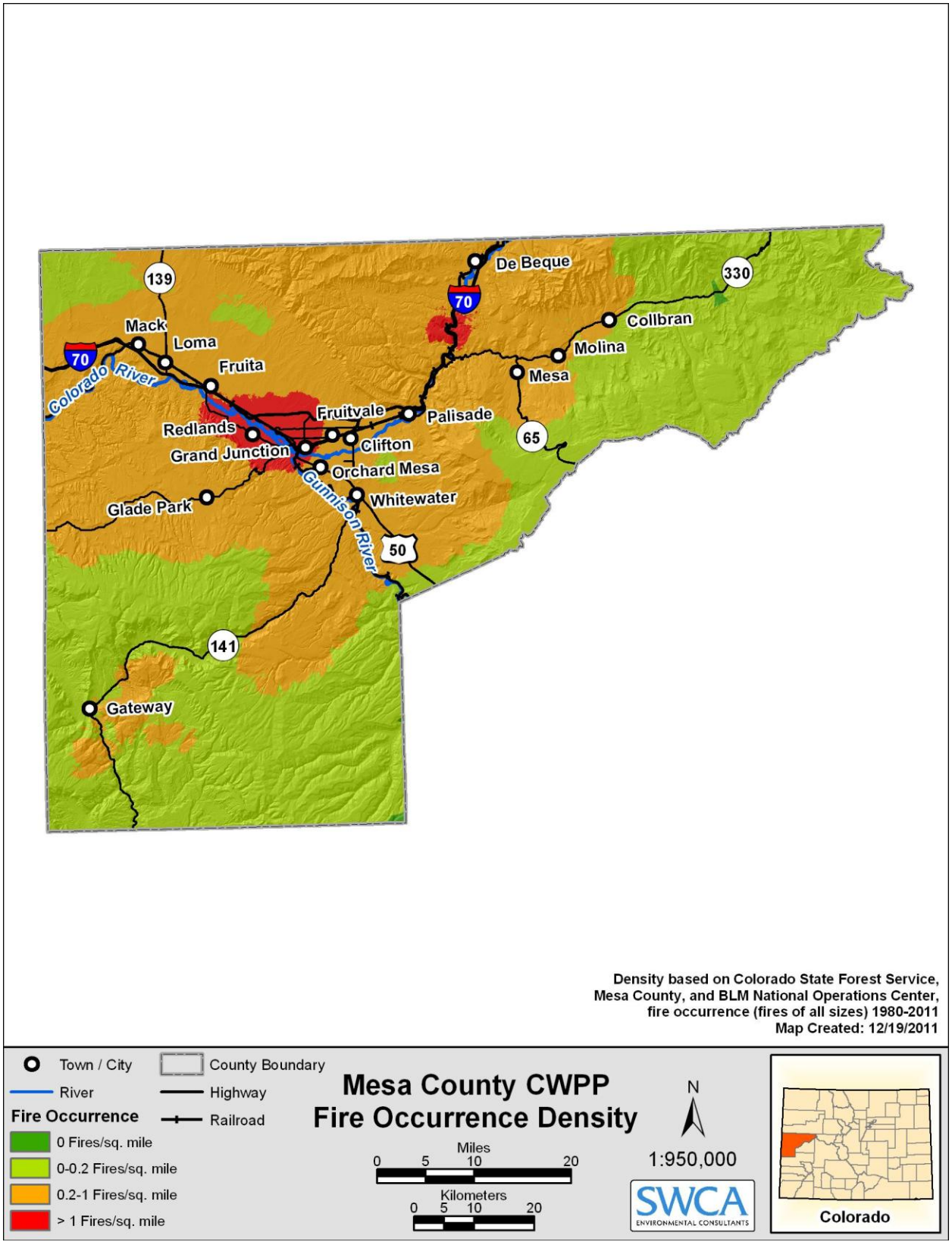
Map 3. Fireline intensity.



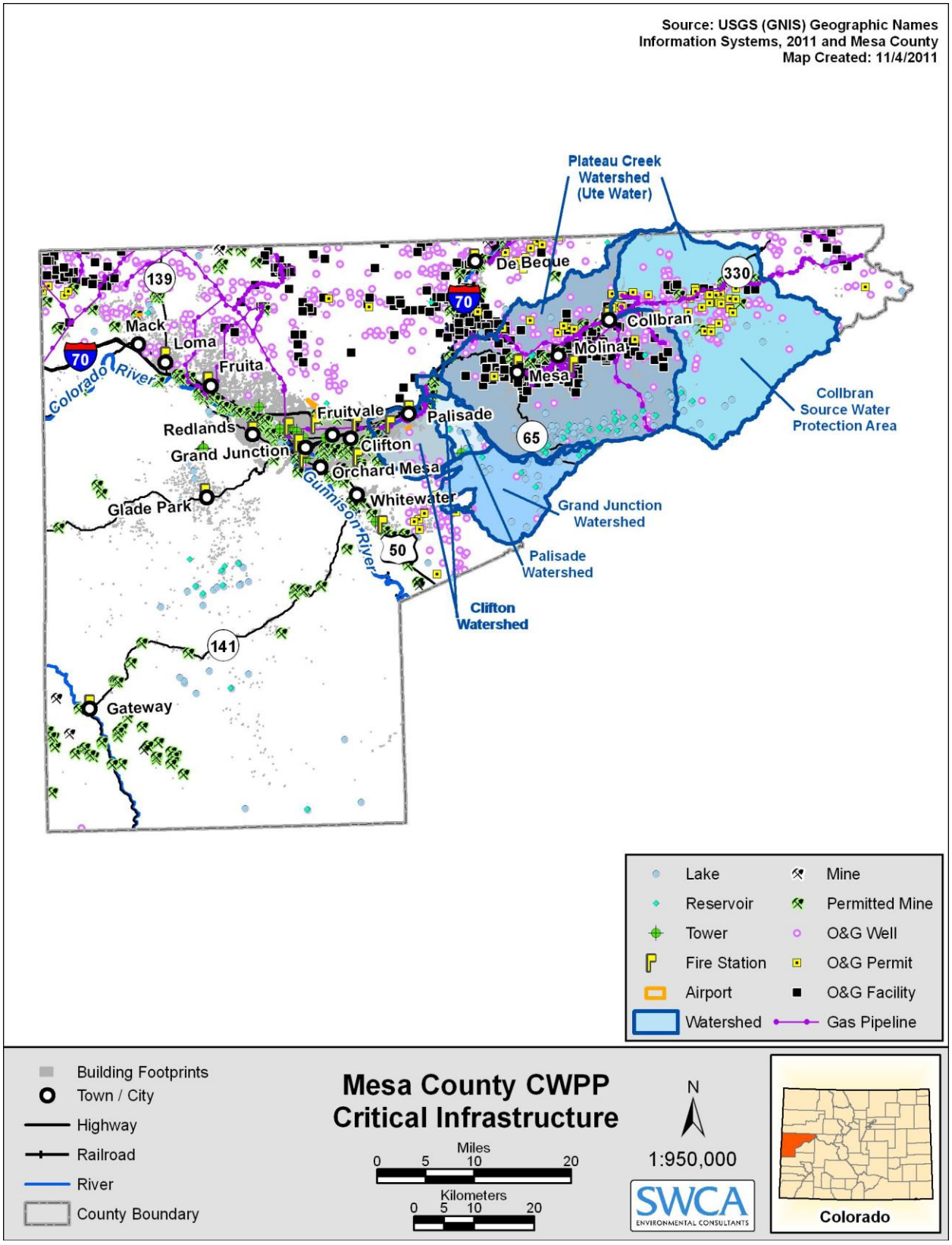
Map 4. Rate of spread.



Map 5. Crown fire potential.



Map 6. Fire occurrence.



Map 7. Critical infrastructure map.

