

COMMUNITY FIRE PLAN

Moffat County, Colorado

Community Fire Mitigation Plans:

Knez Divide
Bakers Peak
WildernessRanch
Greystone

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FINAL — DECEMBER 28, 2004

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Community Fire Planning in Moffat County, Colorado

Introduction

In 2003, Moffat County, Colorado completed the last phase of a county-wide wildland fire planning effort. This report builds onto the Moffat County Wildland Fire and Fuel Management Plan by including more detailed community wildland fire mitigation plans for four communities identified at greatest risk from wildfire in Moffat County including Greystone, Wilderness Ranch, Bakers Peak and Knez Divide.

Funding for Community Fire Planning

This project is a joint effort by many "partners". The Bureau of Land Management supported this planning effort by providing almost ninety percent of the funding and numerous hours of expertise. The result is a compilation of all new (i.e., digital imagery) and existing data bases and reports into one strategic document that addresses the issues of fire protection, fire suppression, fuels reduction and emergency communications for the communities of Greystone, Knez Divide, Bakers Peak and Wilderness Ranch. It covers all land ownerships, private and public, within the wildland urban interface of each community.

Background and History of Fire Management in Moffat County

The landscape in Moffat County shows evidence of wildland fire impacts throughout history. Beginning in the early to mid twentieth century, wildland fires were viewed as having negative impacts on the natural environment, thus, suppressing them became policy. In recent history, stemming from a revision of State policy in 2000 with HR Bill 00-1283 along with the eye-opening fire season that same year, public awareness of the benefits of fire to the ecosystem and the potential for catastrophic wildland fires, a result of long periods of fire suppression that promoted the buildup of fuels coupled with more homes being built in fire-prone environments, has increased. Since then, significant efforts have been made in Moffat County toward reducing the potential for loss of life, property, and natural resources. This was mainly done by viewing fire as a natural and inevitable part of the environment and planning across all land ownership boundaries with that in mind. The goal is to reduce the amount of funds needed for firefighting in the future by turning planning into action and avoiding the loss of lives, homes and property from wildfires.

History of Fire Occurrences and Community Impacts

Fire management officers are often heard saying it is not 'if' but 'when' a wildland fire will threaten a community in Moffat County because it experiences more lightning strikes than most places in North America. Historically, fires burned through the vast open spaces resulting in few

impacts to humans. Recently, human habitation has been expanding, resulting in an increase of wildland urban interface in Moffat County. As a result, much more infrastructure exists in several fire-prone areas, inhibiting the ability of wildland fire managers to effectively manage fires across the landscape. Phases I through III of the Moffat County Wildland Fire and Fuel Management Plan (2001-2003) identified the developments that have been built in historically fire-prone areas as “communities at risk” and assigned these communities with fire hazard ratings. The four communities that were identified in the highest risk categories included Greystone, Bakers Peak, Wilderness Ranch and Knez Divide.

Activities for Community Fire Management

Previous wildland fire management planning efforts involved: Bureau of Land Management (BLM), National Park Service, Medicine Bow/Routt and White River National Forest Service, Moffat County Sheriff’s Department, Fish and Wildlife Service, Colorado State Forest Service, Colorado State Land Board, Colorado Division of Wildlife, Moffat County Natural Resources Department, Moffat County Commissioners, local fire departments and private landowners.

The community wildfire mitigation plans included in this report continue to build from previous work, involving all stakeholders, and resulting in plans that can be directly used by federal, state, and private partners to implement on-the-ground projects for wildfire mitigation and community protection.

Planning Area Boundaries

Planning area boundaries for Greystone, Wilderness Ranch, Bakers Peak and Knez Divide were originally defined in the Moffat County Wildland Fire and Fuel Management Plan and were further defined through a detailed analysis of the wildland urban interface (WUI) through a digital imagery process using satellite photos. Knez Divide is the only community that is located in a fire district. The three remaining communities are under the protection of the Moffat County Sheriff’s Department.

Planning Process

Description of Partners

Several government agencies (BLM, National Forest Service, State Forest Service) and local fire departments (Craig Volunteer Fire Department and Maybell Fire Department) participated in the County’s planning process by attending community meetings and providing technical advice and expertise.

Collaboration and Community Input Process

A project “kick-off” meeting was held on July 8, 2004 at the Moffat County Courthouse to gather input on the information gathering process from the Bureau of Land Management, National Forest Service, Colorado State Forest Service, Moffat County Sheriff’s Department and local fire departments. In order to assure community wildfire mitigation plans included specific recommendations that federal state, and private landowners could implement, field tours were

made to gather input from landowners and residents in the four communities at risk. Many site visits were conducted to discuss fuel treatment options available to landowners and communities.

*Description of Community Outreach and Meetings**

Community meetings were coordinated with the Sheriff's Department, volunteer fire departments, BLM, National Forest Service and other agencies and private organizations involved in fire management or fuel reduction.

The Greystone community meeting was held on Thursday, July 29, 2004 at 7:00 pm at the Maybell Community Center to discuss where and how to conduct fuel treatment projects to protect the homes in Greystone. Community residents also discussed their concerns about possible emergencies that may occur in the area and what kind of equipment and training is needed.

A meeting with the Moffat County Commissioners, Sheriff's Department, Craig Fire Department, State Forest Service, Bureau of Land Management, and the National Forest Service to discuss planning for Bakers Peak and Wilderness Ranch was held on Tuesday, August 17, 2004 at 11:00 am at the Moffat County Courthouse.

ResourceLogic, LLC, met with several Bakers Peak Landowner Association board members and landowners in the community on September 5, 2004. Issues discussed included explanation of the planning effort, access issues, and information needed from landowners.

ResourceLogic, LLC, and a representative from the USFS attended the Wilderness Ranch Board of Directors meeting on October 9, 2004 at 6:00 pm at the Holiday Inn in Craig to discuss the project and request input and information from landowners. The USFS planning effort for fuel reduction and beetle infestation mitigation on adjacent public land was also discussed. Because many of the Wilderness Ranch and Bakers Peak landowners are absentee, the contractors mailed more than 760 letters describing the project and asking for input from landowners.

The Knez Divide community meeting was held on Wednesday, October 13, 2004 at 7:00 pm at the Shadow Mountain Clubhouse.

A meeting was held with the Moffat County Commissioners, Sheriff's Department, CRFPD, state and federal agencies on December 8, 2004 at 2:00 pm at the courthouse conference room to review draft community fire mitigation plans for Bakers Peak, Wilderness Ranch, Knez Divide, and Greystone.

1.0 Introduction Moffat County Community Fire Mitigation Plans

A meeting was held on December 11, 2004 at 11:00 am at the Center of Craig for landowners in the Bakers Peak and Wilderness Ranch communities to get input on the rough draft of the plans.

A meeting was held on December 13, 2004 at 6:00 pm at the Shadow Mountain Clubhouse for landowners in the Knez Divide community to get input on the rough draft of the plan.

A meeting was held on December 14, 2004 at 6:00 pm at the Maybell Community Center for landowners in the Greystone community to get input on the rough draft of the plan.

*Documentation of community outreach/meetings is included in the Appendix A of this report.

KNEZ DIVIDE Community Fire Mitigation Plan

Community Profile

The Knez Divide community is located approximately two miles south of Craig, Colorado with access from State Highway 394. The community encompasses an area of approximately eleven square miles or 7,040 acres. The community includes four suburban subdivisions that were developed for primary residences. There are 117 property parcels with 74 individual landowners. There are 259 structures in the community, which include homes, barns, and other outbuildings. The property parcels have a wide range of size from 10-900 acres. Residences and agriculture are the primary land uses. Land ownership is approximately 89 percent for the local area and 11 percent absentee ownership from other states. Most owners are permanent full time residents. The community does not have a landowners association. There is an association of landowners on MCR 206 (Southview & Breeze Highlands Water Company) that shares water from a community well and storage system.

Values

Most of the landowners in Knez Divide own property for a permanent residence or for agricultural or recreational/hunting purposes. They value the area for its close proximity to Craig while maintaining a rural and spacious atmosphere. The aesthetic values (i.e., views and vegetation that serves the dual purpose of privacy and beauty) are very important.

Wildfire Risk Assessment

Fire History

There is no evidence of any significant wildfire activity in the community in the past 50 years or more. High risk fuels such as oak/mountain shrub intermixed with medium risk sagebrush continue to move toward old age-class stands and represent an ever-increasing fire danger.

Fire Hazard

Vegetation is a mosaic of grass, sagebrush, Gambels oak, mountain shrub, dryland pastures, and irrigated meadows. The northern half of the community and most of MCR 35 is at low risk for fire due to lower density of hazardous fuels and many open areas and fields or meadows. The southern half of the community including homes along MCR 206 and MCR 33 are at higher risk from wildfire. Information including vegetation, elevation, slope, aspect, satellite imagery, and field verification has been used to determine locations of high-risk fuels in the community. Based on this information, ten *zones of concern* have been identified. Criteria for selecting the zones include high-risk fuels, clusters of homes in close proximity, or a combination of the first two criteria. The *zones of concern* are shown on Figure 2.2. Following is a list of the designated zones with associated acreages and structure information.

Table 1 – Knez Divide Zones of Concern

Class	Zone Number	Perimeter (M)	Area (M)	Acres	Number of Structures	Acres per Structure	Threat*
Zone of Concern	21	8561.0	1490995.0	34.2	17	2.0	Fuels/DS
Zone of Concern	22	5648.5	1527214.1	35.1	9	3.9	DS
Zone of Concern	23	3409.0	764399.2	17.5	11	1.6	DS
Zone of Concern	24	9642.4	1848816.3	42.4	16	2.7	Fuels/DS
Zone of Concern	25	12976.6	10068687.2	231.1	68	3.4	Fuels/DS
Zone of Concern	26	7347.4	1923635.5	44.2	15	2.9	DS
Zone of Concern	27	2320.6	312974.1	7.2	9	0.8	DS
Zone of Concern	28	4690.5	1386070.7	31.9	12	2.7	DS
Zone of Concern	29	5735.9	1790251.9	41.1	17	2.4	DS
Zone of Concern	30	4077.7	684186.0	15.7	8	2.0	DS

Table headings are explained as follows: Zone of Concern and Zone numbers labeled in Figure 2.3; Perimeter in meters; Area in meters; Acres in each zone; Number of structures in the zone; mean Acres per Structure in the zone; and Threat * which is the reason(s) for selecting the zones due to high risk fuels (Fuels), Density of Structures in each zone (DS), or a combination (Fuels/DS).

Wildland Urban Interface (WUI)

Knez Divide is a rural community that includes both residential development and agriculture. The community boundary designated in the plan is assumed to be the WUI. There are several types of Wildland Urban Interface (WUI) communities in Moffat County. These include interface communities, intermix communities, occluded interface and rural interface (see glossary for definitions). Knez Divide can be defined as an ‘intermix community’ where structures are scattered throughout the wildland area and wildland fuels are continuous outside of and within the developed area.

Protection Capabilities and Infrastructure

Water sources

Reliable water sources are very limited within the community. There are several reservoirs and ponds that held water in the past, but due to current drought conditions these sources are not reliable for fire use and have not been mapped. There is a well and 12,000 gallon storage tank located on MCR 206. The system is located immediately adjacent to the road and is accessible for filling trucks or water tenders. There is also an excellent well and 10,000 gallon storage system located at the Moffat County Airport. This system is used annually during the fire season for fire suppression. The Yampa River is nearby and could be used for a helicopter dip site. Figure 2.3 shows the well/storage sites.

Staging areas/Safety zones

There are several open areas on the north and west sides of the community that could serve as both staging areas and safety zones. These areas are shown on Figure 2.3.

Roads

The community is served by three County roads; MCR 33 on the east which is the only through road that connects SH 394 on the north and SH 317 on the south, commonly known as the Knez Divide road; MCR 35 on the west which is closed and gated at the community boundary; and MCR 206 that runs east and west and connects with MCR 35 on the west and MCR 33 on the

east. The main County roads (MCR 33 & 35) have sufficient widths, moderate grades, and are well maintained. MCR 206 is narrower, has steep grades, and lack of turnaround space that may cause problems for firefighters. MCR 206 does not have County road signs, but has been designated as Highland drive on the east and Meadow Lane on the west. These designations may cause confusion emergency responders (Figure 3 show both designations). Parcels along the main County roads are large enough for firefighters to defend individual structures. Parcels along MCR 206 are generally smaller, located along the ridge top, and driveways are narrower and steeper which may prevent firefighters from adequately defending individual structures. All County roads and driveway entrances are shown on Figure 2.2.

Utilities/Phone service

The Knez Divide community is located a few miles east of the Craig Power Plant and thus has several high voltage and service transmission lines that cross the community from west to east. There are also several buried gas pipelines that cross the community. A gas processing plant is located just east of the community boundary on the north end of MCR 33. Utilities are shown on Figure 2.2.

Bridges

There are no bridges within the community and, therefore, no weight restrictions exist.

Structure Analysis

Fire Risk Rating

Each structure within the community was delineated with a 100-ft. buffer and then assigned zero, positive, or negative values using the following criteria to develop a scoring system generally referred to as a “proximity assessment”. Each structure will be assigned a number and a cumulative score. This will provide the end user such as the Sheriff’s Department a comparative measurement that indicates the significance of risk that individual structures or groups of structures are exhibiting in the community. Maps and the complete rating system for every structure are based on an analysis of satellite imagery and will be provided in a separate report to Moffat County by Native Communities Development Corp. (NCDC).

Structure Fire-Risk Rating System (100-ft Buffer)

Timber	=	-1000	
Scrub	=	-500	
Safety Zone	=	500	
Power lines	=	-500	
Water Source	=	1000	
Sunlit*	=	-100	*Sunlit Aspect = increased dry fuels danger
Slope:			
0 – 10	=	0	
10 – 20	=	-250	
20 – 30	=	-500	
30 – 40	=	-1000	

Structure Ignitability

Structures were also analyzed, using satellite imagery, to identify the number of structures constructed with flammable roof materials (primarily shake shingle/wooden roofs). The Structural Ignitability analysis report will also be provided to Moffat County by NCDC.

Mitigation Action Plan

Fuel Reduction Recommendations

Fuel reduction in high-risk areas

In connection with the zones of concern designated as a part of the wildfire risk assessment described previously, five fuel reduction treatment projects are recommended. Two projects are recommended for areas where thick sagebrush provides a connection between intermittent but dense stands of oak/mountain shrub. These projects are designed to reduce the spread in the higher risk fuel. Three projects are recommended to protect three power line structures (315KV) on the south end of the community. Community fuel reduction projects are not recommended for most of the zones of concern. Many of the zones have a high density of homes and a low number of acres per structure, especially along MCR 206, which increases the risk to both individual and groups of landowners for wildfire and human caused fire. Landowners are encouraged to create or improve defensible space around homes as the best means of protecting against loss of property or lives from wildfire. Following is a list of recommended projects and associated acreages. Recommended treatment options/costs include hand thinning (\$300-\$800/ac.), mechanical thinning—hydro-ax or similar treatment (\$250-\$500/ac.), brush beating for treatment of sagebrush (\$20-\$70/ac.) or roller chopping brush and small trees (\$60-\$120/ac.).

Table 2 – Knez Divide Mitigation Projects

COMMUNITY	Project Number	ZONE OF CONCERN	AREA (Ft.)	PERIMETER	HECTARES	MITIGATION ACRES
Knez Divide	25	Zone 21--West	109,773.9	2,125.2	1.02	2.5
Knez Divide	26	Zone 21--South	205,045.6	2,198.5	1.9	4.7
Knez Divide	27	Transmission Lines	178,349.6	1,497.0	1.7	4.1
Knez Divide	28	Transmission Lines	172,782.1	1,473.5	1.6	4.0
Knez Divide	29	Transmission Lines	157,039.8	1,405.0	1.5	3.6

Fuel Reduction Project Plans

Site specific recommendations and information for each fuel reduction project is included in Appendix F. The plans include a description and need for proposed actions, general treatment recommendations, discussion of watershed issues, discussion of wildlife habitat/species of concern issues, and identification of any constraints or unique circumstances associated with each proposed project.

Monitoring and Evaluation

To ensure the plan maintains its relevance and effectiveness over time, the objective is to monitor the effectiveness of fuel treatment projects, on both federally managed and privately owned lands in Moffat County, that are designed to reduce fire hazard by managing fuels. This will be done with the following procedures:

- 1) Establish photo points and plots in each of the two main fuel categories: timber or woodlands and brush stands.
- 2) Take before and after measurements. Photos should be taken in early summer and fall to document seasonal fuel conditions.
- 3) If prescribed fire is a treatment, use a weather/fuels/fire behavior form to record findings.
- 4) Establish plots and/or transects to monitor tree growth and survival, changes in canopy cover/species composition, and plant community response after burning.
- 5) A community-wide GIS overlay will provide an overall look at the effectiveness of reducing fuels buildup and fire hazard ratings.
- 6) Reporting will occur at 3-5 year intervals, through at least three treatment cycles.

Taken all together, these components will provide information to determine Moffat County's effectiveness in decreasing overall fire hazard ratings for four communities at risk.

Emergency Operations

Current Activities

Wildland suppression procedures

The Knez Divide community is within the boundaries of Craig Rural Fire Protection District and therefore the Craig Rural Fire Department has primary responsibility for responding to fire or other emergencies. The Moffat County Sheriff's Department will provide assistance if necessary. Response to the community from Craig is estimated at 20 minutes.

Structural

Driveway access locations and structures have been mapped and identified on Figure 2.3 and should significantly improve location of structures in an emergency.

Inventory of fire protection resources

A list of firefighting equipment available to the Craig Rural Fire Department and the Moffat County Sheriff's Department is shown in Appendix D.

Emergency contact information

A database of information for the community including landowners' names, addresses, and phone numbers is shown in Appendix I (Confidential).

Mutual aid agreements

An Annual Fire Operating Plan (AOP) has been developed in Moffat County for the purpose setting forth standard operating procedures, policies, and responsibilities for implementing cooperative wildfire protection on all lands within the county. Participants in the AOP include the Moffat County Sheriff, Moffat County Board of County Commissioners, USFS—Hahns Peak District, BLM—Craig Field Office, BLM—Meeker Field Office, NPS—Dinosaur National Monument, USFWS—Browns Park National Wildlife Refuge, and the Colorado State Forest Service. The AOP is contained in Appendix C.

Recommendations for Improving Emergency Preparedness

Driveway/Address information

It is recommended that all landowners provide addresses or landowner name information/signs at driveway entrances to assist emergency responders. Figure 2.2 shows landowner last names as identification for parcel ownership.

Access to structures

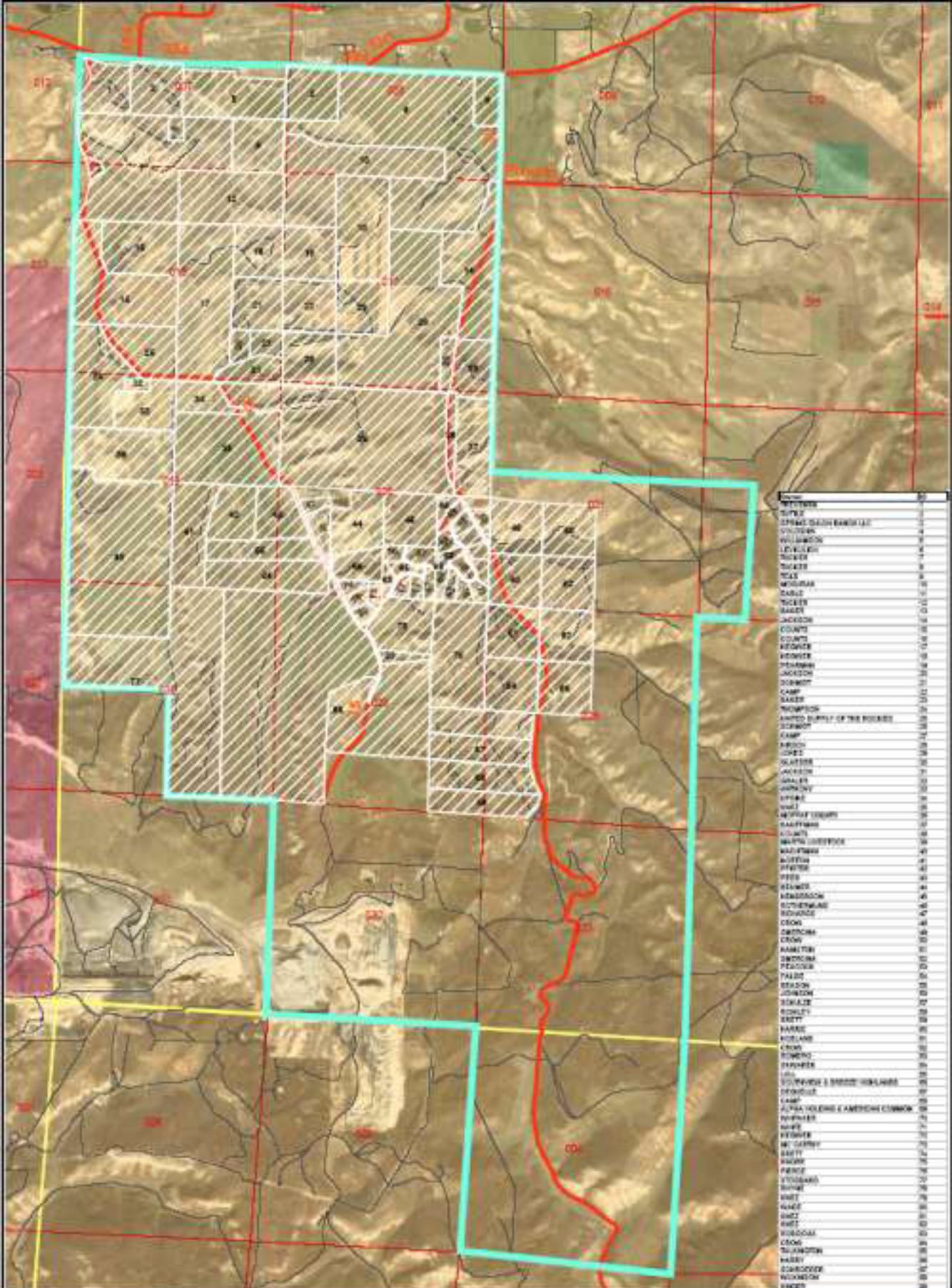
Several parcels in the community, especially along MCR roads 33 and 206 do not have adequate driveway widths, turnaround space, or defensible space around structures to provide safe access for firefighters. Appendix B provides information and recommendations for driveway specifications and defensible space around homes. Landowners are encouraged to utilize this information to reduce structural vulnerability and improve safety for both firefighters and homeowners.

Telephone tree

In addition to an emergency contact list that will be available at the Colorado State Patrol office in Craig, it is recommended that landowners develop an internal telephone tree system to improve contact or evacuation notification in an emergency.

