

**Town of Bearcreek
Town of Bridger
Town of Fromberg
Town of Joliet
City of Red Lodge
Carbon County, Montana**

PRE-DISASTER MITIGATION AND COMMUNITY WILDFIRE PROTECTION PLAN



Town of Joliet, May 2011

***Prepared by Carbon County Disaster and Emergency Services
with assistance from***

**Beck Consulting
Map Murals
AMEC Environment and Infrastructure, Inc.**

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Chapter 5: Community Wildfire Protection Plan (CWPP)

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5.1. Executive Summary

The CWPP was developed simultaneously with the preparation of the county's Pre-disaster Mitigation Plan. The Local Emergency Planning Committee (LEPC) oversaw the preparation of Pre-Disaster Mitigation (PDM) plan, but the specifics in the CWPP were developed by the members of the Carbon County Fire Council with research and writing assistance from the contractor.

Located in south central Montana, the County encompasses 2,060 square miles of land ranging from 3,300 to 12,799 feet above sea level. The variation produces significant diversity in vegetative cover, precipitation, topography, and land use. Land is owned by private individuals, corporations, the state of Montana, local and federal government. Federal lands are managed by the Bureau of Land Management, the US Forest Service, the National Park Service, and the US Fish and Wildlife Service. Five incorporated communities are located in the county; Bearcreek, Bridger, Fromberg, Joliet, and Red Lodge.

Fuel types vary from grasses, to sage brush, to scattered timber, to dense timber depending on aspect and elevation. There is tremendous variety in fuel types and fuel loading across the county. The most extreme situation with respect to fuel conditions and values at risk occurs south and west of Red Lodge where there are numerous high-value individual homes and subdivisions located in the Wildland Urban Interface (WUI) area in close proximity to the National Forest boundary. The WUI poses tremendous risks to life, property and infrastructure in associated communities and is one of the most dangerous and complicated situations faced by firefighters. While only 13% of the County is classified as WUI, a significant amount of development (2,552 structures (37%) and 66 residential subdivisions) has occurred in these areas.

Carbon County has nine rural fire districts which respond to both structure and wildland fires within 76% of the County. The remaining 24% (489 sqmi.) of land in the southeast corner of the County has no formal fire protection. Fire district profiles are included in this CWPP.

A total of 402 fires have occurred on federal lands or have had federal agency response from 1980 to 2011. Thirty seven of these burned over 100 acres in the County during this time period. Approximately 56% had a natural ignition while 38% were caused by human activity. Many other fires have occurred on private lands over the years, but are not well documented. Relatively higher numbers of lightning starts occurred in the Pryor Mountains and the higher mountainous country south and west of Red Lodge. Human-caused ignitions occurred along roadways and near rural residences. Power line ignitions occurred where the lines were exposed to high winds. Railroad ignitions occurred along the tracks in the northern and eastern portions of the county. The county has little history of arson activity.

Fire mitigation goals, objectives and projects were reviewed and ranked as part of this CWPP. Accomplishment of projects will depend on the availability of resources and funding.

5.2. Background

Community Wildfire Protection Plans (CWPP) are authorized and defined in Title I of the Healthy Forests Restoration Act (HFRA) passed by Congress on November 21, 2003, and signed into law by President Bush on December 3. The HFRA is the legislative component of President Bush's Healthy Forests Initiative. Title I of the HFRA authorizes the Secretaries of Agriculture and the Interior to expedite the development and implementation of hazardous fuel reduction projects on federal lands managed by the USDA Forest Service and the Bureau of Land Management, when they meet certain conditions.

The HFRA also emphasizes the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects, and places priority on treatment areas identified by communities themselves in a CWPP. This provides communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal land, as well as how additional federal funds may be distributed for projects on nonfederal lands.

This Community Wildfire Protection Plan was prepared as a part of Carbon County's pre-disaster mitigation (PDM) plan to make the county more disaster-resistant. The plan simultaneously meets requirements for pre-disaster project funding and post-disaster assistance from the Federal Emergency Management Agency to assess risks and vulnerabilities, and identify locally-supported actions that can be taken to reduce the potential for loss and damage in the event of a natural disaster.