APPENDIX B
CORE TEAM CONTACT LIST

Mesa County CWPP
Core Team List

Name	Agency or Organization	Position
Core Team Members		
Andrew Martsolf	Mesa County Office of Emergency Management	Emergency Manager
Mike Hill	Mesa County Office of Emergency Management	EMS Coordinator
Jim Fogg	Mesa County Sheriff's Department	Special Services Lieutenant
Chris Kadel	Mesa County	GIS
John Coleman	Mesa County Sheriff's Department	Deputy Fire Warden
Kelly Rogers	Colorado State Forest Service	District Forester
Joseph Flores	National Park Service	Fire Management Officer
Michelle Wheatley	National Park Service	Superintendant
Ross Oxford	National Park Service	Fuels Specialist
Russell Long	Upper Colorado River Interagency Fire Management Unit	West Zone Fire Management Officer
Lathan Johnson	Upper Colorado River Interagency Fire Management Unit	Fuels Specialist
Jeff Phillips	Upper Colorado River Interagency Fire Management Unit	Fuels Specialist
Doug Paul	Upper Colorado River Interagency Fire Management Unit	Fire Management Specialist
Bill Roth	Grand Junction Fire Department	Deputy Fire Chief
Frank Cavaliere	Lower Valley Fire Department	Fire Chief
Victoria Amato	SWCA Environmental Consultants	Project Manager
Amanda Kuenzi	SWCA Environmental Consultants	Fire Planner
Ryan Trollinger	SWCA Environmental Consultants	GIS fire modeling specialist
Stakeholder Participants		
Mike Lockwood	Plateau Valley Fire Protection District	Fire Chief
Rob Talbott	East Orchard Mesa Fire Department	Fire Chief
Dave Gitchell	Central Orchard Mesa Fire Department	Fire Chief
Richard Rupp	Palisade Fire Department	Fire Chief
Nick Marx	De Beque Fire Department	Fire Chief
Kent Holsan	Clifton Fire Department	Fire Chief
David Anderson	Gateway Unaweep Fire Department	Fire Chief
Rich Trotter	Glade Park Volunteer Fire Department	Fire Chief
James Wood	Lands End Fire Department	Acting Fire Chief
Stacy Kolegas Beaugh	Tamarisk Coalition	Executive Director
John Scronek	Upper Colorado River Interagency Fire Management Unit	UCR Dispatch Center Manager

APPENDIX C
COMMUNITY COMMENTS

Mesa County Community Wildfire Protection Plan
Community Comments

The following comments were compiled from the Glade Park Community Meeting (January 26, 2012) and Wingate Elementary Meeting (January 27, 2012), as well as additional comments noted in the community surveys.

- *There is a lack of water resources near the Colorado River Corridor- Redlands Village Subdivision. There was a fire there on July 4th 2004 and the area gets a lot of use by recreationists.*
- *Would like to see Pinon Mesa protected and prioritized for treatment.*
- *Would like to see focus on protecting hiking trails.*
- *Would like to see area above Mud Springs campground protected*
- *Would like to see Fruita Reservoir protected from wildfire.*
- *Would like to see the Fruita water pipeline protected from wildfire.*
- *Ensure public access roads are kept open, landowners have been closing public roads.*
- *Protect archaeological sites.*
- *Protect the Grand Junction Watershed.*
- *Protect homes and way of life as a priority.*
- *Protect old houses and outbuildings, these are cultural values.*
- *My home is vulnerable to wildfire because it is adjacent to the Walker Wildlife Refuge which is inaccessible to emergency vehicles in the event of a wildfire. The Refuge has thick fuels including Cheat grass and shrubs and there is no easy way to access to fight fire. There have been fires in the area in the past and there is a lot of public use of the land increasing ignition sources.*
- *My community needs more fire hydrants. The Redlands Village Subdivision has much fewer hydrants than neighboring subdivisions. There is a broken pipe between Sandcastle Lane, across Lime Kiln Gulch to Old Monument Village subdivision that reduces water flow to communities interfacing the wildlands.*
- *Have a history of high fire occurrence in our community- Redlands Village Subdivision.*
- *Redlands Village Subdivision is holding a Fire Prevention Education Meeting April 11th 7:30pm at Redlands Methodist Church. Community members are educating their neighbors in fire prevention.*
- *Redlands Village Subdivision is trying to work with Ute Water District and the Redlands Fire Department to install more fire hydrants and to repair the broken water line so that they have increased flow.*
- *We are concerned about wildfire risk from Walker Wildlife Refuge with which our home interfaces. There have been 3 fires in the area between 1990 and 2004.*
- *I would like to see the Redlands Fire Station listed as critical infrastructure and protection given to the Sewer lift station and Walker Wildlife Areas.*

- *I have trouble keeping up with brush and grass re-growth in previously cleared defensible space.*
- *Thank you so much for your presence and efforts with this plan.*
- *I would like to see the whole Glade Park area prioritized for protection.*
- *I would like to see wildlife protected from wildlife.*
- *I would like to see Coates School house protected.*
- *I would like to see Glade Park Community Center protected from wildlife.*
- *I would like to see the Glade Park School, post office and store protected from wildfire.*
- *We need more firefighters on the Glade Park Volunteer Fire Department roster.*
- *Brush removal is my biggest challenge to keeping my home safe.*
- *Weeds on my property are the greatest challenge to keeping my home safe.*
- *Homeowners must create their own defensible space, its common sense.*
- *There is a continuing need for more fire fighters on the Glade Park Volunteer Fire Department.*
- *I would like to see wildlife protected from wildfire.*
- *I would like to see old ranch and farm structures protected from wildfire.*
- *We would like information on how to fire safe our deck.*
- *We like to protect natural areas, private homes, NPS buildings, areas that distribute and maintain water, health services, municipal (I don't see a wild fire in downtown GJ...)*
- *Protect natural areas.*
- *Protect natural areas.*
- *Look into removal of tamarisk beetle killed trees.*
- *Protect natural areas and wildlife habitat.*
- *Mountain bike and hiking trails need to be protected from wildfire emergency equipment. Volunteers build the trails with hand tools, then the wildfire team gets to drive where ever they want in the name of "fighting a wildfire" –*
- *Self sufficiency of homeowners to protect their own property. Stricter regulation and enforcement of agricultural businesses.*
- *Protect cultural sites.*
- *Protect residential areas.*
- *Protect river fronts (inclusive, not just the Colorado) now that the beetles have killed the Tamarask* [sic]. *Use of beetle killed pine trees. Bio fuel compost timber or something.*
- *Protect schools, Natural areas.*
- *Protect areas where subdivision's, or concentrated housing areas, meet BLM.*
- *Protect cultural sites and municipal infrastructure.*
- *We need more fire hydrants in our subdivision- Orchard Mesa.*
- *Protect individual homes.*
- *Protect natural, cultural, private and public areas.*
- *Protect natural drainage such as leach creek etc. that run through our residential areas*
- *Protect housing*

- *Protect municipal infrastructure, cultural sites, natural areas*
- *Protect the fire department.*
- *Need public education, consultation for private property owners and perhaps even help from organizations such as the Sheriff's department chain gangs to help with clean-up.*
- *Need more education regarding burn permits and safety with regards to weather conditions and options for "green waste" disposal as an alternative to burning.*
- *Protect Colorado National Monument. Bang's Canyon recreation area*
- *Protect cultural sites.*
- *Protect natural areas.*
- *Protect historical areas, natural recreation areas.*
- *Protect public facilities and schools*
- *Protect natural areas*
- *Our subdivision is at considerable risk- Redlands Village Subdivision.*
- *Need water developments for the Redlands subdivision.*
- *Protect Redlands Village and Walker Wildlife Refuge.*
- *Protect the Glade Park Store*
- *Protect agricultural lands*
- *I hope to see these improvements in the near future.*
- *Need education as far as items to keep on hand (i.e. radios, food, etc.) but for wildfire, what are those things? Masks? Communication systems for the neighborhoods that are at-risk the most too.*
- *We need more patrols on public lands*
- *Need to protect the Glade Park Store, Community Center and School.*
- *The historic average every decade major fire burnoff up Kannah Creek that kept things under control have been interrupted by housing growth in the most vulnerable fire hazard areas for the last 30 years. The only cost effective way to keep things down is to keep it burnt off regularly, but it is now way too late. Combined w/non-native Russian Olive & Tamarisk super-growth, any fire that started now would be practically unstoppable.*
- *My neighborhood is fortunate to have a fire station less than a mile away...however, my concern is something happening when the fire trucks are out on another call.*
- *My farmer neighbor will light his field and let it burn my property because "he noticed I was home and could put it out if it got out of control".*
- *Better air quality monitoring and communication of health hazards to general population*
- *A general plan for fighting fires, where agricultural fields abut residential property is needed.*
- *All areas of Mesa County should be covered by a unified Fire District or authority. The current system is inequitable. Mesa County should only provide community education and coordination of local, state and federal resources.*