Evacuation Plan

Moffat County should develop an evacuation plan for the community. Several elements identified in this plan, including ingress and egress to the community, roads within the community, individual driveways, and high risk fuel areas, will be essential in the development of an evacuation plan.



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33	BLM
34	BLM
35	BLM
36	BLM

Legend

- Parcels
- Community Boundary
- Township
- BLM
- Ingress/Egress
- Sections
- PRIVATE
- STATE
- Private/Minor Roads

Figure 2.1





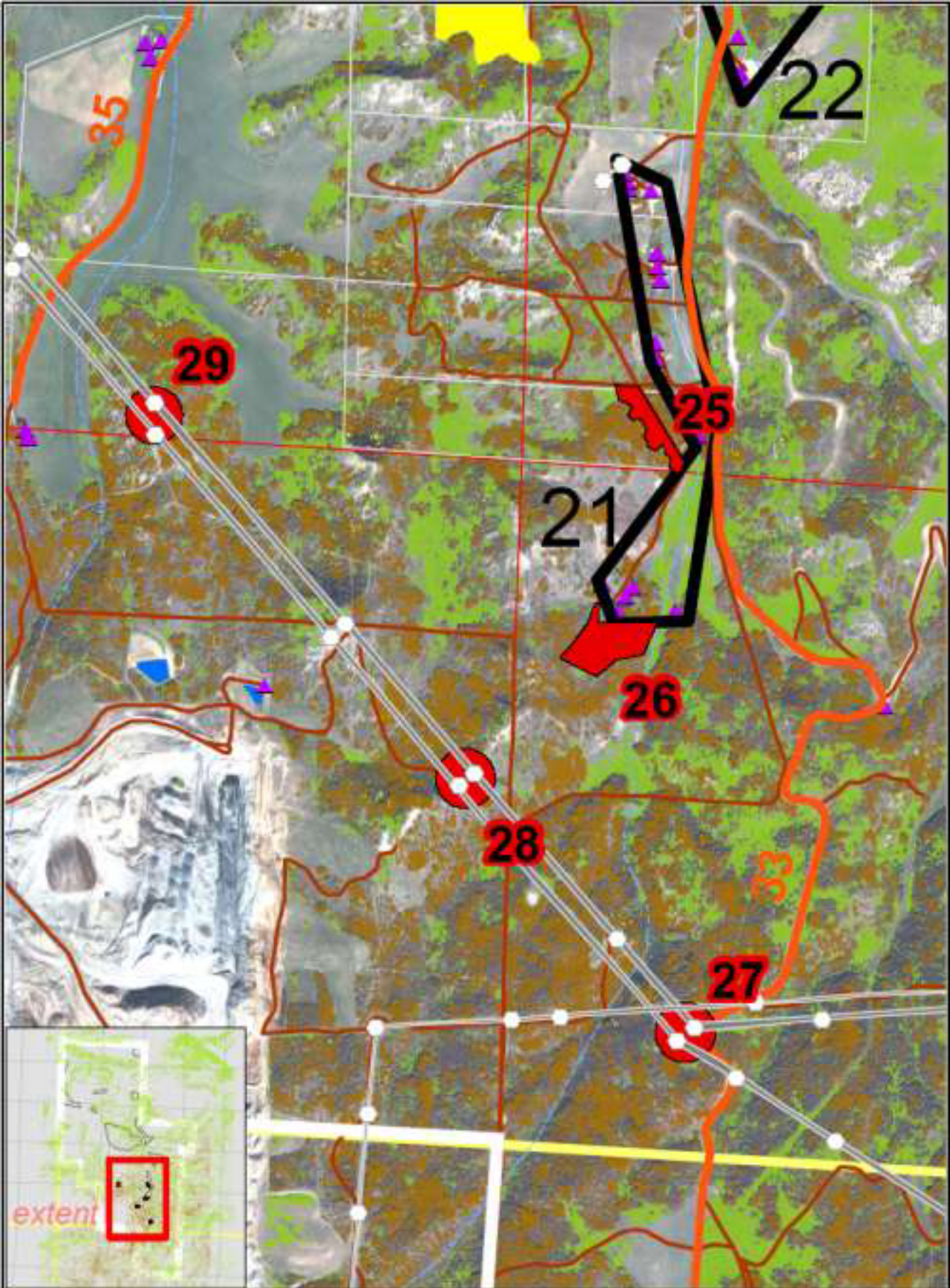
Data Sources: 2004 Aerial Imagery, N.M. 4x4 GPS, Malheur County Assessor's Data, and NEDC imagery-derived roadfiles.

Knez Divide Land Ownership & Cadastral Boundaries

Malheur County Fire Plan
ResourceMap, LLC 2004



Legend			Figure 2.2	Knez Divide Pre-Emergency Planning
Ingress/Egress	Storage/Well	Community Boundary		<p>Moffat County Fire Plan ResourceLogix, LLC 2004</p>
Private/Minor Roads	Structures	Township	 0 0.125 0.25 0.5 Miles	
Safety Zone	Gas Treatment Plant	Sections	<small> 2004 ResourceLogix, LLC 2004 ResourceLogix, LLC 2004 ResourceLogix, LLC </small>	
Water Source	Staging Area	Zones of Concern		
Power Lines/Poles				



Legend

- | | | |
|---------------------|---------------------|--------------|
| Priority Mitigation | Staging Area | Water Source |
| Hazard Zones | Ingress/Egress | Sage/Shrub |
| Community Boundary | Private/Minor Roads | Scrub Oak |
| | Power Lines | |

Figure 2.2



**Knez Divide
Priority
Mitigation Areas**

Moffat County Fire Plan
ResourceLogic, LLC 2004

WILDERNESS RANCH Community Fire Mitigation Plan

Community Profile

The Wilderness Ranch (WR) Community is located approximately 23 miles north of Craig, Colorado (State Highway 13/789) and approximately 7 miles east on Moffat County road 38. WR is a large mountain community that encompasses an area of approximately 16.5 square miles or 10,560 acres. The community was developed primarily for recreation and seasonal use cabins or second homes. There are 746 property parcels and 590 individual landowners. Tracts vary in size from 5-80 acres.

In 2001 it was verified there were 200 cabins on WR. Satellite imagery has identified 232 structures in 2004. In the past there have been a few year-round residents, but most landowners use their properties on a weekend or seasonal use basis. Land ownership is approximately 30 percent for the local area and 70 percent for other areas of Colorado and other states. Most landowners belong to the Wilderness Ranch Landowners Association, which is well organized and has good communications with owners through newsletters and board meetings. Most landowners are concerned that fire hazard ratings for the community prevent them from obtaining fire or hazard insurance coverage.

Values

Most residents acquired cabins and properties in the community for their recreational, aesthetic, and wildlife habitat values. Aspen and spruce/fir trees are the most important type of trees to residents. Most residents do not support wide spread cutting of trees in the area. Residents are interested in information, education, and financial support for removing and disposing of standing dead or downed timber on their properties.

Wildfire Risk Assessment

Fire History

There is no evidence of any significant wildfire activity in the community in the past 50 years or more. High-risk fuels such as oak/mountain shrub and timber (spruce/fir), which are found in the western and southern areas of the community, continue to move toward old age-class stands and represent an ever-increasing fire danger. In addition many of the spruce/fir stands are showing increased mortality with increased ground and ladder fuels, which increases the fire risk.

Fire Hazard

Vegetation is a mosaic of grass, sagebrush, Gambels oak, mountain shrub, aspen, and spruce/fir. The grasslands, sparse sagebrush, and aspen tend to pose a low hazard. Denser stand of sagebrush and oak/mountain shrub pose a moderate hazard. Spruce/fir poses a moderate to high hazard depending on density and the amount of ground fuels. Information including vegetation, elevation, slope, aspect, and satellite imagery has been used to determine locations of high-risk fuels in the community. Based on this information, nine *zones of concern* have been identified. Criteria for selecting the zones include high-risk fuels, clusters of cabins in close proximity, or a

combination of the first two criteria. The *zones of concern* are shown on Figure 3.3. Following is a list of the designated zones with associated acreages and structure information.

Table 3 – Wilderness Ranch Zones of Concern

Class	Zone Number	Perimeter (M)	Area (M)	Acres	Number of Structures	Acres per Structure	Threat*
Zone of Concern	1	6128.2	2445360.7	604.3	43	14.1	Fuels/DS
Zone of Concern	2	3462.7	764036.3	188.8	13	14.5	Fuels
Zone of Concern	3	3461.2	712917.1	176.2	15	11.7	Fuels/DS
Zone of Concern	4	5267.2	1429644.3	353.3	29	12.2	Fuels/DS
Zone of Concern	5	3499.1	558712.8	138.1	7	19.7	Fuels
Zone of Concern	6	4383.0	754405.1	186.4	7	26.6	Fuels
Zone of Concern	7	1112.1	57892.8	14.3	2	7.2	Fuels
Zone of Concern	8	2850.6	263851.3	65.2	7	9.3	Fuels
Zone of Concern	9	7616.1	1361379.6	336.4	34	9.8	DS

Table headings are explained as follows: Zone of Concern and Zone numbers labeled in Figure 3.3; Perimeter in meters; Area in meters; Acres in each zone; Number of structures in the zone; mean Acres per Structure in the zone; and Threat * which is the reason(s) for selecting the zones due to high risk fuels (Fuels), Density of Structures in each zone (DS), or a combination (Fuels/DS).

Wildland Urban Interface (WUI)

WR is an isolated rural recreation community. The community boundary designated in the plan is assumed to be the WUI. There are several types of WUI communities in Moffat County. These include interface communities, intermix communities, occluded interface and rural interface (see glossary for definitions). WR can be defined as a ‘intermix community’ where structures are scattered throughout the wildland area and wildland fuels are continuous outside of and within the developed area.

Protection Capabilities and Infrastructure

Water Sources

There several reliable water sources that could be used for wildland or structure fires. Sources include 10 truck accessible draft sites, 5 helicopter dip sites; and 3 dry hydrants. Locations were mapped in early October 2004 that should indicate reliability, especially after an extended drought (See Figure 3.2).

Safety zones/staging areas

There several large (5 acre +) open areas that are very adequate for staging areas as well as landing and safety zones along MCR 70 to the west and in the northern sections of the community. Areas have been mapped and are shown on Figure 3.2.

Roads

All roads within the community have been designated as County roads. There are three separate access roads to the community. These include MCR 38 from State Highway 13/789 (west access); MCR 38 traverses the community from west to east and intersects with MCR 1 at Slater Creek (east access); and MCR 70 from State Highway 13/789 which intersects with MCR 38 within the community (north access). County roads within the community that provide access to the numerous property parcels have been given common historic names. Prior to 2004, lack of

adequate signage on both the main and interior roads made it extremely difficult for emergency personnel and firefighters to efficiently locate roads or parcels within the community. Moffat County made a major effort during the summer of 2004 to install signs on MCR 38, MCR70, and the interior roads. These improvements should significantly reduce confusion and improve response times for emergency responders. Driveway access to individual parcels presents additional problems for firefighters. A majority of parcels are not marked with parcel numbers; driveways are narrow and may not allow access for heavy equipment; many parcels lack adequate turnaround space; and many cabins do not have adequate defensible space to reduce wildfire risk. County roads and driveway entrances have been mapped and are shown on Figure 3.2.

Utilities/phone service

There are no utilities or phone lines in the WR community. Landowners rely on solar systems or generators to provide power. Cell phone service is unreliable in many parts of the community and cannot be counted on for emergency notification.

Bridges

There are no bridges within the WR community. There are two bridges on two of the main County roads that provide access to the community; Willow Creek (MCR70) and Slater Creek (MCR 38/2). There are no restrictions or weight limits on the bridges.

Structure Analysis

Fire Risk Rating

Each structure within the community was delineated with a 100-ft. buffer and then assigned zero, positive, or negative values using the following criteria to develop a scoring system generally referred to as a “proximity assessment”. Each structure will be assigned a number and a cumulative score. This will provide the end user such as the Sheriff’s Department a comparative measurement that indicates the significance of risk that individual structures or groups of structures are exhibiting in the community. Maps and the complete rating system for every structure are based on an analysis of satellite imagery and will be provided in a separate report to Moffat County by Native Communities Development Corp. (NCDC).

Structure Fire-Risk Rating System (100-ft Buffer)

Timber = -1000
Scrub = -500

Safety Zone = 500
Powerlines = -500
Water Source = 1000

Sunlit* = -100 *Sunlit Aspect = increased dry fuels danger

Slope:
0 – 10 = 0
10 – 20 = -250
20 – 30 = -500
30 – 40 = -1000

Structure Ignitability

Structures were also analyzed, using satellite imagery, to identify the number of structures constructed with flammable roof materials (primarily shake shingle/wooden roofs). The Structural Ignitability analysis report will also be provided to Moffat County by NCDC.

Mitigation Action Plan

Current Projects

The U.S. Forest Service has initiated a planning process (2004-2005) for fuel reduction and beetle infestation mitigation on public lands along the south boundary of the WR community. Implementation will take place in 2005-2006. A cooperative effort between the USFS and WR landowners has significant potential for reducing wildfire risk in the community.

Fuel Reduction Recommendations

Roads

Roads and loop roads within the community offer a significant firebreak opportunity. The County road rights-of-way are 100 feet. It is recommended that the County clear the full width of the row annually by mowing, brush beating, or other means early in the fire season annually. The effort should be concentrated in the identified areas with high-risk fuel types (timber & oak/mountain shrub) and MCR 38 and 70.

Grazing

Livestock use can be an excellent tool for reducing fine fuels if adequate planning and management are implemented for livestock numbers, season of use, and timing of use. WR allows for some grazing use although not all landowners support grazing leases or grazing on their parcels.

Fuel reduction in high-risk areas

In connection with the zones of concern designated as a part of the wildfire risk assessment described previously, thirteen fuel reduction treatment projects are recommended for areas where oak/mountain shrub and spruce fir indicate a potentially high risk for wildfire. These areas are located mainly along the southern boundaries of the community. In zones of concern where fuel reduction is not recommended, landowners are encouraged to create or improve defensible space around cabins. Following is a list (see Table 4) of recommended projects and associated acreages. Recommended treatment options/costs include hand thinning (\$300-\$800/ac.), mechanical thinning—hydro ax or similar treatment (\$250-\$500/ac.), brush beating for treatment areas along roads (\$20-\$70/ac.), or roller chopping brush and small trees (\$60-\$120/ac.).

Table 4 – Wilderness Ranch Fuel Mitigation Projects

COMMUNITY	PROJECT #	ZONE OF CONCERN	AREA (Ft.)	PERIMETER	HECTARES	MITIGATION ACRES
Wilderness Ranch	12	Zone 2--South	184,396.7	1,913.8	1.7	4.2
Wilderness Ranch	13	Zone 1--West	555,087.0	4,995.2	5.2	12.7
Wilderness Ranch	14	Zone 1--West	94,142.5	1,161.5	0.87	2.2
Wilderness Ranch	15	Zone 1--North	864,957.9	7,558.4	8.1	19.9
Wilderness Ranch	16	Zone 1--East	208,076.1	2,110.5	1.9	4.8
Wilderness Ranch	17	Zone 1--East	618,013.0	5,478.6	5.7	14.2
Wilderness Ranch	18	Zone 1--East	905,217.0	3,673.6	8.4	20.8
Wilderness Ranch	19	Zone 1--East	524,516.0	3,637.5	4.9	12.0
Wilderness Ranch	20	Zone 1--East	256,524.7	3,768.9	2.4	5.9
Wilderness Ranch	21	Zone 4--South	291,191.9	5,255.4	2.7	6.7
Wilderness Ranch	22	Between Zones 4 & 9	380,802.8	3,550.5	3.5	8.7
Wilderness Ranch	23	Between Zones 5 & 6	503,863.8	4,567.0	4.7	11.6
Wilderness Ranch	24	Between Zones 5 & 6	503,863.8	4,567.0	4.7	11.6

Fuel Reduction Project Plans

Site specific recommendations and information for each fuel reduction project is included in Appendix F. The plans include a description and need for proposed actions, general treatment recommendations, discussion of watershed issues, discussion of wildlife habitat/species of concern issues and identification of any constraints or unique circumstances associated with each proposed project.

Monitoring and Evaluation

To ensure the plan maintains its relevance and effectiveness over time, the objective is to monitor the effectiveness of fuel treatment projects, on both federally managed and privately owned lands in Moffat County, that are designed to reduce fire hazard by managing fuels. This will be done with the following procedures:

- 1) Establish photo points and plots in each of the two main fuel categories: timber or woodlands and brush stands.
- 2) Take before and after measurements. Photos should be taken in early summer and fall to document seasonal fuel conditions.
- 3) If prescribed fire is a treatment, use a weather/fuels/fire behavior form to record findings.
- 4) Establish plots and/or transects to monitor tree growth and survival, changes in canopy cover/species composition, and plant community response after burning.
- 5) A community-wide GIS overlay will provide an overall look at the effectiveness of reducing fuels buildup and fire hazard ratings.
- 6) Reporting will occur at 3-5 year intervals, through at least three treatment cycles.

Taken all together, these components will provide information to determine Moffat County's effectiveness in decreasing overall fire hazard ratings for four communities at risk.

Emergency Operations

Current Activities

Wildland suppression procedures

The Moffat County Sheriff's Department has primary responsibility for responding to fire or other emergencies. The Craig Rural Fire Department may provide assistance if equipment is available. The WR community is not located within the CRFD Fire District. Response times to the WR community vary from 45-60 minutes depending on which access is used and where an emergency occurs.

Structural

Driveway access locations and structures have been mapped and identified on Figure 3.2 and should significantly improve timing for locating structures in an emergency.

Inventory of fire protection resources

A list of firefighting equipment available to the Sheriff's Department is shown in Appendix D.

Emergency contact information

The WR Landowners Association has a landowner information database names, addresses, and parcel numbers, however phone numbers are not included. Requests have been made, in mailings and community meetings, for landowners to provide phone numbers for emergency contact. The technology for a Reverse 911 system is not currently available in northwest Colorado. Appendix I contains a partial list of names, addresses, and phone numbers including local residents and WRLA board members (Confidential).

Mutual aid agreements

An Annual Fire Operating Plan (AOP) has been developed in Moffat County for the purpose setting forth standard operating procedures, policies, and responsibilities for implementing cooperative wildfire protection on all lands within the county. Participants in the AOP include the Moffat County Sheriff, Moffat County Board of County Commissioners, USFS—Hahns

Peak District, BLM—Craig Field Office, BLM—Meeker Field Office, NPS—Dinosaur National Monument, USFWS—Browns Park National Wildlife Refuge, and the Colorado State Forest Service. The AOP is contained in Appendix C.

Recommendations for Improving Emergency Preparedness

Driveway/parcel identification

It is recommended that all landowners install parcel number signs at driveway entrances to improve emergency location and response time.

Access to structures

Many tracts in the community do not have adequate driveway widths, turnaround space, or defensible space around structures to provide safe access for firefighters. Appendix B provides information and recommendations for driveway specifications and defensible space around homes or cabins. Landowners are encouraged to utilize this information to reduce structural vulnerability and improve safety for both firefighters and homeowners.

Telephone tree

In addition to an emergency contact list that will be available at the Colorado State Patrol office in Craig, it is recommended that landowners develop an internal telephone tree to improve contact or evacuation notification in an emergency.

On-site fire equipment

Moffat County should consider the purchase of a WR parcel for the purpose of establishing an on site location for fire equipment during the fire season. The equipment could serve both the Wilderness Ranch and Bakers Peak communities and could significantly reduce response times for wildland or structure fires. A second alternative would be for the County to request the donation of a suitable public land parcel from BLM or the USFS for the same purpose.

Evacuation Plan

Moffat County should develop an evacuation plan for the community. Several elements identified in this plan, including ingress and egress to the community, roads within the community, individual driveways, and high risk fuel areas, will be essential in the development of an evacuation plan.