The original PDM plan, prepared in 2005, was guided by a CWPP/PDM Steering Committee consisting of local, county, state and federal representatives. The steering committee guided the development of the entire document, while the Carbon Fire Council guided the development of Chapter 5 containing the fire elements of the plan. Participants in the fire planning process included:

- | | |
|---|---|
| <input type="checkbox"/> Belfry, Rural Fire District No. 9 | <input type="checkbox"/> Roberts, Rural Fire District No. 6 |
| <input type="checkbox"/> Bridger, Rural Fire District No. 2 | <input type="checkbox"/> Absarokee, Rural Fire District |
| <input type="checkbox"/> Edgar, Rural Fire District No. 4 | <input type="checkbox"/> Laurel, Rural Fire District |
| <input type="checkbox"/> Fromberg, Rural Fire District No. 3 | <input type="checkbox"/> Bureau of Land Management |
| <input type="checkbox"/> Joliet, Rural Fire District No. 1 | <input type="checkbox"/> Custer National Forest |
| <input type="checkbox"/> Red Lodge, Rural Fire District No. 7 | <input type="checkbox"/> MT Dept. of Natural Resources and Conservation |

The revision of the CWPP involved two meetings of the Carbon County Fire Council (January 19, 2012 in Fromberg and April 19, 2012 in Bridger). Sign-in sheets for the meetings can be found in Appendix A. In between the Fire Council meetings, the planning consultant conducted interviews and had several conversations with participants to obtain input for both the assessment, and the mitigation goals and projects sections.

The area evaluated in this assessment is Carbon County, Montana. The county has nine rural fire districts, five incorporated communities and a number of unincorporated communities. The incorporated communities are the towns of Bearcreek, Bridger, Fromberg, Joliet, and the

City of Red Lodge. For more detailed information about the characteristics of Carbon County please refer to Chapter I of this plan.

5.2.1 Historic Occurrences of Wildland Fires

The newspaper account was located for the largest historic fire in recent memory. This fire occurred in 1948 in the main canyon of Rock Creek south of Red Lodge. The headline in the Carbon County News dated September 19, 1948 read “Disastrous Fire Burning in Red Lodge Canyon.” The article went on to report that the fire started on September 13 and was caused by two careless fishermen. The fire was a reported 7,000 acres at press time. The majority of the upper canyon was burned including timber and cabins. The Richel Lodge and Lions Camp on the Lake Fork were endangered and smoke was drifting over the Beartooth Highway making driving difficult. On September 21, the News reported the fire was under control “after extensive damage.”

5.2.2 Federal Fire Occurrence Database

The Federal Fire Occurrence Website (US Geologic Survey, 2012) is a government website that provides users with the ability to query, view and download wildland fire occurrence data. The Website contains over 630,000 fire records collected by Federal land management agencies for fires that occurred from 1980 through 2010 in the United States. The location and size of these fires in Carbon County are shown in Figure 5-1 in combination with major fire perimeters from GeoMAC (Geospatial Multi-Agency Coordination Group (GeoMAC), 2012). This map does not reflect fires that occurred on private lands where only the rural fire departments responded.