- *We need more fire hydrants for Redlands Village which has much fewer than new subdivisions. Ute Water need to repair the pipe on Sandcastle Lane. Also need treatment on federal lands, specifically on the Walker Wildlife Refuge which neighbors my property and is difficult to access. There are large fuel tanks across the Colorado River from Redlands Village and lots of fires including one on July 4th 2004. We have a fire prevention meeting planned for Redlands Village on April 11th at 7:30pm at the Redlands Methodist Church. We are already educating our subdivision. We are working to have Ute Water repair the pipeline water system and install more hydrants.*
- *Glade Park VFD needs more fire fighters and people should implement defensible space on their own property.*

APPENDIX D
FIREFIGHTING RESOURCES

FIRE SUPPRESSION VEHICLES - MESA COUNTY

Unit	Unit Number	ICS Type	Year/Make	Description	Weight	GPM	Tank Capacity	Notes
MESA COUNTY SHERIFF – Richard Acree, Fire Marshall								
Boat			2010	Thunder Jet				
Engine	102	4	1990 International				750	With foam capability
Engine	103	6	1990 Ford	F-350 4x4			200	16 hp pump
Engine	126	6	1999 Ford	F-450 4x4			300	With foam capability
Chase			2007 Chevrolet	Suburban				
Miscellaneous								2 float pumps, 3 pack pumps, 1 fold-a-tank, 1 1500-gallon snap tank
CENTRAL ORCHARD MESA – Dave Gitchell, District Chief 51								
Ambulance	51	3	1997 Ford	4x4 Ambulance	1 ton			ALS transport certified
Ambulance	52	3	1985 Ford	4x4 Ambulance Van	3/4 ton			ALS transport certified
Brush	51	6X	1996 Dodge	4x4	1 ton	90	230	Quick response engine with medical supply kit, foam
Brush	52	4X	1976 GMC	4x4 Becker Body Rescue	2 ton	500	400	Generator with lights, foam
Engine	51	1	2005 Freightliner	American LaFrance Pumper	5 ton	1250	1000	10 kw hydraulic generator with lights, extrication, foam
Engine	52	1	1984 Mack	Custom Pumper	5 ton	1250	500	Diesel, structure engine, generator with lights, extrication with medical, foam
Tender	51	1	1979 GMC General	Becker	52000	500	3500	
Miscellaneous								1 1000-gallon fold-a-tank, 2 port-a-pumps, 2 generators
CLIFTON – Kent Holsan, District Chief								
Ambulance	21	3	2006 Ford	450 Van				
Ambulance	22	3	2000 Ford	350 Van				
Boat	21		Grummen	17' Rescue				
Brush	21	4X	1987 Humvie	Brush Truck		100	300	300 psi
Engine	21	1	2002 Pierce	Class A Urban Pumper	5 ton	1500	500	Class A & B foam

FIRE SUPPRESSION VEHICLES - MESA COUNTY

Unit	Unit Number	ICS Type	Year/Make	Description	Weight	GPM	Tank Capacity	Notes
Engine	22	1	1991 Pierce	Rural Pumper	5 ton	1500	500	
Ladder	21	1	Pierce	4x2 Urban Pumper with Ladder	5 ton	1500	500	
Rescue	21		1996	Freightline 4x2	5 ton			Reserve support truck, with 50-gallon foam tank
Squad	21		2003	350 Utility Box				
DE BEQUE – Nick Marx, District Chief								
Ambulance	81	1X	2009 Ford	4x4 Power Stroke Ambulance	1 ton			Diesel
Ambulance	82	1X	2009 Ford	4x4 Power Stroke Ambulance	1 ton			Diesel
Brush	81	6X	2009 Dodge	4x4	1 1/2 ton		200	Diesel, with foam
Brush	82	6X	1997 Ford	4x4 Super Duty Power Stroke	1 1/2 ton		250	Diesel, with foam
Engine	81	1	2009 Spartan	4x2 Class A Pumper	5 ton	1250	1000	Diesel
Engine	82	1X	2009 International	4x4 Pumper	2 ton	1250	800	Diesel, 30-gallon Class A foam tank
Rescue	81	X	2009 Dodge	4x4 Fire/Rescue	1 1/2 ton			Generator, hydraulic tools
Tender	81	2	2009 International	Nurse Tender		1000	3500	Diesel, drop tank
Tender	82	2	1989 International	Tactical Tender		1000	4000	Diesel, drop tank
EAST ORCHARD MESA – Rob Talbott, District Chief								
Brush	61	X	1971 IHC	4x4 Rural Pumper	1 ton		250	
Engine	61		1989 FMC	Pumper	4-5 ton	1250	750	
Tender	61		1970 Ford	Rural Pumper/Water Tender	5 ton	1000	3000	Twin-screw
GATEWAY-UNAWEEP – David Anderson, District Chief								
Ambulance	121	2X	2006 Ford	F-350 4x4				Diesel
Ambulance	122	3	2011 GMC	F-450				Diesel
Ambulance	123	X	1995 Ford	F-350 4x4				Diesel
Brush	121	6X	1993 Ford	F-350 4x4		200	300	Diesel

FIRE SUPPRESSION VEHICLES - MESA COUNTY

Unit	Unit Number	ICS Type	Year/Make	Description	Weight	GPM	Tank Capacity	Notes
Brush	122	5X	1999 International	4x4 Heavy	2 1/2 ton	700	1000	Diesel
Engine	121	3	1983 Pirsch			800	500	Diesel
Tender	121	3X	1956	AM General	2 1/2 ton		1000	Diesel, owned by the CSFS
Tender	122		1986	Volvo			2100	Diesel
GLADE PARK – Rich Trotter, District Chief								
Brush	B-71		1995 Ford	Power Stroke	1 ton		300	With foam
Brush	B-72	X	1999 Ford	4x4 Power Stroke Brush 72	1 ton		300	With foam
Engine	E-71	4X	1967 Kaiser	6x6 Rural Pumper	2 1/2 ton		1000	Owned by the CSFS
Engine	E-72		1978 Ford	C 800 Structure Engine		700	1000	Diesel
Engine	E-73		1991 International	4x4 Brush Engine	2 1/2 ton		800	With Class A foam
Rescue	R-72	X	Chevy	4x4 Rescue Squad				
Tender	T-71		International	Tender with Pump			3800	
Tender	T-72		International	6x6 with Deck Monitor			3400	
Miscellaneous								4 - 1 1/2" float pumps
GRAND JUNCTION – Ken Watkins, District Chief								
GRAND JUNCTION Station 1								
Ambulance 1	3038		2001 Ford	F-450 Type III				
Ambulance 6	1643		2006 Ford	F-450 Type III				
Battery 1	3318		2007 Chevrolet	Tahoe				
Code Enforcer	1631		2006 Chevy	Pickup				
Code Enforcer	1819		2008 Honda	Civic				
Code Enforcer	2007		2004 Ford	F-150				
Engine 16	504		1996 E-One	Custom Pumper		1250	500	30-gallon foam capacity
Fire Inv.	2437		2005 Ford	F-250				