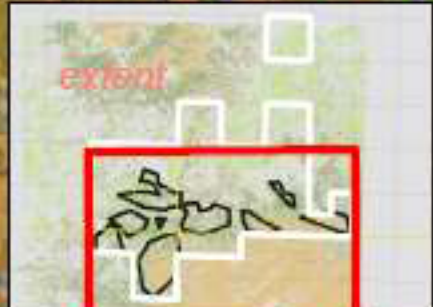
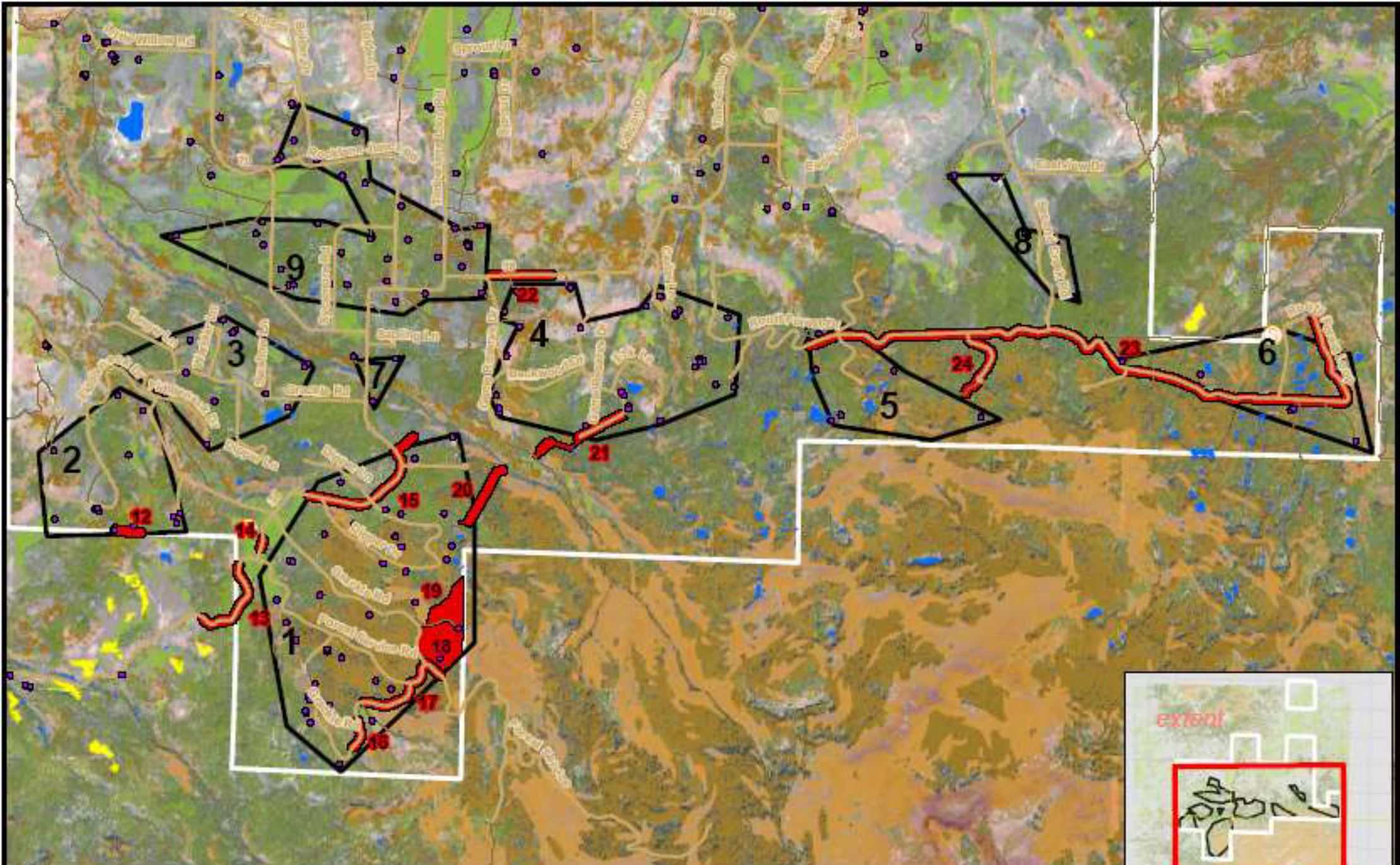


see Baker Peak Map

Legend					
Ingress_Egress	Blocked Road	Cattle Guard	Water Source	Power Lines/Lines	Hazardous Slope
Roads	WaterCrossings	Landmarks	Dip Sites	Structures	Draft Sites
Private/Minor Roads	East Access Gate (Unlocked)	Safety Zone	Staging Area	Community Boundary	Wilderness Ranch

Figure 3.2

Scale: 0 0.5 1 Miles
 Data Sources: 20M Quadtan Imagery, BLM, in-situ GPS, Moffat County assessor's data, USGS DEM, and HEC2 imagery-derived data (rivers, safety zones and structures)



Features

- | | | | |
|---------------------|--------------------|-------------|---------------------|
| Priority Mitigation | Water Source | Structures | Hazardous Slope |
| Hazard Zones | Community Boundary | Power Poles | |
| Safety Zone | Power Lines | Roads | Private/Minor Roads |

Fuels

- | | |
|------------|------------|
| Sage/Shrub | Aspen |
| Scrub Oak | Spruce/Fir |



Wilderness Ranch Mitigation Areas

Moffat County Fire Plan
ResourceLogic, LLC 2004

BAKERS PEAK Community Fire Mitigation Plan

Community Profile

The Bakers Peak community is located approximately 29 miles north of Craig, Colorado (State Highway 13/789) and approximately 8 miles east on Moffat County road 70. The community encompasses an area of approximately 12 square miles or 7,680 acres. The community was developed primarily for recreation and seasonal use cabins or second homes. There are 104 property tracts that vary in size from 40-80 acres. Satellite imagery has identified 140 structures (includes cabins & associated outbuildings) in 2004. There are two year-round residents, but most landowners use their properties on a weekend or seasonal use basis. Land ownership is approximately 10 percent for the local area and 90 percent for eastern Colorado and other states. Most landowners belong to the Bakers Peak Landowners Association, which is well organized, has good communications with owners, and has an annual budget for fencing, road repairs, access improvements, and other needs. Many landowners are concerned that fire hazard ratings for the community prevent them from obtaining fire or hazard insurance coverage.

Values

Most residents acquired cabins and properties in the community for their recreational, aesthetic, and wildlife habitat values. Aspen and spruce/fir trees are the most important type of trees to residents. Most residents do not support wide spread cutting of trees in the area. Residents are interested in information, education, and financial support for removing and disposing of standing dead or downed timber on their properties.

Wildfire Risk Assessment

Fire History

There is no evidence of any significant wildfire activity in the community in the past 50 years or more. High-risk fuels such as oak/mountain shrub and timber (spruce/fir), which are found in the central and northern areas of the community, continue to move toward old age-class stands and represent an ever-increasing fire danger. In addition many of the spruce/fir stands are showing higher mortality leading to more ground and ladder fuels, which increases the fire risk.

Fire Hazard

Vegetation is a mosaic of grass, sagebrush, Gambels oak, mountain shrub, aspen, and spruce/fir. The grasslands, sparse sagebrush, and aspen tend to pose a low hazard. Denser stand of sagebrush and oak/mountain shrub pose a moderate hazard. Spruce/fir poses a moderate to high hazard depending on density and the amount of ground fuels. Information including vegetation, elevation, slope, aspect, and satellite imagery has been used to determine locations of high-risk fuels in the community. Based on this information, eleven *zones of concern* have been identified. Criteria for selecting the zones include high-risk fuels, clusters of cabins in close proximity, or a combination of the first two criteria. The *zones of concern* are shown on Figure 4.3. Following is a list of the designated zones with associated acreages and structure information.

Table 5 – Bakers Peak Zones of Concern

Class	Zone Number	Perimeter (M)	Area (M)	Acres	Number of Structures	Acres per Structure	Threat*
Zone of Concern	10	3955.94	577445.9	142.7	19	7.5	Fuels/DS
Zone of Concern	11	2165.51	298671.6	73.8	12	6.2	Fuels/DS
Zone of Concern	12	3929.34	1004180.1	248.1	18	13.8	Fuels/DS
Zone of Concern	13	2297.58	280996.9	69.4	8	8.7	DS
Zone of Concern	14	2845.32	544424.8	134.5	12	11.2	Fuels
Zone of Concern	15	1861.50	153675.1	38.0	6	6.3	Fuels/DS
Zone of Concern	16	1748.18	165317.2	40.9	11	3.7	DS
Zone of Concern	17	1789.98	163518.0	40.4	3	13.5	Fuels
Zone of Concern	18	1911.15	130179.3	32.2	9	3.6	Fuels
Zone of Concern	19	4108.70	1087050.4	268.6	18	14.9	Fuels
Zone of Concern	20	852.15	44557.3	11.0	3	3.7	Fuels

Table headings are explained as follows: Zone of Concern and Zone numbers labeled in Figure 4.3; Perimeter in meters; Area in meters; Acres in each zone; Number of structures in the zone; mean Acres per Structure in the zone; and Threat * which is the reason(s) for selecting the zones due to high risk fuels (Fuels), Density of Structures in each zone (DS), or a combination (Fuels/DS).

Wildland Urban Interface (WUI)

BP is an isolated rural recreation community. The community boundary designated in the plan is assumed to be the WUI. There are several types of Wildland Urban Interface (WUI) communities in Moffat County. These include interface communities, intermix communities, occluded interface and rural interface (see glossary for definitions). BP can be defined as a ‘rural interface community’ where scattered small clusters of structures (summer cabins) are exposed to wildland fuels. In some cases, there are miles between these clusters.

Protection Capabilities and Infrastructure

Water sources

Reliable water sources are fairly limited within the community. There are twelve small ponds that are truck accessible draft sites and two larger ponds that are adequate for helicopter dip sites. GPS readings were recorded in early September 2004 and are shown on Figure 4.2.

Staging areas

There are no adequate staging areas within the community. There are designated staging areas in the adjacent Wilderness Ranch community along CR 70 that could serve the west access to BP and along CR 38 that the east access to Bakers Peak. These staging areas are shown on Figure 3.2 of the Wilderness Ranch Mitigation Plan.

Landing/safety zones:

Several areas have been designated as potential landing/safety zones and are shown on Figure 4.2. The areas are open meadows that are generally less than an acre in size. The areas are adequate for landing zones, but are probably not adequate for safety zones depending on fire location and behavior.

Roads

There are no County roads within the community. All roads are privately owned and are generally narrow (10 ft. width), rough, and steep in many places. There are a series of inter-

connecting loop roads throughout the community, however, there are several dead end roads. There are very few adequate turnarounds on both the main roads and individual driveways. A few low spots have been graveled to improve access, however most road surfaces will become impassable when wet, especially for firefighting equipment. Roads and driveway entrances have been mapped and historic road names have been kept at the request of the Bakers Peak Landowners Association (see Figure 4.2). Most roads have a thick canopy of vegetative cover on both sides that severely compromises safety for firefighters and residents during a fire.

Landmarks

Residents have also requested that landmarks be identified and mapped to improve response times and communications during an emergency. Landmarks include loop road intersections, a historic cabin, and other sites commonly referred to by landowners (see Figure 4.2).

Access Issues

There were originally three separate access points to the Bakers Peak community. Access was from MCR 70N (west); MCR 2 (north); and MCR 38 (east). In 1998 both the north and east access roads were closed due to disputes with adjacent landowners to the north and east of the BP community boundaries. The east access from MCR 38 was re-established across State Land Board and BLM lands in December 2001. The north access remains closed and blocked with trenches dug by a backhoe, which prevents access even for emergency personnel. According to BP landowners the north access provided the best route for emergency responders as well as the best escape route to evacuate the mountain.

Utilities

There are no utilities in the BP community. Landowners rely on solar systems or generators to provide power.

Bridges

There are no bridges within the BP community. There are two bridges on the main County roads, which are Willow Creek (MCR 70) and Slater Creek (MCR 38/2). There are no restrictions or weight limits on the bridges.

Abandoned Structures

There is an abandoned house on tracts 94 and 95. Construction was never fully completed and the house has been vacant for several years. There are propane bottles both inside and outside the structure. Adjacent landowners are concerned about the potential fire hazard and are requesting that the situation be researched and resolved by the Sheriff's Department.

Structure Analysis

Fire Risk Rating

Each structure within the community was delineated with a 100-ft. buffer and then assigned zero, positive, or negative values using the following criteria to develop a scoring system generally referred to as a “proximity assessment”. Each structure will be assigned a number and a cumulative score. This will provide the end user such as the Sheriff’s Department a comparative measurement that indicates the significance of risk that individual structures or groups of structures are exhibiting in the community. Maps and the complete rating system for every structure are based on an analysis of satellite imagery and will be provided in a separate report to Moffat County by Native Communities Development Corp. (NCDC).

Structure Fire-Risk Rating System (100-ft Buffer)

Timber = -1000

Scrub = -500

Safety Zone = 500

Powerlines = -500

Water Source = 1000

Sunlit* = -100

*Sunlit Aspect = increased dry fuels danger

Slope:

0 – 10 = 0

10 – 20 = -250

20 – 30 = -500

30 – 40 = -1000

Structure Ignitability

Structures were also analyzed, using satellite imagery, to identify the number of structures constructed with flammable roof materials (primarily shake shingle/wooden roofs). The Structural Ignitability analysis report will also be provided to Moffat County by NCDC.

Mitigation Action Plan

Fuel Reduction Recommendations

Roads

The main roads and loop roads within the community offer a significant firebreak opportunity. Reducing vegetation along the roads and thinning to a width of 100-120 feet along the main roads with a 20-30 foot spacing between trees would provide important fire breaks throughout the community.

Grazing

The use of livestock can be an excellent tool for reducing fine fuels if adequate planning and management are implemented for livestock numbers, season of use, and timing of use. Although there are a few landowners that allow grazing by two livestock owners, The BP community

should consider some level of grazing that would be acceptable to all landowners and help reduce the risk of wildfire.

Fuel reduction in high-risk areas

In connection with the zones of concern designated as a part of the wildfire risk assessment described previously, eleven fuel reduction treatment projects are recommended for areas where oak/mountain shrub and spruce fir indicate a potentially high risk for wildfire. These areas are located mainly central and northern areas of the community. In zones of concern where fuel reduction is not recommended, landowners are encouraged to create or improve defensible space around cabins. Following is a list (see Table 6) of recommended projects and associated acreages. Recommended treatment options/costs include hand thinning (\$300-\$800/ac.), mechanical thinning—hydro ax or similar treatment (\$250-\$500/ac.), brush beating for treatment of sagebrush (\$20-\$70/ac.), or roller chopping brush and small trees (\$60-120/ac.).

Table 6 – Bakers Peak Fuel Mitigation Projects

Community	Project Number	Zone of Concern	Area (Ft.)	Perimeter	Hectares	Mitigation Acres
Bakers Peak	1	Between Zones 10 & 11	1,011,410.7	8,730.8	9.4	23.2
Bakers Peak	2	Zone 11--South	279,751.9	2,698.9	2.6	6.4
Bakers Peak	3	Zone 12--South	282,487.9	2,679.6	2.61	6.5
Bakers Peak	4	Zone 12--South	112,362.4	1,313.4	1.4	2.6
Bakers Peak	5	Zone 12--South	157,413.4	1,688.1	1.5	3.6
Bakers Peak	6	Zone 12--South	406,430.8	3,764.0	3.8	9.3
Bakers Peak	7	Between Zones 12 & 14	679,617.8	6,037.0	6.3	15.6
Bakers Peak	8	Zones 14 and 15	1,682,534.4	14,313.7	15.6	38.6
Bakers Peak	9	Between Zones 15 & 17	660,343.2	5,863.4	6.1	15.2
Bakers Peak	10	Zone 17--South	845,612.2	7,363.5	7.9	19.4
Bakers Peak	11	Between Zones 16 & 18	785,833.6	6,906.6	7.3	18

Fuel Reduction Project Plans

Site-specific recommendations and information for each fuel reduction project is included in Appendix F. The plans include a description and need for proposed actions, general treatment recommendations, discussion of watershed issues, discussion of wildlife habitat/species of concern issues, and identification of any constraints or unique circumstances associated with each proposed project.

Monitoring and Evaluation

To ensure the plan maintains its relevance and effectiveness over time, the objective is to monitor the effectiveness of fuel treatment projects, on both federally managed and privately owned lands in Moffat County, that are designed to reduce fire hazard by managing fuels. This will be done with the following procedures:

- 1) Establish photo points and plots in each of the two main fuel categories: timber or woodlands and brush stands.
- 2) Take before and after measurements. Photos should be taken in early summer and fall to document seasonal fuel conditions.
- 3) If prescribed fire is a treatment, use a weather/fuels/fire behavior form to record findings.
- 4) Establish plots and/or transects to monitor tree growth and survival, changes in canopy cover/species composition, and plant community response after burning.
- 5) A community-wide GIS overlay will provide an overall look at the effectiveness of reducing fuels buildup and fire hazard ratings.
- 6) Reporting will occur at 3-5 year intervals, through at least three treatment cycles.

Taken all together, these components will provide information to determine Moffat County's effectiveness in decreasing overall fire hazard ratings for four communities at risk.

Emergency Operations

Current Activities

Wildland suppression procedures

The Moffat County Sheriff's Department has primary responsibility for responding to fire or other emergencies. The Craig Rural Fire Department may provide assistance if equipment is available. Response times to the community from Craig vary from 60-120 minutes depending on which access is used and where an emergency occurs on the mountain.

Structural

Driveway access locations and structures have mapped and identified on Figure 4.2 and should significantly improve location of structures in an emergency.

Inventory of fire protection resources

A list of firefighting equipment available to the Sheriff's Department is shown in Appendix D.

Emergency contact information

The BP Landowners Association has a good community information database which includes names, addresses, tract numbers, and phone numbers. The list is contained in Appendix I (Confidential).

Mutual aid agreements

An Annual Fire Operating Plan (AOP) has been developed in Moffat County for the purpose setting forth standard operating procedures, policies, and responsibilities for implementing cooperative wildfire protection on all lands within the county. Participants in the AOP include the Moffat County Sheriff, Moffat County Board of County Commissioners, USFS—Hahns Peak District, BLM—Craig Field Office, BLM—Meeker Field Office, NPS—Dinosaur National Monument, USFWS—Browns Park National Wildlife Refuge, and the Colorado State Forest Service. The AOP is contained in Appendix C.

Recommendations for Improving Emergency Preparedness

Improved access

One of the biggest concerns for BP landowners is the closed north access road. It is recommended that the County, State, and Federal fire management agencies enter into discussions with adjacent landowners and request the road be re-opened for ingress or egress during emergencies.

Driveway/tract identification

It is recommended that all landowners install tract number signs at driveway entrances to improve emergency location and response time.

Access to structures

Many tracts in the community do not have adequate driveway widths, turnaround space, or defensible space around structures to provide safe access for firefighters. Appendix B provides information and recommendations for driveway specifications and defensible space around homes or cabins. Landowners are encouraged to utilize this information to reduce structural vulnerability and improve safety for both firefighters and homeowners.

Telephone tree

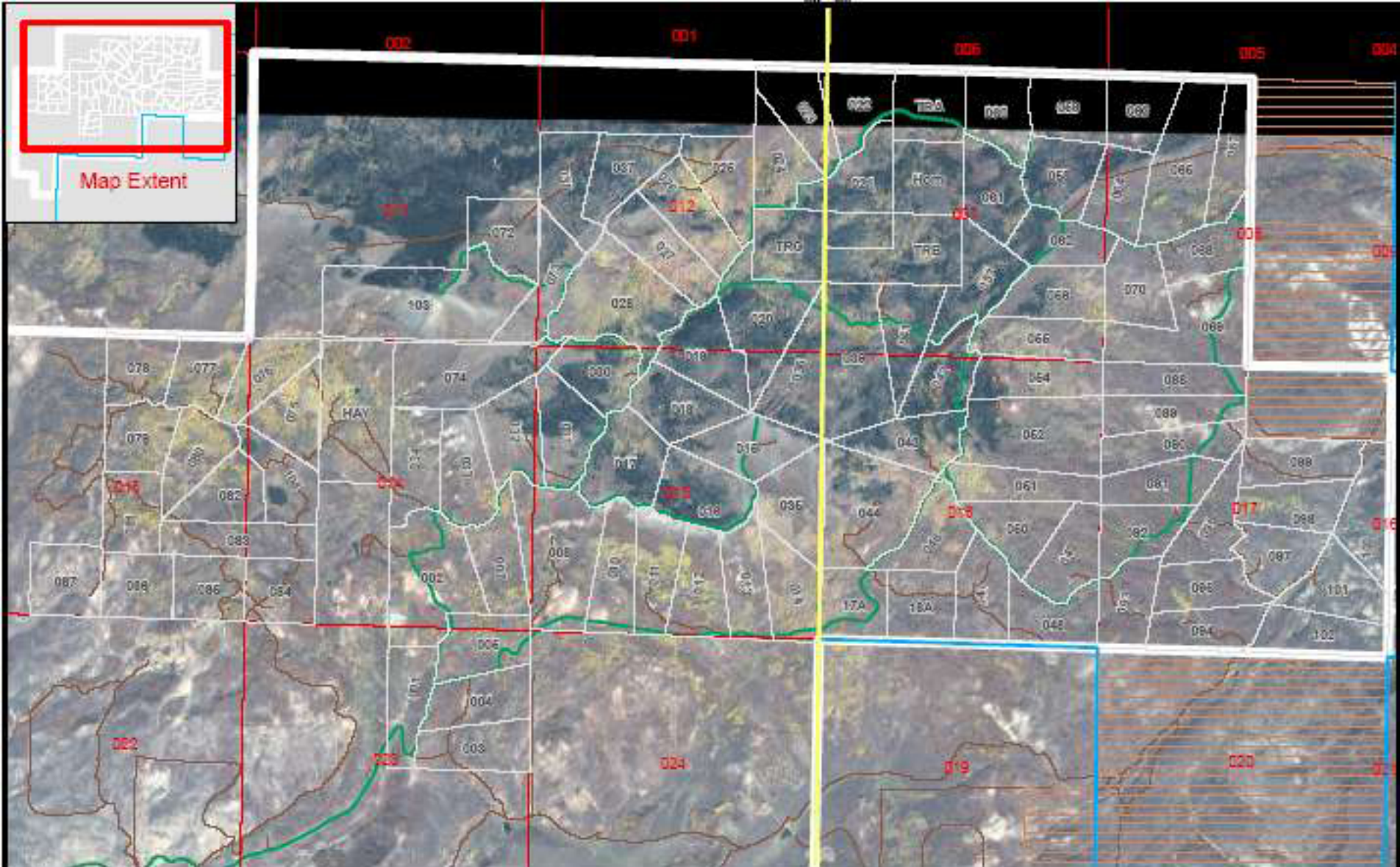
In addition to an emergency contact list that will be available at the Colorado State Patrol office in Craig, it is recommended that landowners develop an internal telephone tree to improve contact or evacuation notification in an emergency.

Evacuation Plan

Moffat County should develop an evacuation plan for the community. Several elements identified in this plan, including ingress and egress to the community, roads within the community, individual driveways, and high risk fuel areas, will be essential in the development of an evacuation plan.