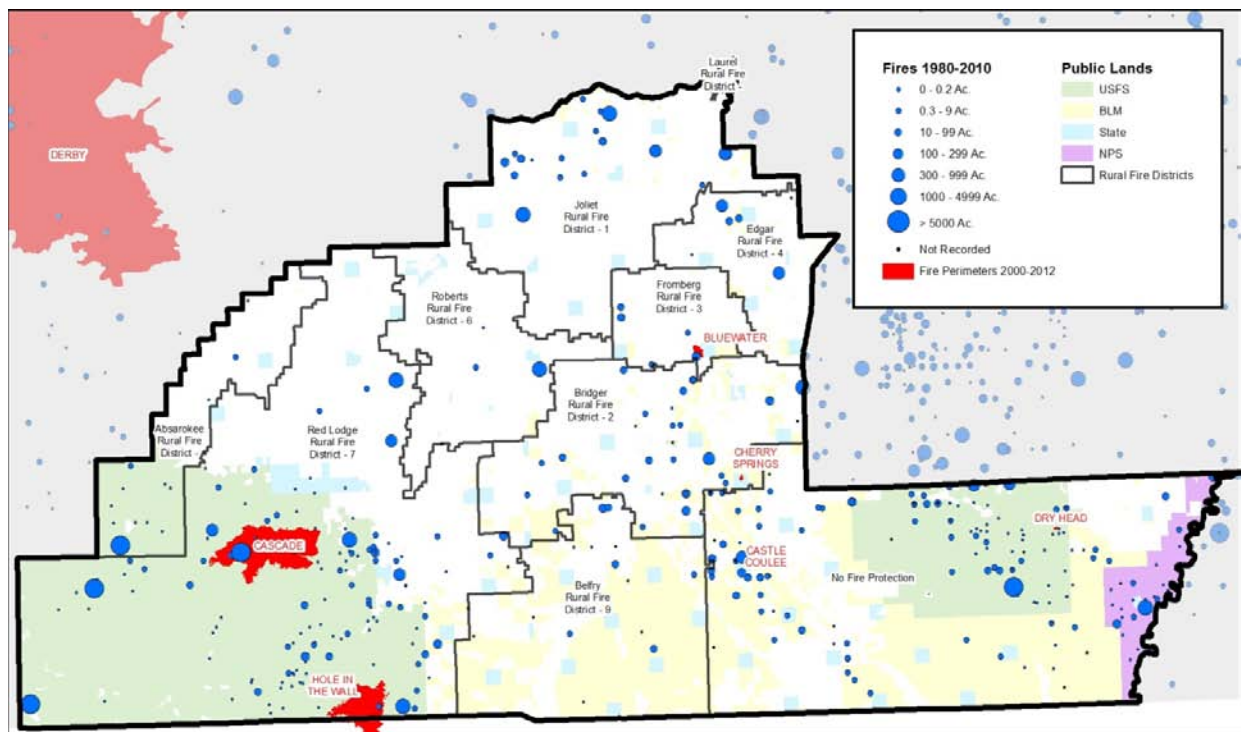


Figure 5-1. Map of Carbon County showing historical fire locations and perimeters in relation to rural fire districts and public lands.

Combing the Federal Occurrence Website data with 2011 data from the Custer National Forest, a total of 402 fires have occurred on federal lands or have had federal agency response from 1980 to 2011. Table 5-1 lists the 37 fires that burned over 100 acres in the County during this time period based on these two sources of information.

Of the 402 fires that occurred in the County, approximately 56% had a natural ignition while 38% were caused by human activity (7% were not classified).

Table 5-1. Fires in Carbon County in excess of 100 acres between 1980-2010 (US Geologic Survey, 2012)