FIRE SUPPRESSION VEHICLES - MESA COUNTY

Unit	Unit Number	ICS Type	Year/Make	Description	Weight	GPM	Tank Capacity	Notes
Operations	2450		2005 Chevy	TrailBlazer				
Chief								
PIO	2109		2001 Ford	Windstar				
Rescue 11	1226		2000 SVI	Heavy Rescue Truck		250	328	30-gallon foam capacity
Truck 4	1344		1999 E-One	75' Ladder Truck		1500	500	30-gallon foam capacity
GRAND JUNCTION Station 2								
Ambulance 12	1641		2006 Ford	F-450 Type III				
Ambulance 17	935		2006 Ford	F-450 Type III				
ATV/Brush	374		1990 ATV					
Engine 12	2124		1999 E-One	Pumper		1250	500	30-gallon foam capacity
Hazmat 12	2358		2002 Ford	F-550 with Crew Cab				
Hazmat	1340		1998	Trailer				
GRAND JUNCTION Station 3								
Ambulance 13	3323		2002 Ford	E-450 Lifeline Type III				
ATV	432		1993 ATV	Snow Removal				
ATV Trailer	364		1990 ATV	Trailer				
Engine 13	1042		2000 E-One	Rescue/Pumper		1250	500	30-gallon foam capacity
Hazmat 13	BLM		1993/2004	Trailer/Truck				
Tender 13	003		1999 E-One	Water Tender		1250	2500	30-gallon foam capacity
GRAND JUNCTION Station 4								
Boat 14	1405		2006	Lowe, 16 Ft., Aluminum				
Boat Trailer	393		2005	Trailer				
Engine 14	1503		2000 E-One	Custom Pumper		1250	500	30-gallon foam capacity
Engine 17	1124		1993 KME	Pumper		1250	500	30-gallon foam capacity
Squad 14	1402		2003 Ford	F-250 Rescue				
GRAND JUNCTION Station 5								

FIRE SUPPRESSION VEHICLES - MESA COUNTY

Unit	Unit Number	ICS Type	Year/Make	Description	Weight	GPM	Tank Capacity	Notes
Air Supply	008		1999	Cascade/Compressed Trailer				
Brush 15	2322		1999 Ford	F-450				
Engine 15	002		2000 E-One	Custom Pumper		1250	500	Foam capacity - 30 gallons
Rescue 15	001		1997 Freightliner	Mass Casualty Truck				
R 15 Trailer	001-A		1999					
Tender 15	005		2000 E-One	Tender		500	2000	
Trench Rescue	018		2000	Confined Space Trailer				
GRAND JUNCTION 23 Road Storage								
Bomb Truck	019							
Bomb Trailer	1319							
LANDS END – James Wood, Acting District Chief								
Ambulance	111		2003 Ford	F-450 Fully Equipped ALS	2 Ton			
Brush	111		1994 Chevy	4X4 Dually, Slide in unit	1 ton	250	250	
Engine	111		2000 Pierce	Pumper with foam unit	5 Ton	1250	1000	
Rescue	111		1997 Ford	F-350 4X4 Utility	1 Ton			With generator
Tender	111		2004 Freightliner	Water Tender, with pump	14 Tons	250	2000	
LOWER VALLEY – Frank Cavaliere, District Chief								
Ambulance	31	3	2006 Ford					
Ambulance	32	3	2010 Dodge					Diesel
Ambulance	33		2003 Ford					
Brush	31	6X	2002 Ford	4x4	2 ton	250	250	Class A foam
Brush	32	6X	1999 Ford	4x4	1 1/2 ton	250	300	With 2 foam tanks
Command	31		2005 Chevy	Trail Blazer				
Engine	31	1	2005 Pierce	Structure Engine		1750	1000	Class A foam

FIRE SUPPRESSION VEHICLES - MESA COUNTY

Unit	Unit Number	ICS Type	Year/Make	Description	Weight	GPM	Tank Capacity	Notes
Engine	32	1	2006 Pierce	Structure Engine		1500	500	Diesel, with Class A foam
Ladder	31		1984 Duplex	75' Ladder Truck		1500	500	
Rescue	34		1993 International	4x2 Tender	10 ton	1000	500	With compressed air foam
Tender	31	2	2007 Sterling				4500	With port-a-tank
Tender	32		1975 Ford				3600	With port-a-tank
Miscellaneous								1 4000-gallon fold-a-tank, 1 float-a-pump, 1 port-a-pump, 2 generators
PALISADE – Richard Rupp, District Chief								
Ambulance	A-41		2005 Ford E-350	Ambulance	14,050			Diesel, ALS equipped
Ambulance	A-42		2010 GMC	Ambulance	14,200			Diesel, ALS equipped
Brush	B-41	6X	1992 Ford	F-350 4x4 Type 6	11,000		200	Diesel, with foam
Command	C-41		2003 Ford Excursion	Command Vehicle				Diesel
Engine	E-41		2006 Spartan	4x2 Urban Pumper	42,000	1500	750	Diesel, with foam
Engine	E-42		1983 FMC	4x2 Omega Urban Pumper	37,180	1250	750	Diesel
Ladder	L-41		1982 Penfab	6x2 55' Aerial Ladder-Pumper	48,000	1250	1000	Diesel
Tender	T-41		1984 International	Tender	50,000	750	3600	Diesel
Miscellaneous								1 3000-gallon fold-a-tank, 1 portable pump, 1 floating pump
PLATEAU VALLEY – Mike Lockwood, District Chief								
PLATEAU VALLEY Station 91 (Collbran)								
Ambulance	A-91	X	2004 GMC	3500 4X4				
Brush	B-91		2000 Ford	F-550 4x4 with Crew Cab		31	350	40-gallon Class A & B foam
Brush	B-95	5	1993 International	4x4 Pumper		31	500	25-gallon foam, pump and roll
Engine	E-91	6	2000 Ford F-550	4x4 with Crew Cab			350	40-gallon Class A & B foam

FIRE SUPPRESSION VEHICLES - MESA COUNTY

Unit	Unit Number	ICS Type	Year/Make	Description	Weight	GPM	Tank Capacity	Notes
Tender	T-91	2	2010 Freightliner	2x6		400	3500	PTO pump with 3500-gallon frameless drop tank
PLATEAU VALLEY Station 92 (Mesa)								
Ambulance	A-92	X	2009 Ford	4x4 Power Stroke Ambulance				
Brush	B-93		2003 Dodge Ram	2500 4x4				
Brush	B-92		2000 Ford	4x4				
Brush	B-94		1999 International	4x4				
Command	C-91		1998 Suburban	4x4	1/2 ton			VHF Repeater
Engine	E-93	1	2008 Crimson	4x4 Pumper		1500	1000	25-gallon foam, pump and roll
PLATEAU VALLEY Station 93 (Molina)								
Brush	B-93	6	2002 Dodge 3500	4x4 Heavy Brush Truck				Foam, quick dump, snap tank
Chief	C-92		2008 Dodge Durango	4x4			2000	
EMS	E-92		2008 Dodge Ram	2500 4x4				
Engine	E-93	2	1980 Ford	4x2		1500	750	
Tender	T-93	3	1991 Ford F-880	Short Wheel Base			2000	
Miscellaneous								2 Rhino ATVs, 4 Arctic Cat Snowmobiles/Sleds

APPENDIX E
WILDFIRE FIRE RISK AND HAZARD SEVERITY FORM
NFPA 1144

Wildfire Fire Risk and Hazard Severity Form NFPA 1144

Means of Access						
Ingress and Egress	**Points**					
Two or more roads in and out	0					
One road in and out	7					
Road Width						
>24 feet	0					
>20 feet, <24 feet	2					
<20 feet	4					
Road Conditions						
Surfaced road, grade <5%	0					
Surfaced road, grade >5%	2					
Nonsurfaced road, grade <5%	2					
Nonsurfaced road, grade >5%	5					
Other than all season	7					
Fire Access						
<300 feet with turnaround	0					
>300 feet with turnaround	2					
<300 feet with no turnaround	4					
>300 feet with no turnaround	5					
Street Signs						
Present–reflective	0					
Present–nonreflective	2					
Not present	5					
Vegetation (fuel models)						
Predominant veg						
Light–1,2,3	5					
Medium–5,6,7,8,9	10					
Heavy–4,10	20					
Slash–11,12,13	25					
Defensible Space						
>100 feet around structure	1					
>70 feet, <100 feet around structure	3					
>30 feet, <70 feet around structure	10					
<30 feet around structure	25					
Topography within 300 Feet of Structures						
Slope						
<9%	1					
10% to 20%	4					
21% to 30%	7					
31% to 40%	8					
>41%	10					
Additional Rating Factors (rate all that apply)						
Additional Factors						
Topographic features	0–5					
History of high fire occurrence	0–5					
Severe fire weather potential	0–5					
Separation of adjacent structures	0–5					