Map Extent



Legend

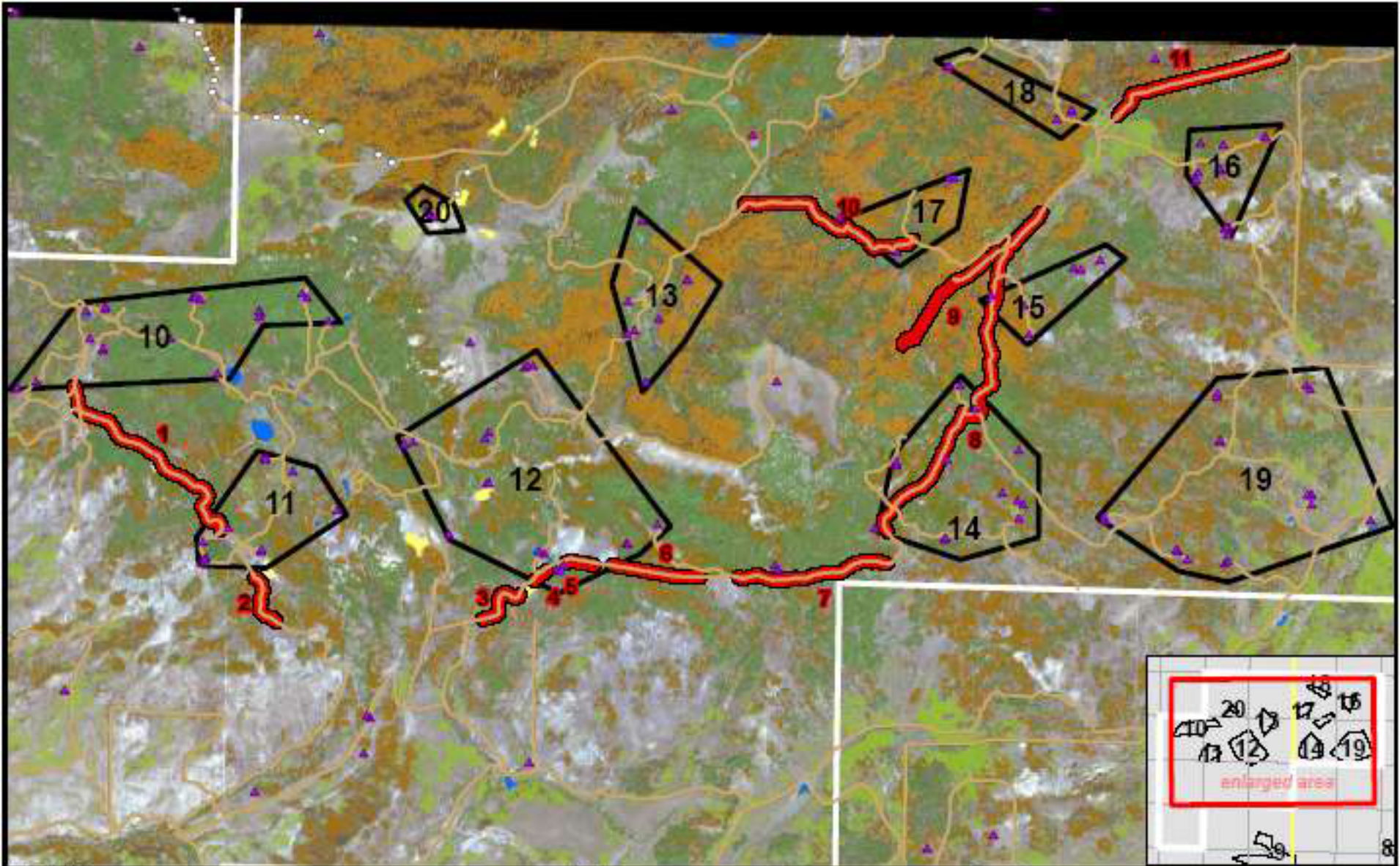
- Ingress/Egress
- Private/Minor Roads
- Community Boundary
- Wilderness Ranch
- Parcels (with Lot #)
- BLM Property

Figure 4.1



Bakers Peak
Land Ownership &
Cadastral Boundaries
 Mohave County Fire Plan
 November 4, 2014

Data sources: 2014 Quincennial Survey, LRS/IL Land Ownership data, as of 1/1/14, Mohave County Assessor's data, and NCEC imagery, Behrman Associates



Features

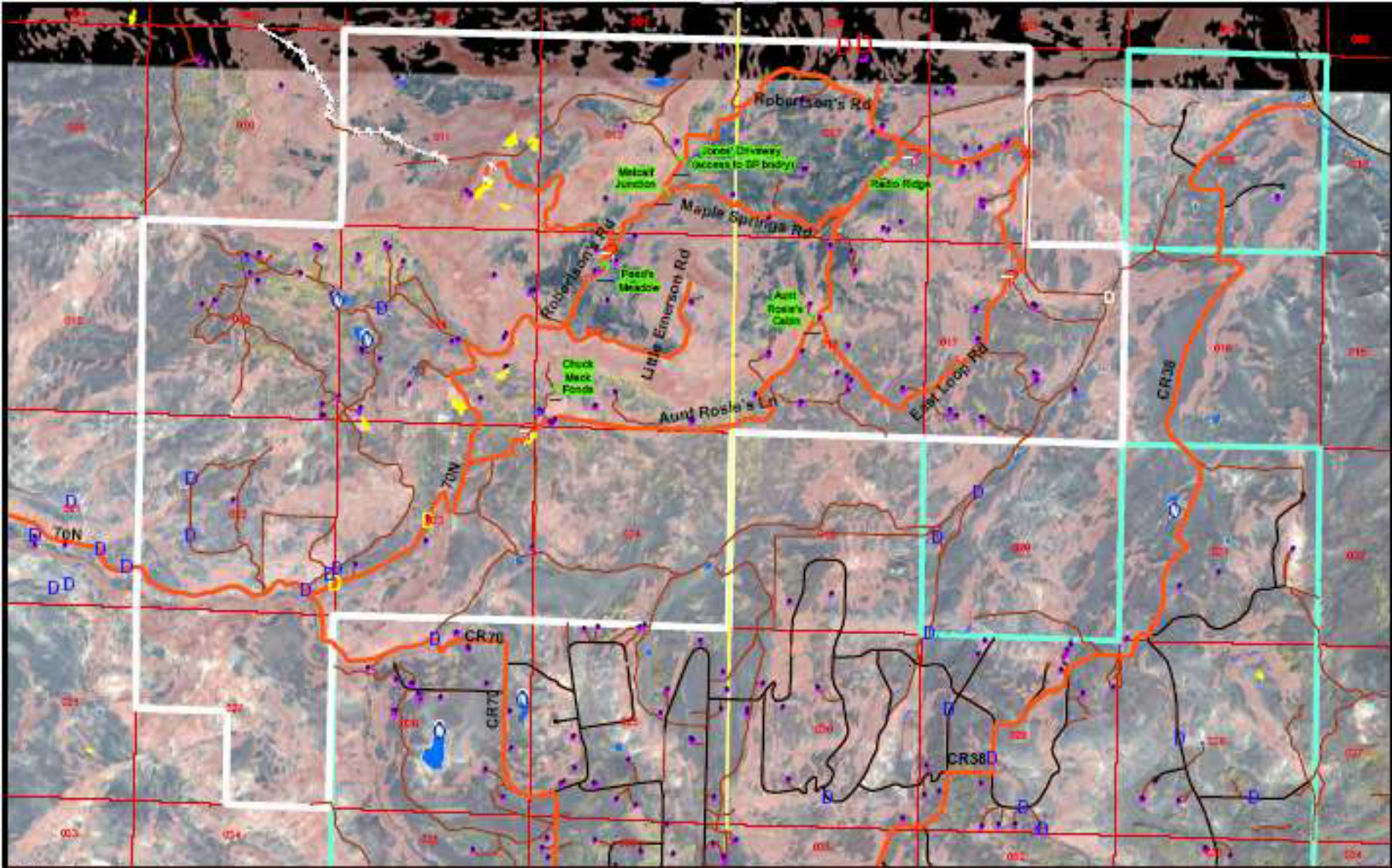
Priority Mitigation	Water Source	Structures
Hazard Zones	Community Boundary	Power Poles
Safety Zone	Power Lines	Roads

Fuels

Sage/Shrub	Aspen
Scrub Oak	Spruce/Fir

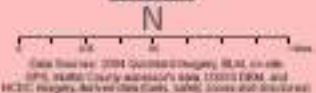
Figure 4.2
 Data Source: 2004 QuickScan Imaging, ESRI, ArcGIS, Mafco County, Microsoft's Map, USGS DEM, and NCEM imagery-derived base data, safety zones not depicted.





Legend	Ingress_Egress	Blocked Road	Cattle Guard	Water Source	Power Lines & Poles	Hazardous Slope
Roads	Water Crossings	Landmarks	Dip Sites	Structures	Community Boundary	Wilderness Ranch
Private/Minor Roads	East Access Gate (Unlocked)	Safety Zone	Landing Zones	Community Boundary		

Figure 4.2



**Bakers Peak
Pre-Emergency
Planning**

Data Sources: 2004 QuattroGeographics, Inc. 1:50,000
GPS, Multis County address/s 100001 10000, and
MCC: imagery, delivery data (2004, 2005) from the State of Colorado

GREYSTONE Community Fire Mitigation Plan

Community Profile

The community of Greystone is located approximately 70 miles west of Craig, Colorado (State Highway 318) and approximately 5 miles south on Moffat County Road 10. The development density in Greystone ranges from structures very close together to one structure per forty acres. There are fourteen landowners in Greystone and sixteen separate property parcels. Five landowners are year-round residents while others generally live there on weekends and at certain times of year. Ten parcels have homes located on them. There is one main gravel road, County Road 10 that continues through Greystone. The road receives regular maintenance by the County. Most adjoining lands consist of Bureau of Land Management or large, privately owned tracts that are primarily used for livestock grazing.

Values

Most residents do not support any widespread cutting (clear cuts) of trees in the area. Pinyon trees are the most important type of trees to residents because most of the trees that occur are juniper trees. Residents do not support leaving a lot of slash on the ground and would like to see slash disposed of in some form. Would rather see shrubby, bushy trees cut down and would like to maintain “traditional-looking” trees with one main trunk. Most residents would like to preserve the most trees possible for wildlife habitat and aesthetic reasons.

Wildfire Risk Assessment

Fire History

There is no evidence of any significant recent wildfire activity within the community boundaries. There have been several wildfires to the west and south of the community in the past ten years. There have also been several BLM prescribed burn projects to the south and west of the community including Upper and lower Browns Draw, Five Springs, and Ryegrass.

Fire Hazard

Weather

The weather in Greystone during the fire season (June – September) is generally dry, hot and windy. Topography in the area is generally flat with steep slopes leading up to the community occurring on adjacent property directly to the west. Fuels generally consist of contiguous stands of sagebrush and pinyon-juniper trees. There is also a good source of fine fuels including dried grasses, fallen branches, and pine needles. Most of the houses in Greystone are built in the trees away from the main road. Narrow driveways and limited access pose a concern in the area along with limited water supplies.

Fuels

Information including vegetation, elevation, slope, aspect, field verification, and satellite imagery has been used to determine locations of high-risk fuels in the community. Fuels along the west and south side of the community pose the greatest threat to the community due to prevailing winds coming primarily out of the west. Thick tree stands with continuous canopies along with contiguous sagebrush canopies occur on the west and south side. Fuels on the east side of Greystone consist primarily of contiguous sagebrush stands and pose a medium risk for wildfire.

Wildland Urban Interface (WUI)

There are several types of Wildland Urban Interface (WUI) communities in Moffat County. These include interface communities, intermix communities, occluded interface and rural interface (see glossary for definitions). Greystone can be defined as an 'intermix community' where structures are scattered throughout the wildland area and wildland fuels are continuous outside of and within the developed area.

Protection Capabilities and Infrastructure

Water Sources

Reliable water sources are very limited within the community. There is an underground storage tank on the adjacent Raftopoulos property. The tank has a capacity of 6,000 gallons and is used primarily for livestock watering. There are three small ponds on the Burton property located in or adjacent to the southeast portion of the community that are accessible as draft sites. (See Figure 5.2)

Staging Areas

There are several adequate staging areas immediately adjacent to the community including the intersections of MCR10/56 on the north and MCR10/119 on the south. (See Figure 5.2)

Safety Zones

These areas are identified on Figure 5.2.

Roads

MCR 10 bisects the community and provides access from the north and east. All of the driveway access roads to landowner parcels connect to MCR 10. Several driveways are narrow and lack adequate turnaround space. Roads and driveway entrances have been mapped and are shown on Figure 5.2.

Utilities/phone service

The community has electric service. There are no phone lines that serve the community. Cell phone service has been unreliable in many parts of the community and cannot be counted on for emergency notification. A new cell phone tower, that should improve coverage, has been approved and will be located along MCR 10 one-half mile east of the Ladore RAWS Weather Station.

Bridges

There are no bridges within the community.

Structure Analysis

Fire Risk Rating

Each structure within the community was delineated with a 100-ft. buffer and then assigned zero, positive, or negative values using the following criteria to develop a scoring system generally referred to as a “proximity assessment”. Each structure will be assigned a number and a cumulative score. This will provide the end user such as the Sheriff’s Department a comparative measurement that indicates the significance of risk that individual structures or groups of structures are exhibiting in the community. Maps and the complete rating system for every structure are based on an analysis of satellite imagery and will be provided in a separate report to Moffat County by Native Communities Development Corp. (NCDC).

Structure Fire-Risk Rating System (100-ft Buffer)

Timber = -1000
Scrub = -500

Safety Zone = 500
Power lines = -500
Water Source = 1000

Sunlit* = -100 *Sunlit Aspect = increased dry fuels danger

Slope:
0 – 10 = 0
10 – 20 = -250
20 – 30 = -500
30 – 40 = -1000

Structure Ignitability

Structures were also analyzed, using satellite imagery, to identify the number of structures constructed with flammable roof materials (primarily shake roofs). The Structural Ignitability analysis report will also be provided to Moffat County by NCDC.

Mitigation Action Plan

Current Projects/Fuel Reduction Recommendations

Contractors worked with landowners, community members, and the BLM to identify where fuel breaks are practical and where federal, state, and local governments can partner with landowners to accomplish jointly supported fuel breaks. The proposed fuel breaks have been designed to work with existing fuel breaks and are planned to avoid private property owned by people not wishing to participate in the project. The fuel break on the south end of the community was re-designed in August 2004 to utilize an existing road and then extended to MCR10. Participants

agreed on a thinning project in pinyon/juniper that included a fuel break width of 150 ft. and spacing between trees of 20-30 ft. The BLM portion of the project was completed in the fall of 2004. The private land portion across Churchill was flagged, but has not been completed (See Figure 5.3)

The fuel break on the north end of the community was re-designed and moved, at the request of landowners, to BLM lands on the western edge of the community. This fuel break was also a thinning project with the same specifications. BLM fire personnel partially completed this project in the fall of 2004 (See Figure 5.3).

There are two fuel reduction projects (designed in 2003) that are located on privately owned parcels (Vaughn and Malloy). Both landowners are interested in fuel reduction, primarily hand thinning and have done some work on their own. There are two landowners (Lord and Bassett) that have stated they do not want to participate in fuel reduction projects on their private property (See Figure 5.3).

Landowners on the east side of the community have requested fuel reduction in dense sagebrush stands. Recommended treatment is to use a brush beater to mow a 120-150 ft. strip approximately one mile in length along the eastern boundary of the community. The size of the treatment would be in the range of 14.5 to 18.2 acres.

Fuel reduction costs

Estimated per acre fuel treatment costs supplied by BLM include the following options: brush beating sagebrush (mowing), \$20-\$70; Hydro ax or similar treatment, \$250-\$300; roller chopping brush and small trees, \$60-\$120; hand thinning (private contractor, no pile burning), \$300-\$1200; hand thinning (federal employees, includes pile burning), \$800-\$1200.

Fuel Reduction Project Plans

Site-specific recommendations and information for each fuel reduction project is included in Appendix F. The plans include a description and need for proposed actions, general treatment recommendations, discussion of watershed issues, discussion of wildlife habitat/species of concern issues and identification of any constraints or unique circumstances associated with each proposed project.

Monitoring and Evaluation

To ensure the plan maintains its relevance and effectiveness over time, the objective is to monitor the effectiveness of fuel treatment projects, on both federally managed and privately owned lands in Moffat County, that are designed to reduce fire hazard by managing fuels. This will be done with the following procedures:

- 1) Establish photo points and plots in each of the two main fuel categories: timber or woodlands and brush stands.
- 2) Take before and after measurements. Photos should be taken in early summer and fall to

document seasonal fuel conditions.

- 3) If prescribed fire is a treatment, use a weather/fuels/fire behavior form to record findings.
- 4) Establish plots and/or transects to monitor tree growth and survival, changes in canopy cover/species composition, and plant community response after burning.
- 5) A basin-wide GIS overlay will provide an overall look at the effectiveness of reducing fuels buildup and fire hazard ratings.
- 6) Reporting will occur at 3-5 year intervals, through at least three treatment cycles.

Taken all together, these components will provide information to determine Moffat County's effectiveness in decreasing overall fire hazard ratings for four communities at risk.

Emergency Operations

Current Activities

Wildland suppression procedures

The Moffat County Sheriff's Department has primary responsibility for responding to fire or other emergencies. The Maybell Fire Department will be notified by Craig dispatch and is likely to be the first responder. The National Park Service stations an engine in Browns Park during the fire season annually and will respond depending on the fire situation in the area. Response times to the community from Craig and Maybell will vary from 90-120 minutes and 60-90 minutes respectively.

Structural

Driveway access locations and structures have been mapped and identified on Figure 5.2 and should significantly improve timing for locating structures in an emergency.

Inventory of fire protection resources

The Maybell Fire Department has equipment available (see Appendix A) for wildland and structure fires. Ponds are available on the Burton property and Raftopoulos' have a 6,000-gallon tank. The Maybell tender can be used to fill ponds.

Emergency contact information

There are no landlines in Greystone. Cell phone service is spotty (unreliable) and sometimes is routed through a cell tower in Wyoming. Cell phones read as unavailable when a call is made to State Patrol Dispatch. Many cell phones in Greystone are the types that do not work without electricity. A new cell phone tower that will be placed one-half mile east of the Ladore RAWS Weather Station along MCR 10 should improve coverage. Appendix I lists contact information for all Greystone landowners.

Mutual aid agreements

The Maybell Volunteer Fire Department is paged out on the EMS. An Annual Fire Operating Plan (AOP) has been developed in Moffat County for the purpose setting forth standard operating procedures, policies, and responsibilities for implementing cooperative wildfire protection on all lands within the county. Participants in the AOP include the Moffat County Sheriff, Moffat County Board of County Commissioners, USFS—Hahns Peak District, BLM—

Craig Field Office, BLM—Meeker Field Office, NPS—Dinosaur National Monument, USFWS—Browns Park National Wildlife Refuge, and the Colorado State Forest Service. The AOP is contained in Appendix C.

Recommendations for Improving Emergency Preparedness

Improved Access

Landowner contact information, gate/access combinations, alternative contact persons and permission for wildland firefighter access onto private property should be put in writing and available to Dispatch (BLM and State Patrol). Several parcels in the community do not have adequate driveway widths, turnaround space, or defensible space around structures to provide safe access for firefighters. Appendix B provides information and recommendations for driveway specifications and defensible space around homes or cabins. Landowners are encouraged to utilize this information to reduce structural vulnerability and improve safety for both firefighters and homeowners.

Telephone Tree

A standard protocol should be established detailing what information should be given to Dispatch in an emergency

Fire Fighting Equipment and Training

A fire cache should be established and residents should be trained to use the equipment in the event of a wildfire. The residents of Greystone largely support the establishment of a volunteer fire department. In addition, a fire station could be located near Greystone that would jointly service the volunteer fire department, Browns Park/Highway 318 area and BLM and could also serve as a community center. The fire station could house a resident sheriff's deputy, BLM fire crews in the summer, a structure truck, and other wildland fire fighting equipment (the Recreation and Public Services Act allows the BLM to deed land for a public purpose or someone might donate private property for the facility). BLM has identified a potential location for a fire station on public land (See Figure 5.2).

Water

A cistern specifically dedicated for fire fighting would serve as a reliable and easily accessible water source. Tobins are willing to have a tank put on their property. Agreements will need to be established for the use of water during a fire.

Evacuation Plan

Moffat County should develop an evacuation plan for the community. Several elements identified in this plan, including ingress and egress to the community, roads within the community, individual driveways, and high risk fuel areas, will be essential in the development of an evacuation plan.



Legend

-  BLM
-  Community Boundary
-  Private Parcels
-  County Roads
-  Driveways

Figure 5.1



Greystone
 Land Ownership & Cadastral Boundaries
 Moffat County Fire Plan
 ResourcesLogic, LLC 2004



Figure 5.2

Greystone Pre-Emergency Planning

- Legend**
- SLV Property
 - Utility Zone
 - Ingress/Egress
 - SLV Mitigation
 - Utility Water Service
 - Fences
 - Potential Fire Station
 - Emergency Water Source
 - Community Boundary
 - Hazardous Site
 - SLV Property
 - Driveways



Data Source: 2024 Qualified Design, Inc. (QDI), 2024 QDI, Morfol County Assessment, LLC, LDCS DCM, and HCCZ. Imagery-derived data (roads, utility zones and structures).



- Legend**
- Structures
 - Safety Zone
 - Parcel
 - Fire-Factors
 - GUV Mitigation
 - Visible Water Body
 - Community Boundary
 - GUV Priority
 - Priority Mitigation
 - Emergency Water Source
 - County Roads
 - Timber
 - Potential Fire Station
 - Driveways
 - Brush/Grub
 - Mapping Area
 - Hazardous Slope

Figure 5.3



Data Source: 2004 QuickViewmaps, E.M. Smith
 GIS: Moffat County website's Web Link 2004 and
 MDC's imagery-derived data (Beds, Safety Zones and Structures)

Greystone Priority Mitigation

Moffat County Fire Plan
 ResourceLogic, LLC 2004

Appendix A – Community Informational Letter (a similar letter was sent to landowners in Bakers Peak, Knez Divide and Greystone) and Community Meeting Notes.

September 18, 2004

Dear Wilderness Ranch Landowner,

Moffat County recently received a grant from the Bureau of Land Management to develop a mitigation plan for reducing risk to private property, cabins and to lives in the event of wildfire in the Wilderness Ranch Community. Our local consulting firm, *ResourceLogic, L.L.C.*, has been contracted by the County to work with you, other landowners, and the local fire management agencies to create a wildfire mitigation plan for the Wilderness Ranch community.

Your ideas and input will be important in the formation of *pre-emergency plans* and *fuel reduction plans* as they apply to you and to the community as a whole. To develop recommendations for reducing the risks of wildfire and for improving emergency response, the following information will need to be gathered:

- Identify water sources, landing zones, and safety zones/staging areas to improve response to fire or other emergencies within the community.
- Address the need for lot number signs at driveway entrances to facilitate response to emergencies. Moffat County is currently installing signs for CR 38 and new county road address signs for Wilderness Ranch to reduce confusion and improve response time for firefighters and other emergency responders.
- Work with the U.S. Forest Service to plan for reduction of fuels and for fire breaks on adjacent public lands to reduce the risk of wildland fires in Wilderness Ranch.
- Evaluate emergency contact and evacuation procedures, such as a *reverse -911* system or other methods, to notify residents when fire or emergency situations occur.
- Map vegetation types in order to assess hazardous fuels, to rate fire risk in different areas of the community, and to recommend methods for reducing the risks of wildfire.

We realize that private landowners are responsible for protecting their own properties and for allowing access for emergency responders. Unfortunately, narrow driveways, insufficient turn-around space, and lack of “defensible space” around cabins often present challenges to emergency personnel when they are responding to emergencies. The Colorado State Forest Service (www.firewise.org/co) is an excellent source of information to help address these issues. Another information resource that enables you to assess fire risks on your property by filling out an interactive questionnaire is available at www.southwestcoloradofires.org/prevention/assess3.asp.

If you have information regarding the bulleted items listed above, or if you have any other ideas, comments, or questions, please feel free to contact us. We can be reached as follows:

Dale Thompson, Project Manager— 970-824-4117 (home), 970-629-9979 (cell), or e-mail: thomtrm@mindspring.com

Ann Franklin, Consultant — 970-878-4180 (home) or e-mail: baileyann@earthlink.net

Sincerely,

Dale Thompson
ResourceLogic, LLC

cc: Moffat County Board of Commissioners
Ann Franklin

Knez Divide Community Meeting Notes
October 13, 2004
Shadow Mountain Clubhouse

The meeting was held to provide Knez Divide landowners an update on the mitigation planning effort for the community and to seek input from landowners.