AGENCY	FIRE	CAUSE	YEAR	ACRES	FIRE DISTRICT
FS	HOLE IN THE WALL	Natural	2011	3,777	Red Lodge Rural Fire District
BLM	BLUEWATER	Human	2010	274	Fromberg Rural Fire District
BLM/FS	ANTELOPE	Human	2009	100	
BLM	DRY CREEK	Human	2009	222	Belfry Rural Fire District
FS	LARKIN MUTUAL AID	Natural	2009	131	Red Lodge Rural Fire District
FS	SILESIA ASSIST	Human	2009	500	Joliet Rural Fire District
FS	CASCADE	Human	2008	10,173	Red Lodge Rural Fire District
FS	ROCK QUARRY	Natural	2008	300	Edgar Rural Fire District
BLM	421	Human	2007	200	Joliet Rural Fire District
BLM/FS	FAREWELL	Human	2007	521	Joliet Rural Fire District
FS	COLE CREEK	Natural	2006	1,000	Joliet Rural Fire District
BLM	PIPELINE	Natural	2006	200	Bridger Rural Fire District
FS	SHANE RIDGE	Natural	2006	1,000	Joliet Rural Fire District
FS	TURKEY	Human	2006	410	Red Lodge Rural Fire District
NPS	E TRAIL CR	Human	2005	1,500	
BLM/FS	RED WAFFLE	Human	2002	5,859	
BLM	SORENSEN	Human	2001	175	
BLM	WILLIE	Human	2000	1,503	Red Lodge Rural Fire District
BLM	CARBONCOAS	Human	1999	500	Edgar Rural Fire District
BLM	GOLD CRK	N/A	1999	190	Red Lodge Rural Fire District
BLM	CHERRY SPG	Natural	1998	2,000	Roberts Rural Fire District
BLM	DEPRESSION	Human	1998	200	
FS	PARKSIDE	Human	1998	133	Red Lodge Rural Fire District
BLM	SURPRISE	Human	1997	100	Bridger Rural Fire District
BIA	CABINS	Human	1996	430	
BIA	HOLEINROCK	Natural	1996	200	
FS	SHEPARD MTN	Natural	1996	14,890	Absarokee Rural Fire District
BLM	VIADUCT	Human	1996	230	
BIA	CROWN BUTTE	Natural	1995	700	
BLM	WEST PRYOR	Natural	1995	1,800	Bridger Rural Fire District
BLM	BRIDGER	Human	1991	200	Bridger Rural Fire District
BLM/FS	ROBERTSON DRAW	Human	1991	4,360	Red Lodge Rural Fire District
FS	UNNAMED	Human	1990	204	Red Lodge Rural Fire District
FS	UNNAMED	Natural	1990	910	Red Lodge Rural Fire District
BLM	AGAIN	Human	1989	300	
FS	CLOVER/MIST	Human	1988	387,400	Red Lodge Rural Fire District
BLM	BOWLER FIR	Human	1983	650	Bridger Rural Fire District

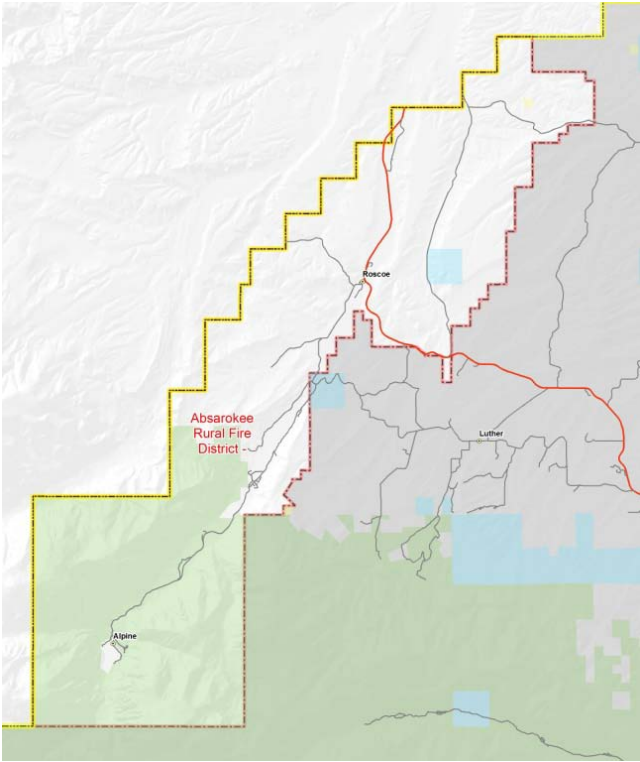
5.3. Fire Districts and Community Assessments

Carbon County has nine Rural Fire Districts (RFD) which respond to both structure and wildland fires within 76% of the County. The remaining 24% (489 sq. mi.) of land in the southeast corner of the County has no formal fire protection. Primary fire response for two of the districts comes from outside the County. Mutual aid agreements are in place between the County and Laurel and Absarokee RFD to support cross-boundary response.