Roofing Assembly						
Roofing						
Class A	0					
Class B	3					
Class C	15					
Unrated	25					
Building Construction						
Materials (predominant)						
Non-combustible siding, eaves, deck	0					
Non-combustible siding/combustible desk	5					
Combustible siding and deck	10					
Building Set-back						
>30 feet to slope	1					
<30 feet to slope	5					
Available Fire Protection						
Water Sources						
Hydrants 500 gpm, <1,000 feet apart	0					
Hydrants 250 gpm, <1,000 feet apart	1					
Nonpressurized, >250 gpm/2 hrs	3					
Nonpressurized, <250 gpm/2hrs	5					
Water unavailable	10					
Organized Response						
Station <5 miles from structure	1					
Station >5 miles from structure	3					
Fixed Fire Protection						
NFPA sprinkler system	0					
None	5					
Placement of Gas and Electric Utilities						
Utilities						
Both underground	0					
One above, one below	3					
Both above ground	5					

Totals for Home or Subdivision					

Hazard Rating Scale
<40 Low
>40 Moderate
>70 High
>112 Extreme

APPENDIX F
FUNDING OPPORTUNITIES

MESA COUNTY CWPP
FUNDING OPPORTUNITIES

The following section provides information on federal, state, and private funding opportunities for conducting wildfire mitigation projects.

I. Federal Funding Information

Source: Pre-disaster Mitigation Grant Program
Agency: Department of Homeland Security Federal Emergency Management Agency (DHS FEMA)
Website: http://www.fema.gov/government/grant/pdm/index.shtm
Description: The DHS includes FEMA and the U.S. Fire Administration. FEMA's Federal Mitigation and Insurance Administration is responsible for promoting pre-disaster activities that can reduce the likelihood or magnitude of loss of life and property from multiple hazards, including wildfire. The Disaster Mitigation Act of 2000 created a requirement for states and communities to develop pre-disaster mitigation plans and established funding to support the development of the plans and to implement actions identified in the plans. This competitive grant program, known as PDM, has funds available to state entities, tribes, and local governments to help develop multihazard mitigation plans and to implement projects identified in those plans.

Source: Funding for Fire Departments and First Responders
Agency: DHS, U.S. Fire Administration
Website: http://www.usfa.dhs.gov/fireservice/grants/
Description: Includes grants and general information on financial assistance for fire departments and first responders. Programs include the Assistance to Firefighters Grant Program, Reimbursement for Firefighting on Federal Property, State Fire Training Systems Grants, and National Fire Academy Training Assistance.

Source: Conservation Innovation Grants (CIG)
Agency: National Resource Conservation Service
Website: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1046372.pdf
Description: CIG State Component. CIG is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production. Under CIG, Environmental Quality Incentives Program (EQIP) funds are used to award competitive grants to non-federal governmental or nongovernmental organizations, tribes, or individuals. CIG enables the Natural Resources Conservation Service (NRCS) to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the nation's most pressing natural resource concerns. CIG will benefit agricultural producers by providing more options for environmental enhancement and compliance with federal, state, and local regulations. The NRCS administers the CIG program. The CIG requires a 50/50 match between the agency and the applicant. The CIG has two funding components: national and state. Funding sources are available for water resources, soil resources, atmospheric resources, and grazing land and forest health.

Source: Volunteer Fire Assistance
Agency: USDA Forest Service
Website: http://www.fs.fed.us/fire/partners/vfa/
Description: USDA Forest Service funding will provide assistance, through the states, to volunteer fire departments to improve communication capabilities, increase wildland fire management training, and purchase protective fire clothing and firefighting equipment. For more information, contact your state representative; contact information can be found on the National Association of State Foresters website.

Source: Woody Biomass Utilization Programs
Agency: Forests and Rangelands
Website: http://www.forestsandrangelands.gov/Woody_Biomass/opportunities.shtml
Description: Forests and Rangelands is a cooperative effort between the United States Department of the Interior, the United States Department of Agriculture, and their land management agencies. They provide information and links to opportunities for grants and financial assistance for woody biomass research, development, and projects.

Source: Collaborative Forest Landscape Restoration Program
Agency: USDA Forest Service
Website: http://www.fs.fed.us/restoration/CFLR/index.shtml
Description: USDA Forest Service funding will provide cost share funding to encourage the collaborative, science-based ecosystem restoration of priority forest landscapes. The program is meant to encourage ecological, economic, and social sustainability by combining local resources with national and private resources. The program facilitates the reduction of wildfire management costs through reestablishing natural fire regimes and reducing the risk of uncharacteristic wildfire.

Source: Catalog of Federal Funding Sources for Watershed Protection
Agency: N/A
Website: http://cfpub.epa.gov/fedfund/
Description: This website is a searchable database for financial assistance (in the form of grants, loans, and cost-sharing) available for a variety of watershed protection projects. Examples of the types of grants found at this site are:

- Native Plant Conservation Initiative: http://www.nfwf.org/AM/Template.cfm?Section=Browse_All_Programs&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=3966
- Targeted Watershed Grants Program: http://www.epa.gov/owow/watershed/initiative/
- Pre-disaster Mitigation Program: http://www.fema.gov/government/grant/pdm/index.shtm
- Environmental Education Grants: http://www.epa.gov/region8/ee/

Source: Firewise
Agency: Multiple
Website: http://www.firewise.org
Description: The Wildland/Urban Interface Working Team (WUIWT) of the National Wildfire Coordinating Group is a consortium of wildland fire organizations and federal agencies responsible for wildland fire management in the United States. The WUIWT includes the USDA Forest Service, USDI Bureau of Indian Affairs, USDI BLM, USDI Fish and Wildlife Service, USDI National Park Service, FEMA, U.S. Fire Administration, International Association of Fire Chiefs, National Association of State Fire Marshals, National Association of State Foresters, National Emergency Management Association, and National Fire Protection Association. Many different Firewise Communities activities are available help homes and whole neighborhoods become safer from wildfire without significant expense. Community cleanup days, awareness events, and other cooperative activities can often be successfully accomplished through partnerships among neighbors, local businesses, and local fire departments at little or no cost. The Firewise Communities recognition program page (http://www.firewise.org/usa) provides a number of excellent examples of these kinds of projects and programs.

The kind of help you need will depend on who you are, where you are, and what you want to do. Among the different activities individuals and neighborhoods can undertake, the following actions often benefit from some kind of seed funding or additional assistance from an outside source:

- Thinning/pruning/tree removal/clearing on private property—particularly on very large, densely wooded properties
- Retrofit of home roofing or siding to non-combustible materials
- Managing private forest
- Community slash pickup or chipping
- Creation or improvement of access/egress roads
- Improvement of water supply for firefighting
- Public education activities throughout the community or region

Some additional examples of what communities, counties, and states have done can be found in the National Database of State and Local Wildfire Hazard Mitigation Programs at http://www.wildfireprograms.usda.gov. You can search this database by keyword, state, jurisdiction, or program type to find information about wildfire mitigation education programs, grant programs, ordinances, and more. The database includes links to local websites and e-mail contacts.

Source: The National Fire Plan
Agency: Forests and Rangelands
Website: http://www.forestsandrangelands.gov/
Description: Many states are using funds from the NFP to provide funds through a cost-share with residents to help them reduce the wildfire risk to their private property. These actions are usually in the form of thinning or pruning trees, shrubs, and other vegetation and/or clearing the slash and debris from this kind of work. Opportunities are available for rural, state, and volunteer fire assistance.