Participants included:

Mark Voloshin-landowner
Edith Martin-landowner
Marion Kagie-landowner
Peacock-landowner
Lynn Barclay and Cliff Hutton-BLM
Tim Jantz and Skip Duncan-Sheriff's Dept.
Jeff Comstock-Moffat County Natural Resources
Dale Thompson and Ann Franklin-ResourceLogic

Pre-Emergency planning needs

- Reliable water sources and locations
- Driveway identification
- Defensible space around homes and adequate turnaround space for firefighters
- Adjacent gas plant and gas lines that cross the community
- MCR 206 not signed—currently named Highland Drive on the east side and Meadow Lane on the west side—could be confusing for firefighters.
- Identification of safety zones and staging areas.

Fuel reduction mitigation

- Potential fuel breaks that would reduce fire risk in the community
- Protection for major transmission lines

Wilderness Ranch Community Meeting Notes
October 9, 2004
Holiday Inn, Craig, CO

The Wilderness Ranch Landowners Association held a Board of Directors meeting in Craig on October 9, 2004. The meeting provided a good opportunity to provide information to as many landowners as possible since 70 percent of parcels are absentee ownership.

Dale Thompson (ResourceLogic) and Kent Foster (USFS) provided an update of fire mitigation planning efforts, answered questions, and encouraged comments and input from the WR Board and landowners. Kent Foster also discussed the USFS planning effort to reduce Pine Beetle infestations on public lands south of Wilderness Ranch. Thinning beetle killed trees and trees with the potential to be targeted by beetles would be the most effective fuel reduction method which will help reduce fire risk on Wilderness Ranch.

Pre-Emergency planning needs:

- Identify reliable water sources and locations
- Map driveway locations and provide parcel numbers
- Defensible space around homes and adequate turnaround space for firefighters.
- Identification of safety zones and staging areas.
- Emergency contact information for landowners including names, parcel numbers, and phone numbers.

Fuel reduction mitigation

- USFS fuel reduction plans
- County road rights-of-way clearing/mowing
- Other fuel reduction recommendations in the community
- Landowner focus on reducing high risk fuel types such as spruce/fir and oak brush and work with the State Forest Service to protect structures.

Bakers Peak Community Meeting Notes
September 5, 2004-
Bakers Peak Landowners Assoc.—Bakers Peak

ResourceLogic met with several members of the BPLA and landowners to discuss the community wildfire mitigation planning effort for Bakers Peak. Landowners attending included Don Grooms, Dick and Fran Williamson, Dave Fink, and Roger Davis.

Issues discussed included:

- The need for information on water sources, roads, safety zones/staging areas, and other information that would help firefighters respond to emergencies.
- Landowners expressed the need to maintain historic road names and landmarks commonly known to BP landowners to improve response times and communications with the Sheriff's Dept.
- Landowners are very concerned about the north access to Bakers Peak being closed due to disputes with adjacent landowners.
- Re-establishment of the east access State Land Board and BLM lands.
- Informed landowners about Firewise information available from the State Forest Service for providing defensible space around cabins and meeting driveway standards and turnaround space to insure safety for firefighters and landowners in a wildfire situation.
- Identification of landowner tract numbers and associated landowner names and addresses.
- Emergency contact information.
- Request for input and comments from all BP landowners for wildfire mitigation planning.

Greystone Community Meetings Notes
July 29, 2004
Maybell Community Center

Pre-Emergency Planning –

Communication:

- There are no land lines in Greystone
- Cell phone service is spotty (unreliable); sometimes the communication is with a tower in Wyoming
- Cell phones read as unavailable when someone calls Dispatch
- Many of the cell phones in Greystone are the type that do not work without electricity
- A phone tree might be a good idea in an emergency
- A standard protocol should be followed/established detailing what information to say to Dispatch in the event of an emergency

Fire Services:

- Maybell is paged out on the EMS
- Maybell Volunteer Fire Department has a good list of equipment that is available for wildland and structure fires (water tender, 1000 gallon portable tank, 3200 gallon pumper, 2-inch pumps, a BLM heavy truck, a tanker truck, a structure truck, and a 1300 gallon tank)

Cooperative Fire Protection:

- Fire training and equipment should be available to landowners with a central cache
- Many people liked the idea of establishing a volunteer fire department which would be able to lend support towards a fire station – need support from landowners in the form of letters, community meetings, etc. – the fire station would service more than just Greystone, rather, the entire Browns Park and Hwy 318 area
- An engine barn/station could be built to house a resident deputy, BLM summer fire crews, a structure truck, etc.
- The Recreation and Public Services Act allows the BLM to deed land for a public purpose
- Someone might be willing to donate private property for the facility

Water Sources:

- A cistern that is dedicated specifically for fire fighting would be a very good idea (10,000 Gal. preferable for BLM) – there are not any reliable or easily accessible water sources
- There are many ponds available for dip sites including those on the Burton property and Raftopoulos has a tank that can be used as well.
- Tobins are willing to have a tank on their property
- Agreements need to be established for the use of water during a fire
- The Maybell tender can be used to fill trucks or tanks.

Private Property Access:

- Contact information, gate access/combinations, alternative contact person and permission for BLM/Sheriff to access onto property should be in writing and available at Dispatch
- Important for driveways to have sufficient width to allow ingress, turnarounds, and egress for fire fighting equipment

Fuel Break –

- Could be designed to work with any existing fuel breaks or plan around landowners not wishing to participate
- Recommendations are for a shaded fuel break, i.e. 100-120 ft. width with 20-30 ft. spacing between trees. The fuel break could be developed by mechanical treatment or hand thinning.
- Road should be extended on the BLM behind the Churchill, Tamlin, and Burton properties on the south side of Greystone
- The sagebrush is very thick on the east side of Greystone and a fuel break should be established there in addition to the fuel break on the western and southern sides

Grants/Funding—

- The grant Moffat County received for fuel reduction for the Greystone Community has a landowner cost share component. Participation by landowners on private property is all voluntary. Participation can include in-kind contributions (credits), i.e. labor and equipment used for reducing fuel hazards, past and future
- Clyde Anderson, Moffat County Sheriff's Dept., advised that grants are available for volunteer fire dept. fire houses

Appendix A

Appendix B – Homeowner Information—Driveway Standards and Defensible Zone/Space Recommendations

no. 6.302

Creating Wildfire-Defensible Zones

by F.C. Dennis ¹

Quick Facts...

- Wildfire will find the weakest links in the defense measures you have taken on your property.
- The primary determinants of a home's ability to survive wildfire are its roofing material and the quality of the "defensible space" surrounding it.
- Even small steps to protect your home and property will make them more able to withstand fire.
- Consider these measures for all areas of your property, not just the immediate vicinity of the house.

Fire is capricious. It can find the weak link in your home's fire protection scheme and gain the upper hand because of a small, overlooked or seemingly inconsequential factor. While you may not be able to accomplish all measures below (and there are no guarantees), each will increase your home's, and possibly your family's, safety and survival during a wildfire.

Start with the easiest and least expensive actions. Begin your work closest to your house and move outward. Keep working on the more difficult items until you have completed your entire project.

Defensible Space

Two factors have emerged as the primary determinants of a home's ability to survive wildfire. These are the home's roofing material and the quality of the "defensible space" surrounding it.

Use fire-resistive materials (Class C or better rating), not wood or shake shingles, to roof homes in or near forests and grasslands. When your roof needs significant repairs or replacement, do so with a fire-resistant roofing material. Check with your county building department. Some counties now restrict wood roofs or require specific classifications of roofing material.

Defensible space is an area around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards the structure. It also reduces the chance of a structure fire moving from the building to the surrounding forest. Defensible space provides room for firefighters to do their jobs. Your house is more likely to withstand a wildfire if grasses, brush, trees and other common forest fuels are managed to reduce a fire's intensity.

The measure of fuel hazard refers to its continuity, both horizontal (across the ground) and vertical (from the ground up into the vegetation crown). Fuels with a high degree of both vertical and horizontal continuity are the most hazardous, particularly when they occur on slopes. Heavier fuels (brush and trees) are more hazardous (i.e. produce a more intense fire) than light fuels such as grass.

Mitigation of wildfire hazards focuses on breaking up the continuity of horizontal and vertical fuels. Additional distance between fuels is required on slopes.

Creating an effective defensible space involves developing a series of management zones in which different treatment techniques are used. See Figure 1 for a general view of the relationships among these management zones. Develop defensible space around each building on your property. Include detached garages, storage buildings, barns and other structures in your plan.

The actual design and development of your defensible space depends on several factors: size and shape of buildings, materials used in their construction, the slope of the ground on which the structures are built, surrounding topography, and sizes and types of vegetation on your property. These factors all affect your design. You may want to request additional guidance from your local Colorado State Forest Service (CSFS) forester or fire department. (See the Special Recommendations section of this fact sheet for shrubs, lodgepole pine, Engelmann spruce, and aspen.)

Defensible Space Management Zones

Zone 1 is the area of maximum modification and treatment. It consists of an area of 15 feet around the structure in which all flammable vegetation is removed. This 15 feet is measured from the outside edge of the home's eaves and any attached structures, such as decks.

Zone 2 is an area of fuel reduction. It is a transitional area between Zones 1 and 3. The size of Zone 2 depends on the slope of the ground where the structure is built. Typically, the defensible space should extend at least 75 to 125 feet from the structure. See Figure 2 for the appropriate distance for your home's defensible space. Within this zone, the continuity and arrangement of vegetation is modified. Remove stressed, diseased, dead or dying trees and shrubs. Thin and prune the remaining larger trees and shrubs. Be sure to extend thinning along either side of your driveway all the way to your main access road. These actions help eliminate the continuous fuel surrounding a structure while enhancing homesite safety and the aesthetics of the property.

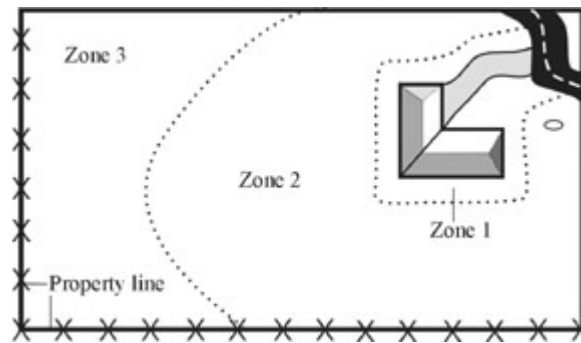


Figure 1: Forested property showing the three fire-defensible zones around a home or other structure.

Zone 3 is an area of traditional forest management and is of no particular size. It extends from the edge of your defensible space to your property boundaries.

Prescriptions

Zone 1

The size of Zone 1 is 15 feet, measured from the edges of the structure. Within this zone, several specific treatments are recommended.

Plant nothing within 3 to 5 feet of the structure, particularly if the building is sided with wood, logs or other flammable materials. Decorative rock, for example, creates an attractive, easily maintained, nonflammable ground cover.

If the house has noncombustible siding, widely spaced foundation plantings of low growing shrubs or other “fire wise” plants are acceptable. Do not plant directly beneath windows or next to foundation vents. Be sure there are no areas of continuous grass adjacent to plantings in this area.

Frequently prune and maintain plants in this zone to ensure vigorous growth and a low growth habit. Remove dead branches, stems and leaves.

Do not store firewood or other combustible materials in this area. Enclose or screen decks with metal screening. Extend the gravel coverage under the decks. Do not use areas under decks for storage.

Ideally, remove all trees from Zone 1 to reduce fire hazards. If you do keep a tree, consider it part of the structure and extend the distance of the entire defensible space accordingly. Isolate the tree from any other surrounding trees. Prune it to at least 10 feet above the ground. Remove any branches that interfere with the roof or are within 10 feet of the chimney. Remove all “ladder fuels” from beneath the tree. Ladder fuels are vegetation with vertical continuity that allows fire to burn from ground level up into the branches and crowns of trees. Ladder fuels are potentially very hazardous but are easy to mitigate. No ladder fuels can be allowed under tree canopies. In all other areas, prune all branches of shrubs or trees up to a height of 10 feet above ground (or 1/2 the height, whichever is the least).

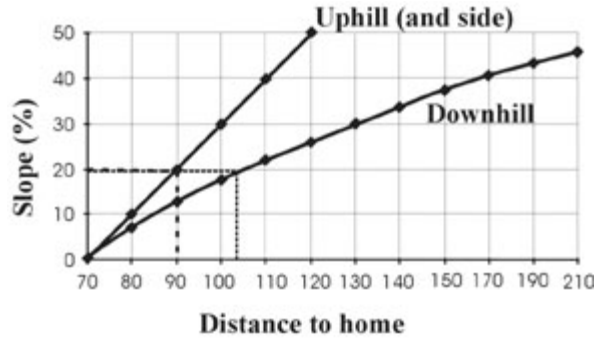


Figure 2: This chart indicates the minimum recommended dimensions for defensible space from the home to the outer edge of Zone 2. For example, if your home is situated on a 20 percent slope, the minimum defensible space dimensions would be 90 feet uphill and to the sides of the home and 104 feet downhill from the home.

Zone 2

Zone 2 is an area of fuel reduction designed to reduce the intensity of any fire approaching your home. Follow these recommended management steps.

Thin trees and large shrubs so there is at least 10 feet between crowns. Crown separation is measured from the furthest branch of one tree to the nearest branch on the next tree (Figure 3). On steep slopes, allow more space between tree crowns. (See Figure 4 for minimum recommended spacing for trees on steep slopes.) Remove all ladder fuels from under these remaining trees. Carefully prune trees to a height of at least 10 feet.

Small clumps of 2 to 3 trees may be occasionally left in Zone 2. Leave more space between the crowns of these clumps and surrounding trees.

Because Zone 2 forms an aesthetic buffer and provides a transition between zones, it is necessary to blend the requirements for Zones 1 and 3. Thin the portions of Zone 3 adjacent to Zone 2 more heavily than the outer portions.

Isolated shrubs may remain, provided they are not under tree crowns. Prune and maintain these plants periodically to maintain vigorous growth. Remove dead stems from trees and shrubs annually. Where shrubs are the primary fuel in Zone 2, refer to the Special Recommendations section of this fact sheet.

Limit the number of dead trees (snags) retained in this area. Wildlife needs only one or two snags per acre. Be sure any snags left for wildlife cannot fall onto the house or block access roads or driveways.

Mow grasses (or remove them with a weed trimmer) as needed through the growing season to keep them low, a maximum of 6 to 8 inches. This is extremely critical in the fall when grasses dry out and cure or in the spring after the snow is gone but before the plants green up.

Stack firewood and woodpiles uphill or on the same elevation as the structure but at least 30 feet away. Clear and keep away flammable vegetation within 10 feet of these woodpiles. Do not stack wood against your house or on or under your deck, even in winter. Many homes have burned from a woodpile that ignited as the fire passed. Wildfires can burn at almost any time in Colorado.

Locate propane tanks at least 30 feet from any structures, preferably on the same elevation as the house. You don't want the LP container below your house — if it ignites, the fire would tend to burn uphill. On the other hand, if the tank is above your house and it develops a leak, LP gas will flow downhill into your home. Clear and keep away flammable vegetation within 10 feet of these tanks. Do not screen propane tanks with shrubs or vegetation.

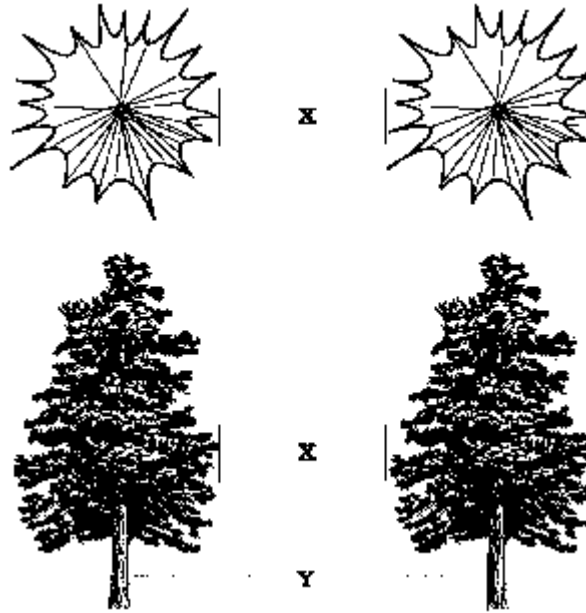


Figure 3: X = crown spacing; Y = stem spacing. Do not measure between stems for crown -- measure between the edges of tree crowns.

Figure 4: Minimum tree crown and shrub clump spacing.

Appendix B

% slope	Tree Crown Spacing	Brush and Shrub Clump Spacing
0 -10 %	10 ´	2 1/2 x shrub height
11 - 20%	15 ´	3 x shrub height
21 - 40%	20 ´	4 x shrub height
> 40%	30 ´	6 x shrub height

Dispose of slash (limbs, branches and other woody debris) from your trees and shrubs through chipping or by piling and burning. Contact your local CSFS office or county sheriff's office for information about burning slash piles. If neither of these alternatives is possible, lop and scatter slash by cutting it into very small pieces and distributing it over the ground. Avoid heavy accumulations of slash. Lay it close to the ground to speed decomposition. If desired, no more than two or three small, widely spaced brush piles may be left for wildlife purposes. Locate these towards the outer portions of your defensible space.

Zone 3

This zone is of no specified size. It extends from the edge of your defensible space to your property lines. A gradual transition into this zone from defensible space standards to other management objectives you may have is suggested. Typical management objectives for areas surrounding homesites or subdivisions are: provide optimum recreational opportunities; enhance aesthetics; maintain tree health and vigor; provide barriers for wind, noise, dust and visual intrusions; support limited production of firewood, fence posts and other forest commodities; or grow Christmas trees or trees for transplanting.

Figure 5: Minimum tree spacing for Zone 3.

Tree Diameter (in inches)	Average Stem Spacing Between Trees (in inches)
3	10
4	11
5	12
6	13
7	14
8	15
9	16
10	17
11	19
12	21
13	23
14	24
15	26

Appendix B

16	28
17	29
18	31
19	33
20	35
21	36
22	38
23	40
24	42

Specific requirements will be dictated by your objectives for your land and the kinds of trees present. See Figure 5 for the minimum suggested spacing between “leave” trees. Forest management in Zone 3 is an opportunity for you to increase the health and growth rate of the forest in this zone. Keep in mind that root competition for available moisture limits tree growth and ultimately the health of the forest.

A high canopy forest reduces the chance of a surface fire climbing into the tops of the trees and might be a priority for you if this zone slopes steeply. The healthiest forest is one that has multiple ages, sizes, and species of trees where adequate growing room is maintained over time. Remember to consider the hazards of ladder fuels. Multiple sizes and ages of trees might increase the fire hazard from Zone 3 into Zone 2, particularly on steep slopes.

A greater number of wildlife trees can remain in Zone 3. Make sure that dead trees pose no threat to power lines or fire access roads.

While pruning generally is not necessary in Zone 3, it may be a good idea from the standpoint of personal safety to prune trees along trails and fire access roads. Or, if you prefer the aesthetics of a well-manicured forest, you might prune the entire area. In any case, pruning helps reduce ladder fuels within the tree stand, thus enhancing wildfire safety.

Mowing is not necessary in Zone 3.

Any approved method of slash treatment is acceptable for this zone, including piling and burning, chipping or lop-and-scatter.

Special Recommendations

Tree spacing guidelines do not apply to mature stands of aspen trees where the recommendations for ladder fuels have been complied with. In areas of aspen regeneration and young trees, the spacing guidelines should be followed.

Brush and shrubs

Brush and shrubs are woody plants, smaller than trees, often formed by a number of vertical or semi-upright branches arising close to the ground. Brush is smaller than shrubs and can be either woody or herbaceous vegetation.

On nearly level ground, minimum spacing recommendations between clumps of brush and/or shrubs is 2 1/2 times the height of the vegetation. Maximum diameter of clumps should be 2 times the height of the vegetation. As with tree crown spacing, all measurements are made from the edges of vegetation crowns (Figure 3).

For example: For shrubs 6 feet high, spacing between shrub clumps should be 15 feet or more apart (measured from the edges of the crowns of vegetation clumps). The diameter

of shrub clumps should not exceed 12 feet (measured from the edges of the crowns). Branches should be pruned to a height of 3 feet.

Grasses

Keep dead, dry or curing grasses mowed to less than 6 inches. Defensible space size where grass is the predominant fuel can be reduced (Figure 5) when applying this practice.

Windthrow

In Colorado, certain locations and tree species, including lodgepole pine and Engelmann spruce, are especially susceptible to damage and uprooting by high winds (windthrow). If you see evidence of this problem in or near your forest, or have these tree species, consider the following adjustments to the defensible space guidelines. It is highly recommended that you contact a professional forester to help design your defensible space.

Adjustments: If your trees or homesite are susceptible to windthrow and the trees have never been thinned, use a stem spacing of diameter plus five instead of the guides listed in the Zone 3 section. Over time (every 3 to 5 years) gradually remove additional trees. The time between cutting cycles allows trees to “firm up” by expanding their root systems. Continue this periodic thinning until the desired spacing is reached.

Also consider leaving small clumps of trees and creating small openings on their lee side (opposite of the predominant wind direction). Again, a professional forester can help you design the best situation for your specific homesite and tree species. Remember, with species such as lodgepole pine and Engelmann spruce, the likelihood of a wildfire running through the tree tops or crowns (crowning) is closely related to the overabundance of fuels on the forest floor. Be sure to remove downed logs, branches and excess brush and needle buildup.

Figure 6: Minimum defensible space size for grass fuels.	
% slope	D-space size (uphill, downhill, sidehill)
0 - 20 %	30'
21 - 40%	50'
> 40%	70'

Maintaining Your Defensible Space

Your home is located in a forest that is dynamic, always changing. Trees and shrubs continue to grow, plants die or are damaged, new plants begin to grow, and plants drop their leaves and needles. Like other parts of your home, defensible space requires maintenance. Use the following checklist each year to determine if additional work or maintenance is necessary.

Defensible Space and FireWise Annual Checklist

- Trees and shrubs are properly thinned and pruned within the defensible space. Slash from the thinning is disposed of.
- Roof and gutters are clear of debris.
- Branches overhanging the roof and chimney are removed.

Appendix B

- Chimney screens are in place and in good condition.
- Grass and weeds are mowed to a low height.
- An outdoor water supply is available, complete with a hose and nozzle that can reach all parts of the house.
- Fire extinguishers are checked and in working condition.
- The driveway is wide enough. The clearance of trees and branches is adequate for fire and emergency equipment. (Check with your local fire department.)
- Road signs and your name and house number are posted and easily visible.
- There is an easily accessible tool storage area with rakes, hoes, axes and shovels for use in case of fire.
- You have practiced family fire drills and your fire evacuation plan.
- Your escape routes, meeting points and other details are known and understood by all family members.
- Attic, roof, eaves and foundation vents are screened and in good condition. Stilt foundations and decks are enclosed, screened or walled up.
- Trash and debris accumulations are removed from the defensible space.
- A checklist for fire safety needs inside the home also has been completed. This is available from your local fire department.