The following “profiles” summarize key information for each RFD. Specifically, the profiles list the station contact information and address, the number of paid positions/volunteers in the RFD, the area covered and the number of structures within the RFD, population estimates from the 2010 census, the Insurance Services Office (ISO) rating, and a summary of land ownership.

5.3.1 Absarokee Rural Fire District

Fire District Profile	
Station Address	PO Box 302 105 W B St Absarokee, MT 59001
Substations	N/A
Fire Chief	Tim Zumbrum
Paid Positions	N/A
Volunteers	19 (11 active)
Area Served	64,904 Ac / 101 SqMi
Population	153
Structures	258
ISO Rating	6 in Absarokee; 8 for residences 2-5 miles out; 10 elsewhere in District
Land Ownership	57% Private, 42% Federal, 1% State



The map displays the geographical boundaries of the Absarokee Rural Fire District. The district's area is outlined with a yellow border, while its sub-boundaries are marked with a red dashed line. Key locations shown include Roscoe, Luther, and Alpine. The terrain is depicted with green and grey shading, and a red line indicates a boundary or road. The text 'Absarokee Rural Fire District' is printed in red on the map.

Fire protection responsibility for this District is contracted with the Absarokee Fire Department in Stillwater County. This area includes the unincorporated community of Roscoe (population 15), the Black Butte Subdivision, the private and state-owned lands north of the Forest Service boundary, and the upper end of Butcher Creek north of State Highway 307.

Ownership of the land in the District is mostly private (57%) and federal (42%) which is managed by the US Forest Service.

The East Rosebud drainage and the Alpine area within the Forest Service boundary, which includes homes around East Rosebud Lake, have no formal fire protection for structures. The Custer National Forest has the primary wildland fire protection responsibility in this area under Affidavit Agreements with the various landowners (Kurk, 2004).

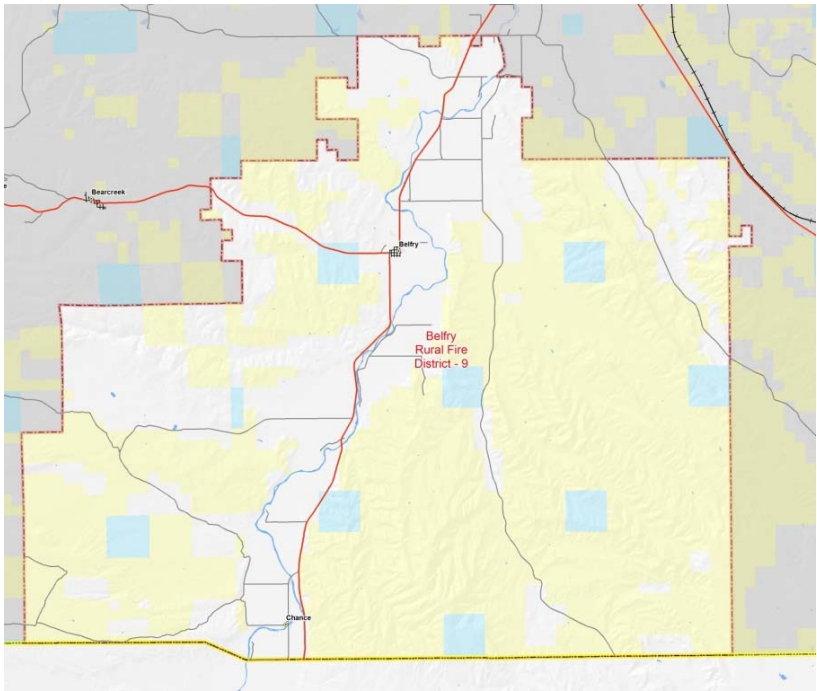
Challenges in providing protection come from the steep terrain, poor access, and heavy fuels in the southern end of the district, the East Rosebud. There is only one road in and out and the road is not well maintained. Many of the residential subdivisions in this area have limited egress and some access roads have limited bridge capacity (Zumbrun, 2012).