Source: Staffing for Adequate Fire and Emergency Response (SAFER)
Agency: DHS
Website: http://www.fema.gov/firegrants/safer/index.shtm
Description: The purpose of SAFER grants is to help fire departments increase the number of frontline firefighters. The goal is for fire departments to increase their staffing and deployment capabilities and ultimately attain 24-hour staffing, thus ensuring that their communities have adequate protection from fire and fire-related hazards. The SAFER grants support two specific activities: (1) hiring of firefighters and (2) recruitment and retention of volunteer firefighters. The hiring of firefighters activity provides grants to pay for part of the salaries of newly hired firefighters over the five-year program. SAFER is part of the Assistance to Firefighters Grants and is under the purview of the Office of Grants and Training of the DHS.

Source: The Fire Prevention and Safety Grants (FP&S)
Agency: DHS
Website: http://www.fema.gov/firegrants/fpsgrants/index.shtm
Description: The FP&S are part of the Assistance to Firefighters Grants and are under the purview of the Office of Grants and Training in the DHS. FP&S offers support to projects that enhance the safety of the public and firefighters who may be exposed to fire and related hazards. The primary goal is to target high risk populations and mitigate high incidences of death and injury. Examples of the types of projects supported by FP&S include fire-prevention and public-safety education campaigns, juvenile fire-setter interventions, media campaigns, and arson prevention and awareness programs. In fiscal year 2005, Congress reauthorized funding for FP&S and expanded the eligible uses of funds to include firefighter safety research and development.

Source: Department of Interior- Community Assistance Grants
Agency: BLM and NPS
Description: Community Assistance is a program administered by the Department of Interior (BLM and NPS). The goal is to reduce wildland fire threats and losses to communities and natural resources by taking action before a fire starts. The program includes financial and technical assistance to help communities implement hazardous fuels reduction projects and initiate fire prevention measures. A grant program is available to Mesa County governments, fire departments, home owners associations and other groups. Community Assistance emphasizes collaboration between land owners and agencies working to reduce fuels in the Wildland Urban Interface. Information on this program is available from the Upper Colorado River Fire Management Unit.

I. Wildfire Mitigation Grants Administered Through CSFS:

Several opportunities currently exist for obtaining grant money to perform wildfire hazard mitigation in the Wildland Urban Interface. Some of these grant programs are summarized below. In addition, various grant programs are available through the NRCS and Colorado Division of Parks and Wildlife, which may apply to fuel reduction activities as well.

1. CSFS Grand Junction District WUI Incentives Program

These grants are administered through the Grand Junction District of the Colorado State Forest Service (CSFS). The program provides a 50% cost-share (reimbursement) to participating landowners who implement a variety of fuel reduction practices on their property, up to certain dollar limits per practice. Homeowners can elect to have work completed by a contractor, or can apply an hourly rate of $20.25 for their own time in completing the work. Eligible practices include: creation of defensible space around homes, thinning, pruning, creation of fuel breaks, interface broadcast burns, and slash disposal by either piling/burning, chipping, or hauling. Landowners may apply for these funds as a group through their homeowner's association, or as individual homeowners. Applications are taken year-round from the Grand Junction District CSFS office. These grants are generally applicable to projects with a total cost of less than $10,000.

2. Colorado Wildland Urban Interface (SFA) Grants

These grant dollars come from the U.S.D.A. Forest Service's State Fire Assistance (SFA) grant program. The grants are administered by the CSFS. The grants are designed to assist communities, homeowner associations, fire districts, and counties. SFA grants are awarded through a competitive process with emphasis on hazard fuel reduction, information and education activities, and community and homeowner action. The grants require a 50% cash match. Applications are typically submitted in September through local CSFS district offices, and grant awards are made the following year. These grants are generally applicable to projects with a total cost between $10,000 and $100,000.

3. Community Forest Restoration Grant Program

This grant program was established by the 2007 Colorado General Assembly and has been continued through the passage of legislation in 2008 and 2012. These grants will be administered through local CSFS district offices; grant applications are typically submitted in March and are awarded in June. Landowners and others with the legal authority to contract for work on properties where projects are being proposed may apply for a grant. All projects must be associated with a completed Community Wildfire Protection Plan that has been approved by CSFS. Additional consideration will be given to projects that involve an accredited Colorado Youth Corps, and projects that protect municipal watersheds will be given priority. The state share of total project cost may not exceed 60 percent per project. Grant recipients will be required to match up to 40 percent of the total project cost through cash, in-kind contributions, or federal funds. These grants typically fund larger-scale projects of $10,000 to $100,000.

APPENDIX G
HOMEOWNERS GUIDE

MESA COUNTY CWPP HOMEOWNERS GUIDE

This guide has been developed to address site-specific information on wildfire for Mesa County. In public meetings and written comments, residents expressed a need for better information on reducing wildfire risk and what to do in the event of a wildfire. This document was developed to meet these expressed community needs, as well as to fulfill requirements for the Community Wildfire Protection Plan. This guide 1) suggests specific measures that can be taken by homeowners to reduce structure ignitability and 2) enhances overall preparedness in the planning area by consolidating preparedness information from several local agencies and departments.

BEFORE THE FIRE—PROTECTION AND PREVENTION

REDUCING STRUCTURE IGNITABILITY

Structural Materials

Roofing—The more fire-resistant the roofing material, the better. The roof is the portion of the house that is most vulnerable to ignition by falling embers, known as firebrands. Metal roofs afford the best protection against ignition from falling embers. Slate or tile roofs are also non-combustible, and Class-A asphalt shingles are recommended as well. The most dangerous type of roofing material is wood shingles. Removing debris from roof gutters and downspouts at least twice a year will help to prevent fire, along with keeping them functioning properly.

Siding—Non-combustible materials are ideal for the home exterior. Preferred materials include stucco, cement, block, brick, and masonry.

Windows—Double-pane windows are most resistant to heat and flames. Smaller windows tend to hold up better within their frames than larger windows. Tempered glass is best, particularly for skylights, because it will not melt as plastic will.

Fencing and trellises—Any structure attached to the house should be considered part of the house. A wood fence or trellis can carry fire to your home siding or roof. Consider using nonflammable materials or use a protective barrier such as metal or masonry between the fence and the house.

If you are designing a new home or remodeling your existing one, do it with fire safety as a primary concern. Use nonflammable or fire resistant materials and have the exterior wood treated with UL-approved fire-retardant chemicals. More information on fire-resistant construction can be found at http://www.firewise.org.

SCREEN OFF THE AREA BENEATH DECKS AND PORCHES

The area below an aboveground deck or porch can become a trap for burning embers or debris, increasing the chances of the fire transferring to your home. Screen off the area using screening with openings no larger than one-half inch. Keep the area behind the screen free of all leaves and debris.

FIREWOOD, KINDLING, AND OTHER FLAMMABLES

Although convenient, stacked firewood on or below a wooden deck adds fuel that can feed a fire close to your home. Be sure to move all wood away from the home during fire season. Stack all firewood uphill, at least 30 feet and preferably 100 feet from your home.

When storing flammable materials such as paint, solvents, or gasoline, always store them in approved safety containers away from any sources of ignition such as hot water tanks or furnaces. The fumes from highly volatile liquids can travel a great distance after they turn into a gas. If possible, store the containers in a safe, separate location away from the main house.

CHIMNEYS AND FIREPLACE FLUES

Inspect your chimney and damper at least twice a year and have the chimney cleaned every year before first use. Have the spark arrestor inspected and confirm that it meets the latest safety code. Your local fire department will have the latest edition of National Fire Prevention Code 211 covering spark arrestors. Make sure to clear away dead limbs from within 15 feet of chimneys and stovepipes

FIREPLACE AND WOODSTOVE ASHES

Never take ashes from the fireplace and put them into the garbage or dump them on the ground. Even in winter, one hot ember can quickly start a grass fire. Instead, place ashes in a metal container, and as an extra precaution, soak them with water. Cover the container with its metal cover and place it in a safe location for a couple of days. Then either dispose of the cold ash with other garbage or bury the ash residue in the earth and cover it with at least 6 inches of mineral soil.