References

Colorado State Forest Service, Colorado State University, Fort Collins, CO 80523-5060; (970) 491-6303:

- *FireWise Construction -- Design and Materials*
- *Home Fire Protection in the Wildland Urban Interface*
- *Wildfire Protection in the Wildland Urban Interface*
- *Landowner Guide to Thinning*

Colorado State University Cooperative Extension, 115 General Services Bldg., Fort Collins, CO 80523-4061; (970) 491-6198; Fax (970) 491-2961; E-mail cerc1@ur.colostate.edu.

- 6.303, [Fire-Resistant Landscaping](#)
- 6.304, [Forest Home Fire Safety](#)
- 6.305, [FireWise Plant Materials](#)
- 6.306, [Grass Seed Mixes to Reduce Wildfire Hazard](#)
- 7.205, [Pruning Evergreens](#)
- 7.206, [Pruning Shrubs](#)
- 7.207, [Pruning Deciduous Trees](#)

¹Wildfire Hazard Mitigation Coordinator, Colorado State Forest Service. This fact sheet was produced in cooperation with the Colorado State Forest Service. FIREWISE is a multi-agency program that encourages the development of defensible space and the prevention of catastrophic wildfire. 4/03.

Driveway Standards

Source: <http://www.firewise.org/co/>

Note: the following are general standards for driveways. Ensure that your driveway and signage complies with local regulations. Because your local fire department may have special equipment, please check with your **fire chief** for other specifics.



Driveway Standards

During a wildfire, firefighters will not drive their engine into your driveway if they feel it is unsafe for them to do so. What makes a safe driveway? Basically it is the same as defensible space around your home: Clearing and thinning vegetation from the roadway both horizontally and vertically, as well as providing a turnaround big enough for the engine, and turnouts to provide room for other vehicles to pass by safely.

Width of driveway: The all weather surface should be at least 12 ft. wide.

Vertical clearance: Engines and the equipment on them are tall. Prune tree branches to provide at least 15 ft. of clearance.

Turnaround: A turnaround near your house should be provided with at least a 50 ft. radius. A "Hammerhead - T" with a minimum of 60 ft. across the top, is an alternative.

Turnouts: A turnout is a wide place in your driveway that will allow another vehicle (or fire engine) to pass. It should be at least 10 ft. wide and 30 ft. long. If your driveway is over 400 ft. long, a turnout should be provided at least every 400 ft.

Other considerations:

Grade: Your driveway should not exceed 15% grade. Avoid a sharp change in grade.

Intersection: Where your driveway intersects the main road, the intersection should be as close to a 90 degree T as possible to facilitate turns from both directions. Is it signed?

Bridges & Culverts: Water hauling tenders are heavy (some in excess of 80,000 lbs.). Sign the rated capacity of your bridges & culverts.

Pipe crossings, Septic tanks & leach fields: These can collapse under a heavy engine, trapping it. Be sure you have signs ready to put up designating these hazards if you have to evacuate.



How do I determine slope? 

Ask your fire department for a driveway FireWise safety review!



Appendix C – Mutual Aid Agreements—Annual Fire Operating Plan for Moffat County

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I. PLAN APPROVALS

This plan will remain in effect until superseded by following years. Participating agencies will meet prior to fire season each year to review and update this plan for official approval.

Agencies approving the continuation of this agreement through May 1, 2005:

_____	_____	_____
Moffat County Commissioners	Date	
_____	_____	_____
Moffat County Sheriff	Date	
_____	_____	_____
CSFS District Forester	Date	
_____	_____	_____
Forest Supervisor, Medicine Bow-Routt NF	Date	
_____	_____	_____
Little Snake Field Office Manager	Date	
_____	_____	_____
Superintendent, Dinosaur National Monument	Date	
_____	_____	_____
Manager, Browns Park National Wildlife Refuge	Date	

II. JURISDICTIONS

Jurisdictional boundary lines for USFS, BLM, NPS, and Moffat County (private and state) lands are as shown on the BLM (1/2" = 1 mile) map.

III. AUTHORITY

*** This plan fulfills requirements in the latest Interagency Cooperative Fire Agreement between the State of Colorado and the USDA Forest Service, USDI National Park Service, Bureau of Land Management, Bureau of Indian Affairs, and Fish and Wildlife Service.

This plan fulfills Article I.2. of the Emergency Fund Contract for Forest and Watershed Fire Control between the State of Colorado and Moffat County and becomes Attachment B of that agreement. ***

IV. PURPOSE

The purpose of this Annual Fire Operating Plan (AOP) is to set forth standard operating procedures, agreed upon policies, and responsibilities to implement cooperative wildfire protection on all lands within Moffat County.

Participants in this AOP consist of the following:

Moffat County Sheriff, in behalf of the County and FPD's
Moffat County Board of County Commissioners
Hahns Peak District of the Medicine Bow-Routt NF (USFS)
Craig Field Office of the Bureau of Land Management (BLM)
Meeker Field Office of the BLM
Dinosaur National Monument (NPS)
Browns Park National Wildlife Refuge (BPR)
Colorado State Forest Service (CSFS)

All participants of this plan agree to coordinate their wildfire protection activities as outlined herein.

V. DEFINITIONS AND DESCRIPTIONS OF:

A. FIRE PROTECTION RESPONSIBILITIES

Each jurisdictional agency has ultimate responsibility for wildland fire protection on its own lands. The Sheriff is responsible for fire protection on all non-federal lands in Moffat County, not incorporated in a fire protection district.

B. MUTUAL AID DISPATCH AREAS BY DISPATCH LEVEL

All dispatches will be made based on the closest forces capable of responding to the incident.

C. MUTUAL AID MOVE-UP AND COVER FACILITIES

Move-up and cover facilities have not been predetermined.

D. SPECIAL MANAGEMENT CONSIDERATIONS

Suppression within designated Wilderness, Wilderness Study Areas, and/or "roadless" areas, or Appropriate Management Response(AMR)area as designated on the map, will not be conducted without direct orders from the jurisdictional federal official.

Use of mechanized equipment such as bulldozers, graders, etc., will not be permitted on federal lands without the expressed approval of the appropriate federal official.

Moffat County will implement their fire management plan for the 2003 fire season.

Additionally, however, the jurisdictional agency will keep other responding agencies informed of the status of its investigations and legal actions.

E. RESPONSIBILITY FOR NON-WILDLAND FIRE EMERGENCIES

This plan addresses only wildland fire incidents.

F. REPAIR OF WILDFIRE SUPPRESSION DAMAGE

Repair of wildfire suppression damage is the responsibility of the jurisdictional agency, unless otherwise agreed to by the unified command at the time of fire close out.

VI. RESOURCE LIST

County Equipment

Graders

1-Maybell

1-Browns Park

1-Great Divide

1-Hamilton

Dozers

1-D6 Craig Type 2

1-TD-25 Craig Type 1

1-D8 Craig Type 1

Other Equipment

3-Craig Truck with lowboy
1-4Mile (Baggs) 2-4000 gal water trucks (not potable)

Maybell VFD

1-2 1/2T 6x6 engine 1000gal. Type 3X (Moffat County engine 1)
Type 6X (Sheriffs Dept.)
1- 500 gal. collapsible portable water tank
1- 500 gal. high volume pumper truck Type 2

Artesia FPD

Equipment

1 1T Type 6x
3-3/4T 4x4 210gal Type 6X
2- 500gal Type 2X,2
1-1T 4x4 300gal Type 5X

Craig Rural FPD

Equipment

4 - 150 gal fast attack 4x4 Type 7X
1 - 500 gal structure engine 4x2 Type 2
1 - 400 gal 4x4 Type 6X

Moffat County Sheriffs Dept.

Equipment

3-2 1/2T 6x6 engines 1000 gal - Craig 3X (Moffat County engines 2,5 & 6)
1-2 1/2T 6x6 engine 1000 gal - CAF engine - Craig Type 3X (Moffat County engine 3)
1- 500 gal collapsible portable water tank
1-Incident command vehicle
1-1T 4x4 engine 200 gal. type 6x (Moffat County engine 4)

Northwest Colorado Fire Management Unit - Craig Station

3 - Type 6 Engines (2-Craig, 1-Meeker)
4 - Type 4 Engines (3-Craig, 1-Meeker)
1 - Type 1 tender

Steamboat Station

5 person initial attack squad

Dinosaur National Monument

2- Type 6 Engines (Engines 681 & 683)

U.S. Fish and Wildlife Service - Browns Park

1- grader

1- D4 dozer without transport

1 -Type 6x engine (#6414)

_____ 1- Type 3 tender (#WT3411)_

1- 800 gal. portable tank

Aircraft

Requests for air support must include (i) name of individual acting as ground contact(identified by Craig Interagency Dispatch Center (CRC)) (ii) radio frequency for ground contact (identified by CRC)(iii) nearest base of operations. (See EXHIBIT A for map of radio frequencies)

Grand Junction Air Center, Grand Junction

1-Type 3 "light" Helicopter

Fort Collins

(contact thru Craig Dispatch Center 826-5037)

_____ 1-Type 3 "light" Helicopter

Northwest Colorado Fire Management Unit-Craig

1-300 gal. Thrush SEAT N# 7943V Tanker 443 (CWN)

Colorado State Forest Service

1 to 4 Single Engine Air Tankers

2-UHY Helicopters w/200 gal. buckets (These are Colo. Nat. Guard ships located at the High Altitude Training Site in Eagle)

VII. PROTECTION AREA MAP

The BLM map,(1/2"= 1 mile) is used to show jurisdictional boundaries for the purpose of this plan. The Moffat County Sheriff is responsible for fire control on

all state and private lands within Moffat County. On federal lands, the agency charged with managing those lands is responsible for fire control.

VIII. FIRE READINESS

A. FIRE PLANNING

This AOP is the only example of an interagency fire plan in use for Moffat County.

B. WILDFIRE TRAINING NEEDS AND COORDINATION

Standard approved fire training courses are provided periodically by CSFS, USFS, BLM, NPS, and other agencies. As these courses are scheduled, all cooperators will be informed and invited to participate. CSFS will attempt to provide specific training opportunities for fire district personnel and other private organizations as requested, and as time allows.

C. INSPECTION SCHEDULES

Equipment will be inspected based on need as determined by the agency responsible for such equipment.

IX. WILDFIRE SUPPRESSION PROCEDURES

A. INCIDENT COMMAND SYSTEM USE

The Incident Command System (ICS) will be utilized on all fires. ICS is a standardized method of managing emergency incidents. It is based on:

- Common organizational structure
- Common terminology
- Common operating procedures
- Known qualifications of emergency personnel

ICS does not infringe on the responsibilities or authority given each agency by statute, but if a transfer of authority is necessary as conditions change, ICS eases the transition since organizational structure and lines of authority are clearly identified.

B. DETECTION

Moffat County Sheriffs Department will receive reports of wildland fires from the public and will notify the applicable agency.

C. MOBILIZATION GUIDES

Craig Dispatch Center maintains a mobilization guide. These guides may be useful to the county for obtaining private sector wildland fire resources.

D. NOTIFICATION OF FIRES

Assisting agencies making initial attack on fires within the mutual aid zone will ensure that the jurisdictional agency is promptly notified of the fire through Craig Dispatch Center. The County Sheriff will be notified of all wildland fires. If the fire is on or threatening state or private land, and is expected to exceed the control capabilities of the county, the CSFS fire duty officer will be notified. If the fire is on land managed by BLM, NPS, Routt National Forest, or U.S. Fish and Wildlife - Moffat County Communications Center will notify Craig Interagency Dispatch Center (CRC). The Division of Wildlife will be notified of all fires burning in state wildlife areas.

E. RECIPROCAL FIRE PROTECTION AREAS

Reciprocal Fire Protection. A reciprocal fire protection zone has been established county-wide between the BLM, USFS, USFWS, NPS and Moffat County. In the event a fire occurs within these zones, it is agreed that there should be no delay in attack pending determination of the precise location of the fire, land ownership or responsibility.

Upon receiving the report of a fire CRC will dispatch initial attack forces and notify jurisdictional agency.

Once ownership has been determined, the responsible agency shall relieve the personnel of the assisting agency at the earliest possible time.

These zones have been established for mutual aid purposes only. Mutual aid period shall mean the period of fire suppression from the time of initial dispatch thru one complete burning period. The mutual aid period may end earlier by mutual agreement.

Each agency will make its personnel and equipment available upon request to the other agencies. It is understood however, that no agency will be required or expected to commit its forces to assisting another agency to the extent of jeopardizing its own responsibilities, or the security of lands it is charged with protecting.

F. INITIAL ATTACK DISPATCH LEVELS

Initial attack dispatch levels are predetermined in Moffat County, and the Sheriff's and County Road and Bridge's resources are included in the low, medium and high levels.

G. DISPATCHING AND RESOURCE ORDER PROCESS

Craig Dispatch Center will act as dispatch for county initial attack response. The agency that can take the quickest effective fire suppression action will be dispatched for initial attack. The jurisdictional agency will assume command of the suppression action at the earliest possible time. Notification of all other agencies that are, or may be affected, is the responsibility of the CRC.

1. MAC GROUP (Multi Agency Coordination)

Local MAC Group: If a fire crosses jurisdictional boundaries and becomes a multi-agency fire, a local MAC Group will be formed. The purpose of the MAC Group will be to meet as a group and identify policies, objectives, and strategy, resulting in one common set of objectives given to a single incident commander for tactical implementation. It will also be the responsibility of the MAC Group to determine cost-sharing for multi-jurisdictional fires.

The MAC Group may consist of:

Moffat County Sheriff's Department: Sheriff
or their designate.

Colorado State Forest Service: District Forester or
their designate.

Medicine Bow - Routt National Forest and the Bureau
of Land Management: Craig/Routt FMO or their designate.
Dinosaur National Monument: Monument Superintendent or
their designate.

Browns Park National Wildlife Refuge: Refuge Manager or
their designate.

2. BOUNDARY FIRES

Boundary fires include (i) a fire burning jointly on two or more agencies lands, or will soon burn across the boundary, when the boundary line is known, (ii) when the fire location is known, but the jurisdictional boundary on the ground is unknown, or (iii) when the location of a reported fire is uncertain in relation to the jurisdictional boundary.

H. REINFORCEMENTS AND SUPPORT

All requests for additional resources beyond initial attack will be made by the applicable agency representative, using appropriate ordering procedures as follows:

-Moffat County Sheriff, Routt National Forest, BLM, NPS and CSFS will order through Craig Interagency Dispatch Center (CRC).

I. MOVE UP AND COVER PROCEDURES

Move up and cover procedures have not been predetermined.

J. INTERAGENCY PROCUREMENT

Non-federal participants in this plan may purchase fire suppression supplies from GSA through CSFS. Any other loaning, sharing, exchanging, or maintenance of facilities, equipment, or support services will be considered on a case by case basis and must be mutually agreed upon by the concerned parties.

K. COMMUNICATIONS SYSTEMS AND FREQUENCIES

The BLM Work Channel will be used for inter-agency communication on wildland fires.

Federal agencies can obtain authority to use this frequency (contact CSFS for details). Agencies with programmable radios should assign FERN I frequency to one channel.

For the purposes of conducting business authorized by this cooperative agreement, all parties to this operating plan agree that assisting agencies may use the jurisdictional agency's radio frequencies as needed to conduct emergency communications on fires of the jurisdictional agency. No party

Appendix C

to this operating plan will use, or authorize others to use, another agency's radio frequencies for routine day to day operations. Fire protection districts on incident management missions, under the auspices of the county, are granted permission to use federal radio frequencies, if needed, to assure safety of the operation. Following are radio frequencies specifically authorized for use:

<u>County Sheriff & FPD's</u>					
	<u>RX</u>	<u>TX</u>	<u>TONE</u>		
Craig Fire (repeater)	154.220	154.430	4B	Craig Fire - direct	
154.220 154.220					
Artesia FPD	154.280	154.220			
<u>Dinosaur National Monument</u>					
	<u>RX</u>	<u>TX</u>	<u>TONE</u>		
Dino NM #1		166.375	166.375		
Dino NM #2		166.375	166.975	110.9	
Dino NM #3		166.375	166.975	114.8	
<u>Colorado State Forest Service</u>					
	<u>RX</u>	<u>TX</u>	<u>TONE</u>		
Car to Car	151.340	151.340			
Natural Resources (Walton)	151.145	159.450	151.4		
<u>USFS-Hahns Peak-Bears Ears District</u>					
	<u>RX</u>	<u>TX</u>	<u>TONE</u>		
Black Mountain	169.600	164.9125	156.7		
Cedar Mountain			169.600	164.9125	167.9
<u>BLM</u>					
	<u>RX</u>	<u>TX</u>	<u>TONE</u>		
BLM Work Channel		168.350	168.350		
CRC Juniper		168.425	168.425	192.8	
Lookout			168.425	169.625	151.4
Cathedral	168.425	169.625	192.8		
<u>Browns Park Wildlife Refuge</u>					
	<u>RX</u>	<u>TX</u>	<u>TONE</u>		
Zenobia Peak			163.3375	162.1625	110.9
Blue Mountain	172.450	171.750	141.3		
Car to Car	163.3375	163.3375	110.9		

L. WILDLAND FIRE SITUATION ANALYSIS

Federal agencies are required to complete a Wildland Fire Situation Analysis (WFSA) on all fires on federal land that escape initial attack. This procedure requires federal agency unit administrator participation.

CSFS requires an Emergency Fire Fund (EFF) Analysis Form (CSFS #108A attached as EXHIBIT B) to be prepared on non-federal fires that have the potential to exceed county control capabilities. The Sheriff should use this form to help determine if a fire might be eligible for EFF.

CSFS will prepare an Escaped Fire Situation Analysis(EFSA) for all fires that are approved for EFF.

On non-EFF fires involving private land the Sheriff and other involved agencies shall develop a Wildland Fire Situation Analysis for extended attack. A Delegation of Authority should also be done from the County to the IC.

M. STATE EMERGENCY FIRE FUND (EFF)

1. INTENT

Moffat County is a member of the State EFF agreement. The purpose of the EFF agreement is to provide funds to cover costs associated with a large fire, or multiple fires on non-federal lands that the resources of the county cannot handle.

When EFF is implemented, CSFS assumes responsibility and authority for all suppression activity until the fire is returned to county responsibility; however, the county must maintain a minimum level of participation after EFF is implemented as outlined in section IX.M.5.b.

2. FUNDING

Money is contributed by member counties annually, based on a CSFS assessment that considers the number of forested acres and valuation of private land.

3. ROLES

a. CSFS DISTRICT FORESTER

Act for State Forester in the absence of an assigned Incident Line Officer; assist Sheriff in completing EFF Analysis Form (CSFS #108A) for each shift; prepare CSFS Fire Funding Request (CSFS #164); assure Incident Line Officer is aware of local situations and procedures.

b. Moffat County SHERIFF

Prepare EFF Analysis Form (CSFS #108A) for potential EFF fires; sign Assumption of Fire Control Duty Form

(CSFS #168) for fires that the State Forester approves for EFF; serve as county representative on Unified Command group.

c. Moffat County COMMISSIONERS

Approve Assumption of Fire Control Duty Form (CSFS #168) for fires that the State Forester approves for EFF.

d. OTHER AGENCIES

Provide Sheriff with personnel and equipment necessary to meet minimum county resource commitment.

4. MAC GROUP

All EFF fires will utilize a MAC Group consisting of, at a minimum, Moffat County Sheriff and CSFS. If land administered by another agency is threatened or involved, that agency will provide a member of the MAC Group as outlined in section IX.G.1.

5. EFF ACTIVATION

Implementation of the Emergency Fire Fund can be done only by the Colorado State Forester upon the recommendation of the local CSFS District Forester, following a request from the county. For this reason, it is important that the CSFS Fire Duty Officer be notified immediately of major fires on private/state lands within the county. Should the fire surpass, or threaten to surpass, the ability of county resources to contain it, EFF implementation can occur only with a CSFS representative on scene.

a. CSFS FORMS

* 108A prepared by Moffat County Sheriff and CSFS District Forester (EXHIBIT B).

* 168 prepared by CSFS District Forester with input from Moffat County Sheriff.

* WFSAs prepared by Incident Line Officer with input from District Forester and Sheriff.

b. COUNTY RESPONSIBILITY

The minimum Moffat County resource commitment for an on going EFF fire is two wildland engines, one structural engine, one water tender, and one maintainer, all with operators. Additionally Moffat County will provide an incident command post and traffic control. It is understood that if the tactics of a given incident do not require some of this equipment, it will not be required on scene.

c. EFF/CSFS RESPONSIBILITY

CSFS will provide a District Representative and an Incident Line Officer for each EFF fire. CSFS will act as the fund administrator for all EFF fires.

6. EFF DEACTIVATION

CSFS will transfer control of an EFF fire back to Moffat County when fire spread is contained, the Line Officer's objectives have been met, and a written plan has been prepared for the next operational period.

a. MOP-UP AND PATROL

The county will be responsible for mop-up and patrol, after control of an EFF fire has been transferred back to the county from CSFS, according to an extended incident action plan.

b. RECLAMATION

The EFF can pay for waterbarring and reseeding control lines. All other reclamation work must be funded by the landowner.

N. DISPATCH CENTERS

Dispatch centers and their areas of responsibility are outlined in section IX.G.

O. POST-INCIDENT ACTION ANALYSIS

Analysis of incidents will be conducted at a level commensurate with the complexity of the incident.

P. OUT-OF-COUNTY ASSIGNMENTS

Red cards are not required for initial attack, but firefighters without red cards will be the first ones released by the jurisdictional agency. In most cases this will occur no later than the next operational period.

X. AVIATION PROCEDURES

A. AVIATION MAP AND NARRATIVE

Federal agencies have mapped aviation issues in their fire management action plans. Moffat County and CSFS have not developed such a map.

B. FLIGHT FOLLOWING/FREQUENCY MANAGEMENT

CRC will flight follow for aircraft ordered through them. If radio communication problems develop, CRC will coordinate with adjacent dispatch centers to provide flight following.

C. CWN AIRCRAFT (Call When Needed)

Beyond the scope of this plan.

D. FIXED WING BASE MANAGEMENT

There are no permanent air tanker bases in Moffat County.

E. SINGLE ENGINE AIR TANKER (SEAT) BASES

When a combination of factors or events, as agreed to by the Sheriff and CSFS, create a situation that warrants pre-positioning of a SEAT in Moffat County, the Sheriff should request pre-positioning through the CSFS fire duty officer. Factors may include, but are not limited to, multiple starts within a 24 hour period, high occurrence of dry lightning, or persistent Red Flag Warnings. CSFS will notify participants to this plan when a SEAT is pre-positioned in Moffat County.

Each agency should follow their normal resource request procedure to request a SEAT for use on an incident, regardless of whether the SEAT is pre-positioned in Moffat County or not.