This district has wildland urban interface issues along the face of the Beartooth Front and National Forest boundary. According to the former Chief, the homes in the interface are difficult to protect because they have difficult access and heavy fuels (Noe, 2004). It is important that fuels mitigation continue on US Forest Service lands adjacent to private property (Zumbrun, 2012). Zumbrun also felt that homeowners in the area were doing an adequate job of creating defensible space around their private residences.

By contrast, the Butcher Creek drainage fuels consist of grasses that are cropped by domestic livestock (Noe, 2004). Average annual precipitation in the area is 18 to 20 inches. Risk of ignition within Roscoe is low. Risk of ignition outside of the community is medium to high (Noe, 2004).

5.3.2 Belfry Rural Fire District 9

Fire District Profile	
Station Address	PO Box 66, 100 State St Belfry, MT 59008
Substations	N/A
Fire Chief	Greg Maddox
Paid Positions	N/A
Volunteers	13
Area Serviced	126,115 Ac / 197 SqMi
Population	512
Structures	263
ISO Rating	6
Land Ownership	60% Federal, 35% Private, 4% State



Belfry Rural Fire District #9, located in Belfry, protects the community of Belfry (population 218) and surrounding rural residences. It also protects the Elk Basin industrial area located south and east of Belfry. Elk Basin is an oil producing area that contains an Exxon tank battery.

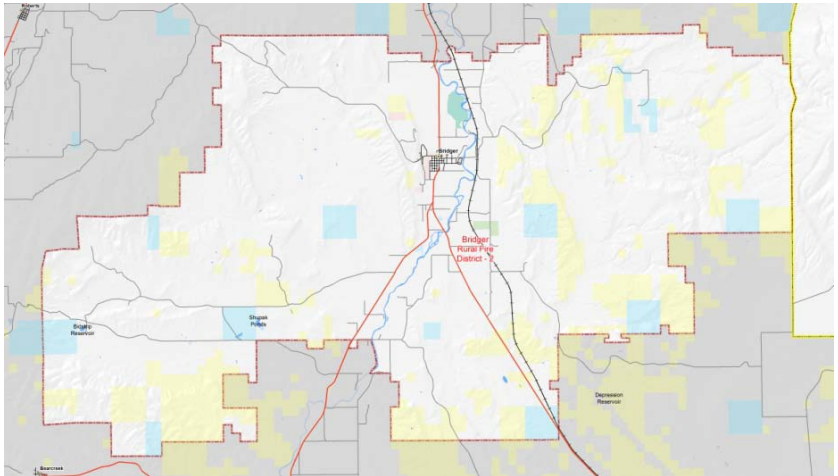
Belfry is an unincorporated area situated in the south end of the county along the Clarks Fork River and at the intersection of Highways 72 and 308. Much of the area surrounding the community is irrigated agricultural land. Fuels in the area outside of the community and out of the river valley bottom are grasses and sagebrush. The river bottom has scattered cottonwoods and brush. Average annual precipitation for the Belfry area ranges from less than 6 to 8 inches.

The federal government, under the management of the Bureau of Land Management (BLM) owns 60% of the land in the district. Lands owned by the State of Montana account for 4%. The remaining 35% is in private ownership.

Ignition concerns for this area of the county include lightning strikes in late summer when vegetation is dry, escaped fires from ditch burning by landowners in the spring, and starts along the highway. The risk of Ignition within the community is low. However, in areas outside the community risk of ignition is medium (Maddox, 2004).

5.3.3 Bridger Rural Fire District 2

Fire District Profile	
Station Address	PO Box 60 200 E Carbon Ave Bridger, MT 59014
Substations	N/A
Fire Chief	Vern Adkins
Paid Positions	N/A
Volunteers	25
Area Served	122,860 Ac / 192 SqMi
Population	1,274
Structures	625
ISO Rating	4 or 5
Land Ownership	79% Private, 15% Federal, 5% State



Bridger Rural Fire District #2 includes the incorporated town of Bridger which is situated in the Clarks Fork Valley along Highway 72. The population of Bridger in the 2010 census was 708, down 5% from 2000. Much of the immediate surrounding area is irrigated and in agricultural production. Where the area is not farmed near the town, the fuels are limited to grasses.