PROPANE TANKS

Your propane tank has many hundreds of gallons of highly flammable liquid that could become an explosive incendiary source in the event of a fire. The propane tank should be located at least 30 feet from any structure. Keep all flammables at least 10 feet from your tank. Learn how to turn the tank off and on. In the event of a fire, you should turn the gas off at the tank before evacuating, if safety and time allow.

SMOKE ALARMS

A functioning smoke alarm can help warn you of a fire in or around your home. Install smoke alarms on every level of your residence. Test and clean smoke alarms once a month and replace batteries at least once a year. Replace smoke alarms once every 10 years.

FIRE-SAFE BEHAVIOR

- If you smoke, always use an ashtray in your car and at home.
- Store and use flammable liquids properly.
- Keep doors and windows clear as escape routes in each room.

DEFENSIBLE SPACE

The removal of dense, flammable foliage from the area immediately surrounding the house reduces the risk of structure ignition and allows firefighters access to protect the home. A 100-foot safety zone, free of all trees and shrubs, is recommended by the fire department; the minimum distance is 30 feet. Steep slopes require increased defensible space because fire can travel quickly uphill.

Within the minimum 30-foot safety zone, plants should be limited to fire-resistant trees and shrubs. Focus on fuel breaks such as concrete patios, walkways, rock gardens, and irrigated garden or grass areas within this zone. Use mulch sparingly within the safety zone, and focus use in areas that will be watered regularly. In areas such as turnarounds and driveways, nonflammable materials such as gravel are much better than wood chips or pine needles.

Vegetative debris such as dead grasses or leaves provide important erosion protection for soil but also may carry a surface fire. It is simply not feasible to remove all the vegetative debris from around your property. However, it is a good idea to remove any accumulations within the safety zone and extending out as far as possible. This is particularly important if leaves tend to build up alongside your house or outbuildings. Removing dead vegetation and leaves and exposing bare mineral soil are recommended in a 2-foot-wide perimeter along the foundation of the house. Also, be sure to regularly remove all dead vegetative matter including grasses, flowers, and leaf litter surrounding your home and any debris from gutters, especially during summer months. Mow the lawn regularly and promptly dispose of the cuttings properly. If possible, maintain a green lawn for 30 feet around your home.

All trees within the safety zone should have lower limbs removed to a height of 6–10 feet. Remove any branches within 15 feet of your chimney or overhanging any part of your roof. Ladder fuels are short shrubs or trees growing under the eaves of the house or under larger trees. Ladder fuels carry fire from the ground level onto the house or into the tree canopy. Be sure to remove all ladder fuels within the safety zone first. The removal of ladder fuels within about 100 feet of the house will help to limit the risk of crown fire around your home. More information about defensible space is provided at http://www.firewise.org.

FIRE RETARDANTS

For homeowners who would like home protection beyond defensible space and fire-resistant structural materials, fire-retardant gels and foams are available. These materials are sold with

various types of equipment for applying the material to the home. They are similar to the substances applied by firefighters in advance of wildfire to prevent ignition of homes. Different products have different timelines for application and effectiveness. The amount of product needed is based on the size of the home, and prices may vary based on the application tools. Prices range from a few hundred to a few thousand dollars. An online search for "fire blocking gel" or "home firefighting" will provide a list of product vendors.

ADDRESS POSTING

Locating individual homes is one of the most difficult tasks facing emergency responders. Every home should have the address clearly posted with numbers at least three inches high. The colors of the address posting should be contrasting or reflective. The address should be posted so that it is visible to cars approaching from either direction.

ACCESS

Unfortunately, limited access may prevent firefighters from reaching many homes in Mesa County. Many of the access problems occur at the property line and can be improved by homeowners. First, make sure that emergency responders can get in your gate. This may be important not only during a fire but also to allow access during any other type of emergency response. If you will be gone for long periods during fire season, make sure a neighbor has access, and ask them to leave your gate open in the event of a wildfire in the area.

Ideally, gates should swing inward. A chain or padlock can be easily cut with large bolt cutters, but large automatic gates can prevent entry. Special emergency access red boxes with keys are sold by many gate companies but are actually not recommended by emergency services. The keys are difficult to keep track of and may not be available to the specific personnel that arrive at your home. An alternative offered by some manufacturers is a device that opens the gate in response to sirens. This option is preferred by firefighters but may be difficult or expensive to obtain.

Beyond your gate, make sure your driveway is uncluttered and at least 12 feet wide. The slope should be less than 10%. Trim any overhanging branches to allow at least 13.5 feet of overhead clearance. Also make sure that any overhead lines are at least 14 feet above the ground. If any lines are hanging too low, contact the appropriate phone, cable, or power company to find out how to address the situation.

If possible, consider a turnaround within your property at least 45 feet wide. This is especially important if your driveway is more than 300 feet in length. Even small fire engines have a hard time turning around and cannot safely enter areas where the only means of escape is by backing out. Any bridges must be designed with the capacity to hold the weight of a fire engine.

NEIGHBORHOOD COMMUNICATION

It is important to talk to your neighbors about the possibility of wildfire in your community. Assume that you will not be able to return home when a fire breaks out and may have to rely on your neighbors for information and assistance. Unfortunately, it sometimes takes tragedy to get

people talking to each other. Don't wait for disaster to strike. Strong communication can improve the response and safety of every member of the community.

PHONE TREES

Many neighborhoods use phone trees to keep each other informed of emergencies within and around the community. The primary criticism is that the failure to reach one person high on the tree can cause a breakdown of the system. However, if you have willing and able neighbors, particularly those that are at home during the day, the creation of a well-planned phone tree can often alert residents to the occurrence of a wildfire more quickly than media channels. Talk to your neighborhood association about the possibility of designing an effective phone tree.

NEIGHBORS IN NEED OF ASSISTANCE

Ask mobility-impaired neighbors if they have notified emergency responders of their specific needs. It is also a good idea for willing neighbors to commit to evacuating a mobility-impaired resident in the event of an emergency. Make sure that a line of communication is in place to verify the evacuation.

ABSENTEE OWNERS

Absentee owners are often not in communication with their neighbors. If a home near you is unoccupied for large portions of the year, try to get contact information for the owners from other neighbors or your neighborhood association. Your neighbors would probably appreciate notification in the event of an emergency. Also, you may want to contact them to suggest that they move their woodpile or make sure that the propane line to the house is turned off.

HOUSEHOLD EMERGENCY PLAN

A household emergency plan does not take much time to develop and will be invaluable in helping your family deal with an emergency safely and calmly. One of the fundamental issues in the event of any type of emergency is communication. Be sure to keep the phone numbers of neighbors with you rather than at home.

It is a good idea to have an out of state contact, such as a family member. When disaster strikes locally, it is often easier to make outgoing calls to a different area code than local calls. Make sure everyone in the family has the contact phone number and understands why they need to check in with that person in the event of an emergency. Also, designate a meeting place for your family. Having an established meeting site helps to ensure that family members know where to go, even if they can't communicate by phone.

CHILDREN

Local schools have policies for evacuation of students during school hours. Contact the school to get information on how the process would take place and where the children would likely go.

The time between when the children arrive home from school and when you return home from work is the most important timeframe that you must address. Fire officials must clear residential areas of occupants to protect lives and to allow access for fire engines and water drops from

airplanes or helicopters. If your area is evacuated, blockades may prevent you from returning home to collect your children. It is crucial to have a plan with a neighbor for them to pick up your children if evacuation is necessary.

PETS AND LIVESTOCK

Some basic questions about pets and livestock involve whether you have the ability to evacuate the animals yourself and where you would take them. Planning for the worst-case scenario may save your animals. An estimated 90% of pets left behind in an emergency do not survive. Don't expect emergency service personnel to prioritize your pets in an emergency. Put plans in place to protect your furry family members.