F. LEADPLANE/AIR ATTACK ACTIVATION

The determination to use a leadplane or air attack on an incident will be made by the IC in coordination with CRC in accordance with Policy.

G. AVIATION REQUESTS AND OPERATIONS

Requests for tactical aircraft will be made only by the responsible official of the jurisdictional agency. For fires on state or private lands, aircraft orders will be made through CRC, and will only be accepted from the County Sheriff, Undersheriff, or other Authorized Agency Personnel (See Exhibit c).

Aircraft identified section VI. may be available as initial attack resources. These aircraft and others are on national contracts. It should be realized that if ordered, aircraft may come from out of state, which could incur costs well beyond those that could be expected when aircraft are located at Grand Junction or Lakewood.

For fire season 2003 the Initial Attack Aircraft Agreement will be suspended. It will be replaced by the Wildfire Emergency Response Fund (WERF). Please see Exhibit E for complete operating procedures. The preferred method for ordering aircraft is via the Craig Dispatch Center (CRC). All aircraft orders made from the County Sheriff to the CRC will be considered a valid request from the county and obligation of county funds for that aircraft. It is preferred that such requests come from the CRC, however, if more expedient, the request may come directly from the Sheriff, Undersheriff, or authorized agency representatives listed in Exhibit C. The CRC shall immediately notify the appropriate State District Forester or CSFS Fire Duty Officer whenever a county requests aircraft assistance.

H. INSPECTION SCHEDULES

No aircraft inspections are scheduled.

XI. FIRE PREVENTION

A. GENERAL COOPERATIVE ACTIVITIES

When cooperating agencies determine that the fire danger warrants, fire prevention/suppression patrols may be initiated. If prevention patrol personnel are signed up as AD's, they could be required to respond anywhere on the administrative unit. Volunteer patrol personnel will not be required to respond.

B. INFORMATION AND EDUCATION

1. FIRE DANGER

a. FIRE WEATHER STATION LOCATIONS

There are 3 remote automatic weather stations in Moffat County; Lodore(BLM), Success(NPS), and Great Divide(BLM). There is one permanent fire weather observing station; Dinosaur HQ(NPS).

b. DATA SHARING AND METHODS

The Northwest Colorado Fire Management Unit through CRC monitors local fire danger levels. This information is available to local cooperators upon request. Daily Situation Statistics are on the web site:
www.fs.fed.us/r2/fire/crc/dailybrief.htm

c. FIRE DANGER DISSEMINATION

CRC will broadcast/FAX weather between 1000 and 1030 hours. Between 1600 and 1630 hours CRC will broadcast/FAX fire danger rating with weather forecast and predicted fire danger rating for the next day.

d. FIRE PREVENTION SIGNS

Each agency will determine when and where to place fire prevention signs.

2. JOINT OR SINGLE AGENCY PRESS RELEASES

Each agency will prepare and release fire prevention material and media presentations according to its own prevention plans. Coordination with other agencies should be maintained in order to prevent a conflict in released material. Where pertinent, all news releases for fire prevention will carry USFS, CSFS, BLM, NPS, USF&W, fire district or county sheriff by-line.

3. SMOKEY BEAR PROGRAM

Cooperating agencies may purchase Smokey Bear materials through CSFS.

4. "FIREWISE" PROGRAMS

This program is currently being used in Moffat County.

5. RED FLAG ANNOUNCEMENTS

The National Weather Service in Grand Junction periodically issues "RED FLAG" watch and warning bulletins. When these bulletins are announced, CRC will notify the Moffat County Sheriffs Office and the Steamboat Springs office of CSFS via FAX or email.

C. ENGINEERING

1. LAND USE PLANNING (WILDLAND-URBAN INTERFACE)

Moffat County requires that a wildfire hazard review be conducted by CSFS and the fire protection district on all proposed subdivisions. Implementation of recommended wildfire hazard mitigation procedures is voluntary.

2. RAILROADS AND UTILITIES

No formal inspections or requirements.

D. ENFORCEMENT

1. OPEN BURNING PERMITS

No burn permit is required in Moffat County for open burning within the County. For prescribed burns the jurisdictional agency will follow agency prescribed fire policy and procedures, and notify Moffat County Sheriffs Office and Craig Dispatch Center. Such notification should include the location, timing, and nature of prescribed burns.

2. RESTRICTIONS AND CLOSURES

Requests for closures prohibiting open fires during hazardous periods should be coordinated to include private, state, and federal lands when possible. Requests will be made by the jurisdictional agency with notification given to all other agencies. Requests should be submitted in writing to the respective granting authority. The granting authority and jurisdictional agency(ies) shall jointly

prepare and promptly distribute media releases concerning the closure. In the case of any restrictions on burning or public movements because of extreme fire danger, either by Governor's proclamation or by local issue, the county sheriff will be responsible for enforcement on all non-federal lands, and may assist on other lands at the request of the appropriate agency.

3. FIRE INVESTIGATIONS

The jurisdictional agency will have primary responsibility for fire investigation, and any civil or criminal follow up actions taken.

Additionally, however, the jurisdictional agency will keep other responding agencies informed of the status of its investigations and legal actions.

XII. FUELS MANAGEMENT AND PRESCRIBED FIRE CONSIDERATIONS

Wildfires resulting from escaped prescribed fires, ignited by, or at the direction of, or under the supervision of any party to this agreement, shall be the responsibility of that party, and all suppression costs shall be borne by that party.

XIII. COST REIMBURSEMENTS

A. REIMBURSABLE COSTS

Costs incurred by an assisting agency for services that exceed initial attack, as described in section IX.E., shall be considered reimbursable. These services must be requested by the jurisdictional agency through their dispatch center or documented by the incident commander in the fire report. Resources not documented by a resource order number or by the incident commander may not be reimbursable.

When a wildfire occurs on lands of more than one agency, and costs are incurred in addition to the initial attack, reimbursement will be based on Wildland Fire Situation Analysis developed criteria.

B. REIMBURSEMENT PROCEDURES

The county may aggregate expenses incurred by the county and fire districts to suppress fires on federal jurisdictions, and may present an invoice for such expenses to CSFS, who will then reimburse the county and subsequently bill the jurisdictional federal agency or agencies.

Federal agencies may submit bills and statements for reimbursements from county and/or fire districts for federal suppression on non-federal

lands to CSFS. CSFS will make such reimbursement and subsequently invoice the county or fire district as appropriate.

All CSFS reimbursement will have invoices sent to the Steamboat Springs CSFS office within 30 days after incident resources are released. All invoices are required to have proper documentation before the process for payment can be completed. This will include information on personnel time, equipment time, and rates of pay.

C. RESOURCE USE RATES

CSFS equipment use rates are computed annually. These rates apply to CSFS equipment, including that currently assigned to individual fire districts and that contracted with fire districts. A state wide Fire Equipment Rental Agreement is in place for all CSFS equipment.

CSFS FIRE EQUIPMENT USE RATES (Exhibit D)

Fire Equipment Rental Agreements between federal agencies and fire districts or private suppliers will be completed annually by April 30. Costs for equipment not covered by such an agreement may not be reimbursed by the jurisdictional agency unless rates are mutually agreed to, in writing, at the time of hire.

Wages of personnel shall be at the actual cost to the assisting agency. Volunteers must be hired by a federal agency as casuals (AD's) in order to be paid.

Current AD rates, for the Western Area, from the USFS Fire Business Management Handbook are as follows:

- Fire Department Chief or County Sheriff (or their acting) in capacity of an Incident Commander, Agency Coordinator, or Group Supervisor.....AD-5
- Engine Boss.....AD-4
- Squad Boss.....AD-3
- Experienced Firefighter.....AD-2
- Inexperienced Firefighter.....AD-1

Personnel will be paid based on the position they occupy on the fire, as established by the Incident Commander, rather than on their individual qualifications. AD's are not eligible for overtime or premium rates. Unless mutually agreed upon, personnel from other than the jurisdictional agency will be released by the next day operational period following initial attack.

XIV. GENERAL PROCEDURES

A. PERIODIC PROGRAM REVIEW

Program reviews will be conducted at the annual fire operating plan meeting in March.

B. ANNUAL UPDATING OF PLAN

The annual fire operating plan will be updated each year. A meeting of cooperating agencies will be held during the first week of March each year. The updated plan will be circulated for signatures prior to May.

C. MID YEAR CHANGES

Mid year changes are to be avoided; however, if an agency becomes unable to uphold commitments, it should notify all parties to this agreement.

D. RESOLUTION OF DISPUTES

The primary purpose of this operating plan is to ensure prompt suppression of wildland fires. Any interagency dispute arising from these procedures will be resolved on site by the Unified Command Group. When necessary, following the conclusion of the fire incident, a panel of agency representatives other than the participants in the incident will review and resolve the dispute.

XV. DIRECTORY OF PERSONNEL

Moffat County

Sheriffs Department	824-4495
Buddy Grinstead, Sheriff	824-8941-H 326-6814-C
Jerry Hoberg, Undersheriff	824-4146-H 326-8116-C
Tim Jantz, Fire Warden	272-3779-H 326-8849-C
Road Department	824-3211
Billy Mack, Co. Road Supervisor	326-5262-H

Craig Interagency Dispatch Center (CRC)

Craig 24 hour number	970-826-5037
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Appendix C

Northwest Colorado Fire Management Unit - Craig Station

Business Office(BLM) 970-826-5000
Business Office (USFS-Steamboat) 970-879-1870
Fire Dispatch (24 hr) 970-826-5037
Mike Rieser, FMO 970-824-2919-H
970-326-8627-cell
Cliff Hutton, AFMO 970-826-0694-H
970-326-6777-cell
Cathy Hutton, Center Manager 970-826-0694-H
970-629-1256-cell
Dale Skidmore, North Zone FMO 970-629-5108-H
970-326-5074-cell

Steamboat- Station 879-1870-W
Kent Foster, Central Zone FMO 879-1173-H 870-2142-W
Kim Vogel, District Ranger 879-2865

Maybell VFD

Dave O'Conor, Chief 272-9929-H_____

Artesia FPD

Robert Ormsbee, Chief 374-2849-H

Craig Rural FPD 824-5914

Roy Mason, Chief 824-3908-H

Dinosaur National Monument 374-3000

Mark Rosenthal, FMO 374-3014-W
374-2752-H
970-629-0191-cell
254-381-5343-sat
Steve Penny, 374-3011-W 435-781-8895-H
970-629-0192-C
Cat Zacherson, Fire Program Asst. 374-3015-W
435-790-3490-C

Appendix C

Browns Park National Wildlife Refuge 970-365-3613

VACANT, Fire Program Tech -H
-sat -cell

Jerry Rodriguez, Refuge Manager 365-3595-H

Suzanne Halvorson, Refuge Ops Specialist 970-365-3615-H

Browns Park NWR Fire Bunkhouse 970-365-3618

Colorado State Forest Service FAX 879-2517 879-0475-W
Call in this order

Terry Wattles, cell 970-217-2198 879-0716-H
John Twitchell cell 970-222-4070 723-4505-W & H
Brook Lee cell 97-218-6587 723-4505-W
State Office Fire Duty Officer 970-491-6304
State Office Fire Duty Officer cell 970-222-2784

Appendix D – Inventory of Fire Protection Resources

Moffat County Sheriff's Department

- #1 1967 Kaiser 6x6 Pumper; 789 Gal. (Maybell)
- #2 1967 Kaiser Pumper; 900 Gal. (Vermillion)
- #3 1972 AM GEN. 6x6 Foam; 700 Gal. (Craig)
- #4 1984 Chevy 1 Ton Pumper; 200 Gal. (Maybell)
- #5 1967 Kaiser 6x6 Pumper; 1,000 Gal. (Craig)
- #6 1967 Kaiser 6x6 Pumper; 1,000 Gal. (Craig)
- #7 Kaiser 6x6 Utility; Utility; (Craig)

Craig Rural Fire Protection District

- 1—Tanker; 3,500 Gal.
- 3—Engines (brush trucks); 1,000,1000,600 Gal.
- 1—Rescue Truck
- 3—Pumpers; 300, 1000, 600 Gal.
- 1—Utility Truck; 300 Gal.
- 1—Hazmat Truck & 3—Hazmat Trailers
- 1—Command Vehicle

Maybell Fire Department

- #1 1993 Dord Rescue Truck; 250 Gal. Slide in (foam capable)
- #2 1985 Dodge; 100 Gal. (not 100% fire ready)
- #3 1967 International Mid Pumper; 500 Gal. (aux. Pump)
- #4 1961 FWD; 500 Gal.
- #5 1989 Ford; 1200 Gal.
- #6 1985 International; brush truck-600 Gal.
- #7 2002 Freightliner Water Tender; 3200 Gal.
- 3—Portable Trash Pumps
- 1—3000 Gal. Pumpkin tank
- 1—Portable Tank**

Appendix E – Technical Descriptions of Vegetation Based Fuel Types

**Technical Descriptions
for the
Categorization of Vegetation Based Fuel Types During
Semi-Automated Mapping of Wildfire Mitigation Inputs**

Prepared by
William J. Whatley
Native Communities Development Corporation

**NCDC Reference Paper WJW-04, Version 03
September, 2004**

NCDC's categorization of vegetation based fuels types is one component of the semi-automated mapping of wildfire mitigation inputs. NCDC's mapping of fuels categories is not intended to represent a particular set of "fuels models," nor is it intended to represent the precise spatial mapping of vegetation "species or types". The purpose and intent are to simply assign visible vegetation patterns into basic "best-fit" categories that may be of further use to fire personnel in defining fuels models. These best-fit categories generally include the eight categories identified below, but can include additional or alternate categories that better meet regional needs. Along this line of thought, it is important to note that "not all categories" will necessarily be present in each project area that is being mapped. Each of these eight categorizes are described in greater detail in this document.

NCDC Fuels Categories

Timber (*Trees*)

Scrub/Timber (*Tree-Scrub Mix*)

Scrub (*> 4ft high but not really a Tree*)

Shrub/Scrub (*Shrub-Scrub Mix*)

Shrub (*<4ft high but not grass*)

Grass

Agricultural

Burned

The process utilized by NCDC initially involves subjective assignment of a vegetation pattern to a fuels category using simple fuels category definitions, and heavy emphasis on the observation of visual attribute patterns evident in the high resolution satellite imagery. Whenever possible, the assignment is supplemented by ground verified observations (data points).

This effort produces a series of “training samples” that are used as inputs into a computer based automated extraction process that relies upon hierarchical learning. The hierarchical learning involves the systematic use of “iterations” wherein the analyst repeatedly confirms accurate and in-accurate identifications generated by each pass of the computer’s automated extraction process. This system can involve from three to eight iterations (passes). Inherent in this system is the fact that bias is introduced and maintained by the analyst who is teaching the automated extraction process. It is therefore important that the analyst have a firm understanding of the vegetation being mapped. When possible, the analyst should be equipped with an adequate number of ground verified data points. However, the color pan-sharpened QuickBird high resolution satellite imagery (source data) is capable of displaying individual trees, shrubs and plants at a pixel resolution of 0.6 meters. As a result, a shrub encompassing only four square feet of spatial area can be seen by the analyst in the imagery and subsequently mapped by the automated extraction process. This visual “strength” often permits identification of “species” directly from the satellite imagery. Therefore, even with any bias and/or potential “false identifications” included, NCDC’s categorization of vegetation based fuels types is far more accurate than mapping accomplished with Landsat 30 meter pixel resolution imagery because the “targets” can be seen. In addition, it is also far more cost efficient than precision mapping of the individual vegetation species.

1. **Timber** (*Trees*)

The fuels category “Timber” includes both individual free-standing trees and groves of trees characterized by an interconnected canopy. Trees are assumed to be greater than 10 feet in height but can be intermixed with shorter specimens of the same or similar species (saplings), or with a Scrub category such as oak or willow. In such cases of intermixing, the sub-category “Scrub/Timber” can be used. However, if it is apparent that the vast majority (75%+) of the specimens are actual trees, then the Timber categorization would be applied.

Individual tree crowns usually are greater than 50 square feet in spatial area (plan view) and almost always exhibit visible textural shadowing within the crown or canopy that is indicative of branching and slight variations in foliage height. This is accompanied by variations in color that are also the result of branching and slight variations in height. However, special attention must be paid towards globe willows and other domed trees where branching is often not visible, yet height variation occurs that is uniformly distributed around the crown. Another key characteristic of the Timber fuels category is the shadow that is cast by the individual tree or the stand of trees, depending on the sun’s position and the angle of the satellite imagery. This ground shadow can confirm the dominant height of the Timber category and is a valuable key in distinguishing Timber from shorter vegetation.

Extraction/mapping of the Timber Category requires multiple trained extractions of unique Timber patterns. The uniqueness of the patterns may reflect a species type, a particular crown shape, and/or a combination of texture, hue and multispectral reflectance (Including shadowing). These multiple extractions are then combined to form a single Timber fuels category.

Strengths & Weaknesses: The Timber fuels category mapping from QuickBird satellite imagery is considered very accurate when compared to vegetation mapping/assignment using LandSat 30 meter pixel resolution imagery. This accuracy is best exemplified by the fact that isolated, free-standing trees are recorded, as are “surviving trees” located within burned areas.

However, the high pixel resolution of the QuickBird imagery can produce small “false bogies” due to the crown texture shadowing included in the initial training samples. These shadows may lead to incorrect polygon delineations of similar small shadowed areas located in non-Timbered areas. Because the inclusion of the crown texture shadowing is an inherent component of the initial training samples, these small false bogies can not be avoided or readily excluded. Reasonable efforts are made to eliminate many of these false bogies, but the end user must be aware that some will undoubtedly be retained.

Another weakness worth noting is the occasional inclusion of a small Scrub or Shrub area within the same polygon that has (for the most part) accurately delineated a stand of Timber. These falsely assigned Shrub or Scrub areas are always situated

immediately adjacent to that particular Timber stand. Their inclusion is often due to the presence of timber “saplings” intermixed (and detected) with the scrub or shrub. Reasonable efforts are made to correct most of these false assignments, but the end user must be aware that some will undoubtedly be retained.

Fuels Relevance: The fuels category “Timber” is significant due to the “biomass” of flammable material it represents that, in the case of living or unseasoned timber, is accompanied by a resin or “sap” constituent that can propagate a fire. These two dangerous attributes are further compounded by three additional factors: height, reach and density. Height pertains to a trees ability to move fire up or down in a vertical fashion (vertical laddering). Reach is the vertical placement of horizontal branching and pertains to a trees ability to retrieve fire from adjacent burning trees at various stages in its height (horizontal laddering). Density pertains to a trees ability to rapidly spread fire to numerous adjacent trees, thereby propagating a crown fire. Last but not least is the potential “BTU” generation that varies between hardwoods and softwoods. These variables can drastically affect the height of a fire’s flame, the intensity of the fire’s heat, and the speed of the fire’s spread.

EXAMPLES OF TIMBER CATEGORIZATION



Large Cottonwood Grove Mixed with Russian Olive (Scrub to Right of Road)



Large Cottonwood Grove Surrounded by Isolated Cottonwood Trees

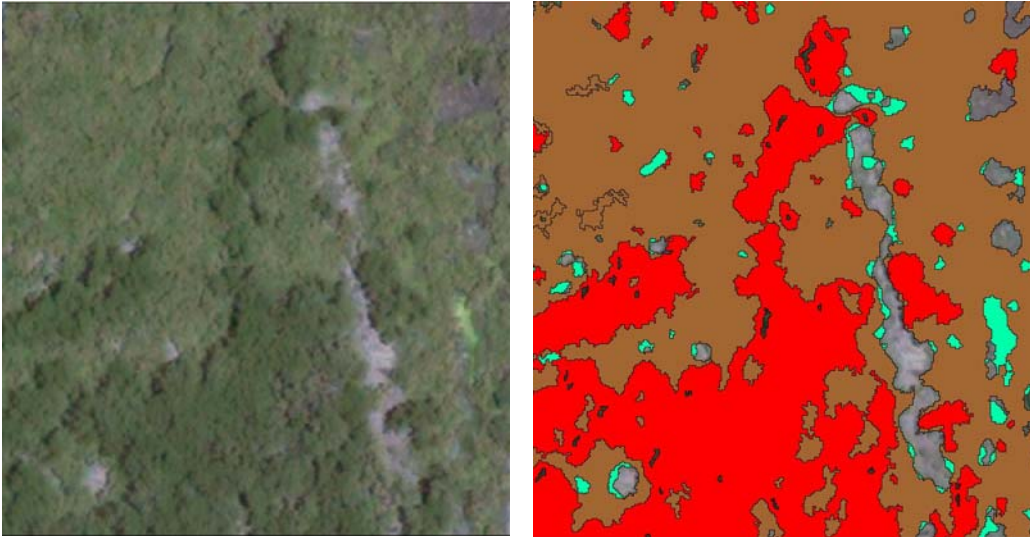


2. **Scrub/Timber (Mix)**

The fuels category “Scrub/Timber” is assigned when a visible intermixing of both Scrub and Timber is evident that does not appear to favor either category yet conveys a visible stand formation. As such, the Scrub/Timber category always includes multiple specimens within a single polygon that exhibit characteristics of both the Scrub and the Timber fuels categories. This commonly occurs in areas where the individual plants exhibit a border-line height lending themselves to assignment within either the Scrub or the Timber fuels category. In most situations, there are nearby stands of definable Timber and Scrub that can help to define how and where this fuels category is used. The end user must therefore be aware that, within any given polygon assigned to the Scrub/Timber category, individual plants will exhibit similar or identical characteristics to specimens identified in nearby stands of definable Timber and Scrub. “Context” is therefore a major consideration when assigning a polygon to the Scrub/Timber category.

Strengths & Weaknesses: Admittedly, the Scrub/Timber fuels category represents a subjective but reasonable mapping solution for categorizing areas that exhibit a much higher degree of variation than nearby stands of definable Timber and Scrub. However, it is important to note that this variation is suggestive of a transitional ecosystem that is often associated with fuels laddering.

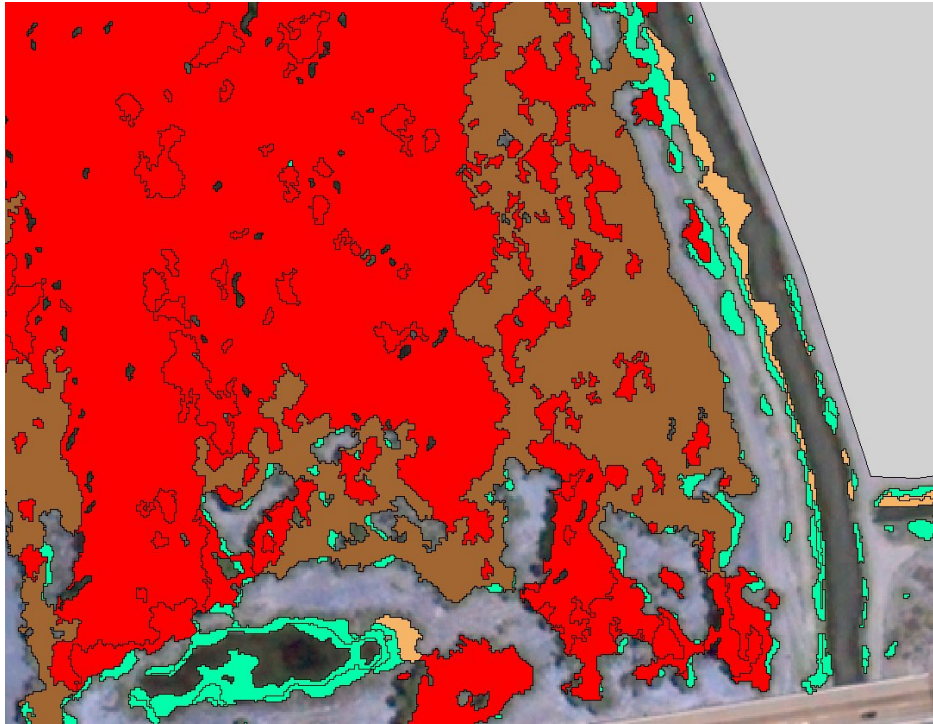
EXAMPLES OF SCRUB/TIMBER CATEGORIZATION



Comparative Imagery Examples Showing “Timber” Fuels Categorization in Red and “Scrub/Timber” Fuels Categorization in Brown with Minor Occurrence of “Shrub/Scrub” in Blue-Green



Comparative Imagery Examples Showing “Timber” Fuels Categorization in Red and
“Scrub/Timber” Fuels Categorization in Brown with Minor Occurrence of
“Shrub/Scrub” in Blue-Green and “Scrub” in Light Orange



3. Scrub (> 4ft high but not really a Tree)

The fuels category “Scrub” includes thickets of small stem diameter foliage that are assumed to be taller than 4 feet, but comparably shorter than the visible surrounding Timber. In general terms, Scrub is between 4 to 12 feet in height. The Scrub category often includes multiple specimens within a single polygon which appear as a small grove, thicket, or briar. They are usually composed of oak, willow, Tamarisk, or sapling stands of Russian olive or Aspen. Occasionally, thickets of tall sage-brush will also be classified as scrub. Regional variations in plant species composition should be expected.

Individual crowns usually are not readily visible but a texture produced by slight shadowing from height variations is. Depending on the sun’s position and the angle of the satellite imagery, Scrub should cast a ground shadow due to its height. This ground shadow is a valuable key in distinguishing Scrub from Shrub.

Scrub may be intermixed with specimens of the Timber category, in which case an effort is made to assign the intermixed stand to the “Scrub/Timber” category. Likewise, Scrub may be intermixed with shorter “Shrubs” (4 feet or less in height) in a manner that makes distinct classification not possible or not cost effective (too time consuming). This commonly occurs along steep sided ditch and river banks, but may

also represent the peripheral edge of a Scrub thicket or a grove of Timber. In such cases of intermixing, the sub-category “Shrub/Scrub” is used where possible.

Extraction/mapping of the Scrub fuels category requires multiple trained extractions of unique Scrub patterns. The uniqueness of the patterns may reflect a species type and/or a combination of texture, hue and multispectral reflectance (Including shadowing). These multiple extractions are then combined to form a single Scrub fuels category.

Strengths & Weaknesses: Scrub fuels category mapping from QuickBird satellite imagery is considered relatively accurate when compared to vegetation mapping/assignment using LandSat 30 meter pixel resolution imagery. This accuracy is best exemplified by the fact that stands of Scrub can clearly be seen in QuickBird imagery that are comparably shorter than nearby Timber, yet taller than surrounding Shrubbery and grass. These stands can be readily extracted and mapped.

However, the high pixel resolution of the QuickBird imagery can produce small “false bogies” due to the texture shadowing included in the initial training samples. These shadows may lead to incorrect polygon delineations of similar small shadowed areas located in non-Scrub areas. Because the inclusion of the texture shadowing is an inherent component of the initial training samples, these small false bogies can not be avoided or readily excluded. Reasonable efforts are made to eliminate many of these false bogies, but the end user must be aware that some will undoubtedly be retained.

Another weakness worth noting is the occasional inclusion of small areas of Shrubbery within the same polygon that has (for the most part) accurately delineated a stand of Scrub. These falsely assigned Shrub areas are usually situated in close proximity to that particular stand of Scrub. Reasonable efforts are made to correct most of these false assignments, but the end user must be aware that some will undoubtedly be retained. Likewise, the texture, hue and shadowing defined in the initial training samples may also result in the assignment of isolated Shrubs to the Scrub fuels category. This is especially true if the plant mass exhibits a border-line height lending itself to assignment within either a Shrub or a Scrub fuels category. Last but not least is the occasional misclassification as a Scrub of peripheral shadows bordering stands of Timber. Though these are false bogies are usually found and eliminated, a few may escape detection.

Fuels Relevance: The fuels category “Scrub” is significant because it occurs in groves, thickets, and briars that collectively represent significant accumulations of flammable “biomass” that also retain significant “BTU” generation potential. These two dangerous attributes are further compounded by the two additional factors: height and density. Height pertains to the grove, thicket, or briar’s ability to move fire up and into adjacent stands of Timber (vertical laddering) whereas density pertains to a grove, thicket, or briar’s ability to rapidly spread fire to numerous adjacent thickets and/or stands of Timber. In addition, Scrub is usually associated with hardwoods and

therefore retains the ability to produce longer burning aerial sparks or firebrands. All of these variables can drastically affect the height of a fire's flame, the intensity of the fire's heat, and the speed of the fire's spread.

4. **Shrub/Scrub (Mix)**

The fuels category "Shrub/Scrub" is assigned under two sets of conditions. First, it is assigned when a visible intermixing of both Shrubbery and Scrub is evident that does not appear to favor either category yet conveys a definable formation. In many situations, there are nearby stands of definable Shrubbery and definable Scrub that can help to indicate where this condition is met. In such situations, the Shrub/Scrub assignment will include multiple specimens within a single polygon that exhibit characteristics of both the Shrub and the Scrub fuels categories. This commonly occurs in areas where the individual plants exhibit a border-line height lending themselves to assignment within either the Shrub or the Scrub fuels categories.

The second condition for use is assignment to the Shrub/Scrub fuels category when no real distinction can be made by the analyst as to whether the plant specimen(s) are either Shrubbery or Scrub. This condition may occur in areas obscured by shadowing, along steep sided canal, ditch, stream or river banks, or when atmospheric distortions are present in the satellite imagery (smoke, clouds or rain). In such situations, the end user must therefore be aware that, within any given polygon assigned to the Shrub/Scrub category, individual plants will exhibit similar or identical characteristics to specimens identified in nearby polygons as Shrub or Scrub. "Context" is therefore an important consideration when assigning a polygon to the Shrub/Scrub category.

Strengths & Weaknesses: Admittedly, the Shrub/Scrub fuels category represents a subjective but reasonable mapping solution for categorizing areas that exhibit either a much higher degree of variation than nearby polygons of definable Shrub and Scrub, or a lack of definable characteristics that would permit a more accurate assignment.

Appendix F

Fuel Reduction Project Plans

Bakers Peak Fuel Treatments—Roads

Description of Proposed Actions

The roads on Bakers Peak are all privately owned and narrow, averaging 10 ft. in width. In many cases vegetation and fuels crowd the edges of the roads. Each tract on Bakers Peak has a 40 ft. publicly deeded easement for the main access roads. The overall goal of the projects is to reduce the spread of crown fires, reduce fuel density along roads, and increase safety for firefighters and landowners.

Need for Proposed Action and General Recommendations

The fuel treatments were designed to break up high risk fuels across the community and provide as much protection as possible for the community as a whole. The GIS mapping system and clear identification of fuels should assist landowners, agencies, and contractors in managing and completing the projects. The recommended treatment along the roads is to create a “shaded” fuel break 80-120 ft in width (from centerline) with 20-30 ft. spacing between trees or shrubs. If hand thinning is done the slash piles should either be piled and burned or removed from the site. Mechanical (grinding) operations would eliminate the need for further slash treatments. Due to the general south sun aspect fuels dry out early in the fire season. Projects could be completed during the period of June-September annually.

Mitigation Area Information

- Area #1—Mixed scrub oak and aspen; 23.2 acres; less than 10 degree slope; S/SW sun aspect; mechanical or hand thinning.
- Area #2—Scrub oak; 6.4 acres; less than 10 degree slope; S/SW sun aspect; mechanical or hand thinning.
- Area #3—Mixed scrub oak and aspen; 6.5 acres; less than 10 degree slope; S/SE sun aspect; mechanical or hand thinning.
- Area #4—Mixed scrub oak and aspen; 2.6 acres; less than 10 degree slope; E/SE aspect; mechanical or hand thinning.
- Area #5—Mixed scrub oak and aspen; 3.6 acres; 0-20 degree mixed slope; S/SW aspect; limited mechanical or hand thinning.
- Area #6—Mixed scrub oak and aspen; 9.3 acres; 0-20 degree mixed slope; S/SW sun aspect; limited mechanical or hand thinning.
- Area #7—Mixed scrub oak and aspen; 15.6 acres; 0-20 degree mixed slope; S/SE sun aspect; limited mechanical or hand thinning.
- Area #8—Mixed scrub oak and aspen (lower section); mixed timber and aspen (upper section); 38.6 acres; 0-20 degree mixed slope; S/SE sun aspect; limited mechanical or hand thinning.
- Area #9—Mixed timber and aspen; 15.2 acres; 0-20 degree mixed slope; 50% E/SE sun aspect; limited mechanical or hand thinning.

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- Area #10—Mixed timber and aspen; 19.4 acres; 0-20 degree mixed slope; E/SE sun aspect; limited mechanical or hand thinning.
- Area #11—Road and old fence line; 18 acres Mixed timber and aspen; 11-20 degree slope; limited mechanical or hand thinning.

Wildlife Issues

The fuel mitigation projects are expected to cause minimal soil disturbance and are not expected to negatively impact wildlife habitat. Reducing some of the old-age class fuels should improve deer and elk habitat. Columbian Sharp-tailed grouse are found in the community and there is an established lek on the State land (east access). No leks have been found within the community.

Watershed Issues

None of the proposed treatment projects is near a water source. The minimal disturbance associated with the projects should have no impact on the watershed

Constraints and Concerns

Many landowners are in favor of proceeding with treatment projects and believe a lot of work is possible within the existing 40 ft. road right-of-way. Landowners are concerned that the recommended 80-120 ft treatment width may be opposed by landowners who are not in favor of doing any mitigation.

Wilderness Ranch Fuel Treatments—Roads and Open Space

Description of Proposed Actions

The roads on Wilderness Ranch are all designated County roads with 100 ft. rights-of-way. Vegetation has encroached into the rights-of-way on many of the roads. The open space treatments are located in areas with dense timber, beetle killed trees, downed timber, and hazardous ground fuels. The overall goal of the projects is to reduce fire intensity, reduce the spread of crown fires, and increase safety for firefighters and homeowners.

Need for Proposed Actions and General Recommendations

The main risk to Wilderness Ranch from wildfire is from the west and south. Higher elevations are experiencing beetle kill, hence, there are dead and dying trees that will increase the likelihood for a larger, high elevation fire to move downhill into Wilderness Ranch. The fire management agencies have suggested that private property owners should focus on reducing the volatile fuel types (oak brush & spruce/fir) on their properties and work with the State Forest Service to protect structures. The fuel treatments were designed to break up high-risk fuels across the community and provide as much protection as possible for the community as a whole. The GIS mapping system and clear identification of fuels should assist landowners, agencies, and contractors in managing and completing the projects. The recommended treatment along roads is to clear the full width of the ROW using a combination of brush beating, Hydroax or other mechanical means, or hand cutting of trees, depending on vegetation types. If hand thinning is done the slash piles should either be piled and burned or removed from the

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site. Mechanical (grinding) operations would eliminate the need for further slash treatments. The work should be done early in the fire season annually. The recommended treatments for the open space areas includes thinning of fuels with a 20-30 ft. spacing between trees and shrubs and removal of dead and downed timber. Projects could be completed during the period of June –September annually.

Mitigation Area Information

- Area #12—Mixed scrub oak and aspen; 4.2 acres; less than 10 degree slope; minor S/SE sun aspect; mechanical or hand thinning.
- Area #13—Mixed oak brush and aspen; 12.7 acres; 0-20 degree mixed slope; S/SE aspect; brush beating, mechanical, or hand cutting.
- Area #14—Mixed oak brush and aspen; 2.2 acres; less than 10 degree slope; E/SE sun aspect; brush beating, mechanical, or hand cutting.
- Area #15—Mixed timber and aspen; 19.9 acres; 0-20 degree mixed slope; E/SE sun aspect; brush beating , mechanical, or hand cutting.
- Area #16—Mixed timber and aspen; 4.7 acres; 0-20 degree slope; E/SE sun aspect; brush beating, mechanical, or hand cutting.
- Area #17—Timber; 5.7 acres; 0-20 degree mixed slope; minor E/SE sun; brush beating, mechanical, or hand cutting.
- Area #18 and #19—Open space treatment in heavy timber; 32.8 acres; 0-20 degree mixed slope; minor E/SE sun aspect; mechanical or hand thinning and slash removal.
- Area #20—Open space treatment in mixed timber and aspen; 5.9 acres; less than 10 degree slope; minor S/SE sun; mechanical or hand thinning.
- Area #21—Combination road and open space in mixed timber and aspen; 6.7 acres; 0-20 degree mixed slope; E/SE sun aspect; brush beating, mechanical, or hand thinning/cutting.
- Area #22—Mixed oak brush and aspen; 8.7 acres; 0-20 degree mixed slope; E/SE sun aspect; brush beating, mechanical, or hand cutting.
- Area #23—Mixed timber and aspen; 11.6 acres; less than 10 degree slope; S/SE aspect; brush beating, mechanical, or hand cutting.
- Area #24—Mixed timber and aspen; 11.6 acres; 0-20 degree mixed slope; S/SE sun aspect; brush beating, mechanical, or hand cutting.

Wildlife Issues

The fuel mitigation projects are expected to cause minimal soil disturbance and are not expected to negatively impact wildlife habitat. Reducing some of the old-age class fuels should improve deer and elk habitat. Columbian Sharp-tailed grouse are found in the community and there are several established leks to the west, but no leks have been found within the community.

Watershed Issues

None of the proposed treatment projects is near a water source. The minimal disturbance associated with the projects should have no impact on the watershed.

Knez Divide Fuel Treatments—Open Space and Powerline Structures

Description of Proposed Actions

The major power transmission line that runs across the south side of the Knez Divide community has three structures located in dense oak brush. The open space treatments are located in areas where medium-risk sagebrush fuels connect higher-risk oak brush fuels.

The overall goal of the projects is to reduce fire intensity, protect transmission line structures that, if compromised by fire, could create additional fire risk, and increase safety for firefighters and homeowners.

Need for Proposed Actions and General Recommendations

The fuel treatments were designed to protect transmission line structures and break up high-risk fuels in the southern part of the community. There are scattered high-risk fuels (oak brush) associated with Zones of Concern 24 (MCR33) and 25 (MCR 206). Fuel treatments were considered but found to be impractical for reducing fire risk on a community level in these areas. It is recommended that landowners focus on reducing the volatile fuel types (oak brush and sagebrush) on their properties and work with the State Forest Service to protect structures. The recommended treatment for transmission line structures is to thin the oak brush around the structures to a 120 ft. diameter with 20-30 ft. spacing between shrubs. The recommended treatment for the open space areas is brush beating the sagebrush and thinning oak brush with 20-30 ft. spacing between shrubs. If hand thinning is done the slash piles should either be piled and burned or removed from the site. Mechanical (grinding) operations would eliminate the need for further slash treatments. Oak brush sprouts back very quickly after treatment. Chemical treatment can be effective in oak, and landowners may want to consider this option for long term fuel reduction. Projects could be completed during the period of May-September annually.

Mitigation Area Information

- Area #25—Open area treatment; mixed oak brush and sagebrush; 2.5 acres; 11-20 degree slope; E/SE sun aspect; brush beating, mechanical, or hand thinning.
- Area #26—Open area treatment; mixed oak brush and sagebrush; 4.4 acres; 11-20 degree slope; E/SE sun aspect; brush beating, mechanical, or hand thinning.
- Area #27—Transmission line structure; mixed oak brush and sagebrush; 4.1 acres; 11-20 degree slope; E/SE sun aspect; brush beating for sage without slopes, mechanical, hand thinning.
- Area #28—Transmission line structure; mixed oak brush and sagebrush; 4.0 acres; less than 10 degree slope; E/SE sun aspect; brush beating for sagebrush, mechanical, or hand thinning.
- Area #29—Transmission line structure; mixed oak brush and sagebrush; 3.6 acres; less than 10 degree slope; E/SE sun aspect; brush beating for sagebrush, mechanical, or hand thinning.

Wildlife Issues

The fuel mitigation projects are expected to cause minimal soil disturbance and are not expected to negatively impact wildlife habitat. Reducing some of the old-age class fuels should improve deer and elk habitat. Columbian Sharp-tailed grouse are found in the community and there are several established leks on adjacent land to the west and east. No leks have been found within the community.

Watershed Issues

None of the proposed treatment projects is near a water source. The minimal disturbance associated with the projects should have no impact to the watershed

Greystone Fuel Reduction Projects—Pinyon/Juniper and Sagebrush

Description of Proposed Actions

Concern by several landowners for the risk of wildfire in the Greystone community was expressed to Moffat County. A cooperative effort among landowners, the BLM, and Moffat County resulted in the design of a fuel break on south and west side of the community in dense pinyon/juniper stands. A second fuel break has been designed on the east side of the community in thick sagebrush. The overall goal of the projects is to reduce the spread of crown fires in pinyon/juniper, reduce the spread of wildfires in sagebrush, and increase safety for firefighters and landowners.

Need for Proposed Actions and General Recommendations

The fuel treatments were designed to provide a break in high-risk fuels across the community and provide as much protection as possible for the community as a whole. The GIS mapping system and clear identification of fuels should assist landowners, agencies, and contractors in managing and completing the projects. The recommended treatment in pinyon/juniper is to create “shaded” fuel breaks 80-120 ft. in width with 20-30 ft. spacing between trees. If hand thinning is done the slash piles should either be piled and burned or removed from the site. Mechanical (grinding) operations would eliminate the need for further slash treatments. The recommended treatment in sagebrush is to use a brush beater to mow 120-150 ft. wide strips. It is also recommended the strips be offset or mowed in a meandering pattern to reduce edge effect.

Mitigation Area Information

- Area #1—This fuel break was moved, at the request of landowners, to public land immediately west of the parcel boundaries. This project involved thinning pinyon/juniper and was partially completed by BLM personnel in the fall of 2004.
- Area #2—This project is on private land; pinyon/juniper; approximately 4 acres; less than 10 degree slope; S/SE aspect; hand thinning
- Area #3—This project is on private land; pinyon/juniper; approximately 4.2 acres; less than 10 degree slope; S/SE aspect; hand thinning.
- Area #4—This project is on public land on the south end of the community. The project was re-designed and extended to MCR 10. This project involved thinning pinyon/juniper and completed by BLM personnel in the fall of 2004.

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- Area #5—This project is on private land on the east side of the community; 14.5-18 acres; less than 10 degree slope; S/E aspect; brush beating.

Wildlife Issues

The fuel mitigation projects are expected to cause minimal soil disturbance and are not expected to negatively impact wildlife habitat. Reducing some of the old-age class fuels should improve habitat for deer, elk, and other species.

Watershed Issues

None of the proposed treatment projects is near a water source. The minimal disturbance associated with the projects should have no impact on the watershed

Appendix G – Glossary

Interface Community: The Interface Community exists where structures directly abut wildland fuels. There is a clear line of demarcation between wildland fuels and residential, business, and public structures. Wildland fuels do not generally continue into the developed area. The development density for an interface community is usually 3 or more structures per acre, with shared municipal services. Fire protection is generally provided by a local fire department with the responsibility to protect the structure from both an interior fire and an advancing wildland fire.

Intermix Community: The Intermix Community exists where structures are scattered throughout a wildland area. There is no clear line of demarcation; wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres. Local fire departments and/or districts normally provide life and property fire protection and may also have wildland fire protection responsibilities.

Occluded Interface: The Occluded Community generally exists in a situation, often within a city, where structures abut an island of wildland fuels (e.g., park or open space). There is a clear line of demarcation between structures and wildland fuels. The development density for an occluded community is usually similar to those found in the interface community, but the occluded area is usually less than 1,000 acres in size. Fire protection is normally provided by local fire departments.

Prescribed Fire: A type of wildland fire – any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and National Environmental Protection Agency (NEPA) requirements (where applicable) must be met, prior to ignition.

Rural Interface: The Rural Interface Community exists in a situation where scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters.

Wildfire: A type of wildland fire – an unplanned, unwanted wildland fire, including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.

Wildland Fire: Any non-structure fire, that occurs in the wildland. There are three kinds of wildland fire, including, wildfire, wildland fire use and prescribed fire.

Wildland Fire Use: A type of wildland fire – the application of the appropriate management response to naturally ignited wildland fires to accomplish specific resource management objectives in predefined designated areas outlined in fire management plans.

Appendix H – References and Resources Used

Community Fire Mitigation Planning – Reference List

Applegate Fire Plan, Applegate Partnership, 2002. <http://www.grayback.com/applegate-valley/fireplan/index.asp>

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Colorado Springs, CO Plan, City of Colorado Springs, Colorado Springs Utilities, 2001. <http://csfd.springsgov.com/wildfiremitigation/pdf>

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Wildfire Hazard Mitigation and Response Plan, Colorado State Forest Service, A Guide, June 1997.

Community Fire Mitigation Planning—Resource List

Moffat County

Bill Mack, Moffat County Road supervisor
Sue Graler, Moffat County Planning Department
Nancy Miles, Moffat County Assessor's Office
Jeff Whilden, Moffat County Road Department
Jeff Comstock, Moffat County Natural Resources Director
Moffat County Commissioners
Moffat County Sheriffs Department

Craig Fire and Rescue Department

Chris Nichols
Byron Willems

BLM

Mike Reiser
Lynn Barclay
Dale Skidmore
Cliff Hutton
Mark Rogers

USFS

Kent Foster
Mark Cahur

State Land Board

Beverly Rave

State Forest Service

Terry Wattles

Imagery

William Whatley, Native Communities Development Corp.
George Greenwood, Digital Globe

Landowners

Over 50 landowners took the time to provide input, participate in tours and attend meetings throughout the planning process.