PETS

Assemble a pet disaster supply kit and keep it handy. The kit should contain a three-day supply of food and water, bowls, a litter box for cats, and a manual can opener if necessary. It is also important to have extra medication and medical records for each pet. The kit should contain a leash for each dog and a carrier for each cat. Carriers of some kind should be ready for birds and exotic pets. In case your pet must be left at a kennel or with a friend, also include an information packet that describes medical conditions, feeding instructions, and behavioral problems. A photo of each pet will help to put the right instructions with the right pet.

In the event of a wildfire you may be prevented from returning home for your animals. Talk to your neighbors and develop a buddy system in case you or your neighbors are not home when fire threatens. Make sure your neighbor has a key and understands what to do with your pets should they need to be evacuated.

If you and your pets were evacuated, where would you go? Contact friends and family in advance to ask whether they would be willing to care for your pets. Contact hotels and motels in the area to find out which ones accept pets. Boarding kennels may also be an option. Make sure your pets' vaccinations are up-to-date if you plan to board them.

Once you have evacuated your pets, continue to provide for their safety by keeping them cool and hydrated. Try to get your pets to an indoor location rather than leaving them in the car. Do not leave your pets in your vehicle without providing shade and water. It is not necessary to give your pets water while you are driving, but be sure to offer water as soon as you reach your destination.

LIVESTOCK

Getting livestock out of harm's way during a wildfire is not easy. You may not be able or allowed to return home to rescue your stock during a wildfire evacuation. Talk to your neighbors about how you intend to deal with an evacuation. If livestock are encountered by emergency responders, they will be released and allowed to escape the fire on their own. Make sure your livestock have some sort of identification. Ideally, your contact information should be included on a halter tag or ear tag so that you could be reached if your animal is encountered.

If you plan to evacuate your livestock, have a plan in place for a destination. Talk to other livestock owners in the area to find out whether they would be willing to board your stock in the event of an emergency. Often in large-scale emergencies, special accommodations can be made at fair and rodeo grounds, but personal arrangements may allow you to respond more quickly and efficiently.

If you do not own a trailer for your horses or other livestock, talk to a neighbor who does. Find out whether they would be willing to assist in the evacuation of your animals. If you do own a trailer, make sure it is in working condition with good, inflated tires and functioning signal lights. Keep in mind that even horses that are accustomed to a trailer may be difficult to load during an emergency. Practicing may be a good idea to make sure your animals are as comfortable as possible when being loaded into the trailer.

HOUSE AND PROPERTY

Insurance companies suggest that you make a video that scans each room of your house to help document and recall all items within your home. This video can make replacement of your property much easier in the unfortunate event of a large insurance claim. See more information on insurance claims in the "After the Fire" section below.

PERSONAL ITEMS

During fire season, items you would want to take with you during an evacuation should be kept in one readily accessible location. As an extra precaution, it may be a good idea to store irreplaceable mementos or heirlooms away from your home during fire season.

It is important to make copies of all important paperwork, such as birth certificates, titles, and so forth, and store them somewhere away from your home, such as in a safe deposit box. Important documents can also be protected in a designated firesafe storage box within your home.

IN THE EVENT OF A FIRE

NOTIFICATION

In the event of a wildfire, announcements from the local Emergency Management office will be broadcast over local radio and television stations. Media notification may be in the form of news reports or the Emergency Alert System (EAS). On television, the emergency management message will scroll across the top of the screen on local channels. The notice is not broadcast on non-local satellite and cable channels.

One good way to stay informed about wildfire is to use a National Oceanic and Atmospheric Administration weather alert radio. The radios can be purchased at most stores that carry small appliances, such as Target, Sears, or Radio Shack. The radio comes with instructions for the required programming to tune the radio to your local frequency. The programming also determines the types of events for which you want to be alerted. The weather alert radio can be used for any type of large incident (weather, wildfire, hazardous materials, etc.), depending on how it is programmed. Local fire personnel can assist with programming if needed.

WHEN FIRE THREATENS

Before an evacuation order is given for your community, there are several steps you can take to make your escape easier and to provide for protection of your home. When evaluating what to do as fire threatens, the most important guideline is: DO NOT JEOPARDIZE YOUR LIFE.

Back your car into the garage or park it in an open space facing the direction of escape. Shut the car doors and roll up the windows. Place all valuables that you want to take with you in the vehicle. Leave the keys in the ignition or in another easily accessible location. Open your gate.

Close all windows, doors, and vents, including your garage door. Disconnect automatic garage openers and leave exterior doors unlocked. Close all interior doors as well.

Move furniture away from windows and sliding glass doors. If you have lightweight curtains, remove them. Heavy curtains, drapes, and blinds should be closed. Leave a light on in each room.

Turn off the propane tank or shut off gas at the meter. Turn off pilot lights on appliances and furnaces.

Move firewood and flammable patio furniture away from the house or into the garage.

Connect garden hoses to all available outdoor faucets and make sure they are in a conspicuous place. Turn the water on to "charge," or fill your hoses and then shut off the water. Place a ladder up against the side of the home, opposite the direction of the approaching fire, to allow firefighters easy access to your roof.

EVACUATION

When evacuation is ordered, you need to go ***immediately***. Evacuation not only protects lives, it also helps to protect property. Some roads in Mesa County are too narrow for two-way traffic, especially with fire engines. Fire trucks often can't get into an area until the residents are out. Also, arguably the most important tool in the WUI toolbox is aerial attack. Airplanes and helicopters can be used to drop water or retardant to help limit the spread of the fire, but these resources cannot be used until the area has been cleared of civilians.

Expect emergency managers to designate a check-out location for evacuees. This process helps to ensure that everyone is accounted for and informs emergency personnel as to who may be remaining in the community. Every resident should check out at the designated location before proceeding to any established family meeting spot.

A light-colored sheet closed in the front door serves as a signal to emergency responders that your family has safely left. This signal saves firefighters precious time, as it takes 12–15 minutes per house to knock on each door and inform residents of the evacuation.

AFTER THE FIRE

RETURNING HOME

First and foremost, follow the advice and recommendations of emergency management agencies, fire departments, utility companies, and local aid organizations regarding activities following the wildfire. Do not attempt to return to your home until fire personnel have deemed it safe to do so.

Even if the fire did not damage your house, do not expect to return to business as usual immediately. Expect that utility infrastructure may have been damaged and repairs may be necessary. When you return to your home, check for hazards, such as gas or water leaks and electrical shorts. Turn off damaged utilities if you did not do so previously. Have the fire department or utility companies turn the utilities back on once the area is secured.

INSURANCE CLAIMS

Your insurance agent is your best source of information as to the actions you must take in order to submit a claim. Here are some things to keep in mind. Your insurance claim process will be much easier if you photographed your home and valuable possessions before the fire and kept the photographs in a safe place away from your home. Most if not all of the expenses incurred during the time you are forced to live outside your home could be reimbursable. These could include, for instance, mileage driven, lodging, and meals. Keep all records and receipts. Don't start any repairs or rebuilding without the approval of your claims adjuster. Beware of predatory contractors looking to take advantage of anxious homeowners wanting to rebuild as quickly as possible. Consider all contracts very carefully, take your time to decide, and contact your insurance agent with any questions.

POST-FIRE REHABILITATION

Homes that may have been saved in the fire may still be at risk from flooding and debris flows. Burned Area Emergency Rehabilitation (BAER) teams are inter-disciplinary teams of professionals who work to mitigate the effects of post-fire flooding and erosion. These teams often work with limited budgets and manpower. Homeowners can assist the process by implementing treatments on their own properties as well as volunteering on burned public lands to help reduce the threat to valuable resources. Volunteers can assist BAER team members by planting seeds or trees, hand mulching, or helping to construct straw-bale check dams in small drainages.

Volunteers can help protect roads and culverts by conducting storm patrols during storm events. These efforts dramatically reduce the costs of such work as installing trash racks, removing culverts, and re-routing roads.

Community volunteers can also help scientists to better understand the dynamics of the burned area by monitoring rain gauges and monitoring the efficacy of the installed BAER treatments.