Drought and wind conditions can contribute to increased severity of wildland fire. Average annual precipitation for the area is between 10 and 14 inches.

The volunteer department, located in Bridger, protects both the town and surrounding area. Within town, there is a bulk fuel plant, restaurants, a commercial area, and residences. In addition to the town, the Bridger Department protects the bean elevator east of town, the Eagle Nest Estates Subdivision, the state fish hatchery in Blue Water Creek, rural residences, farm and ranch residences, outbuildings, and the airport. Risk of ignition within and immediately surrounding the community is low.

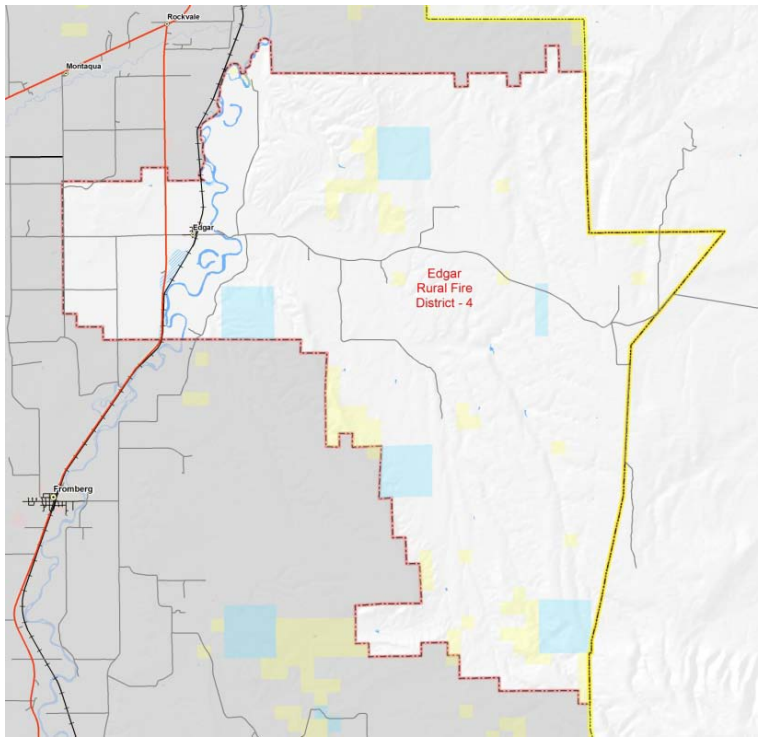
Land ownership within the District consists of 79% private, 15% federal (BLM) and 5% state.

East of the District, are lands that are not included in the coverage responsibility of any department. Over 70% of the land in this “unprotected” area is owned by the federal government (US Forest Service, BLM and National Park Service) and State of Montana.

According to Chief Adkins, his department will respond when a fire is reported in this uncovered area. He reports that because there are few fires in this area it does not represent a major concern for him (Adkins, 2005).

5.3.4 Edgar Rural Fire District 4

Fire District Profile	
Station Address	PO Box 14, 222 N Railway Ave Edgar, MT 59014
Substations	N/A
Fire Chief	Dave Wetstein
Paid Positions	N/A
Volunteers	12
Area Serviced	49,771 Ac / 78 SqMi
Population	250
Structures	124
ISO Rating	9
Land Ownership	89% Private, 5% Federal, 5% State



The map displays the geographical boundaries of Edgar Rural Fire District 4. The district's perimeter is outlined in red, with a yellow line indicating a specific boundary or sub-section. Key locations marked on the map include Montiqua, Rockvate, and Cronberg. The terrain is shown with topographic contours, and various colored areas (blue and yellow) represent different land ownership types or features within the district's service area.

The Edgar Rural Fire District #4 maintains a volunteer department located in Edgar and has protection responsibility for the unincorporated town of Edgar, rural structures, a fertilizer plant east of Edgar, and the Express Pipeline and pumping station. Edgar (population 114) is

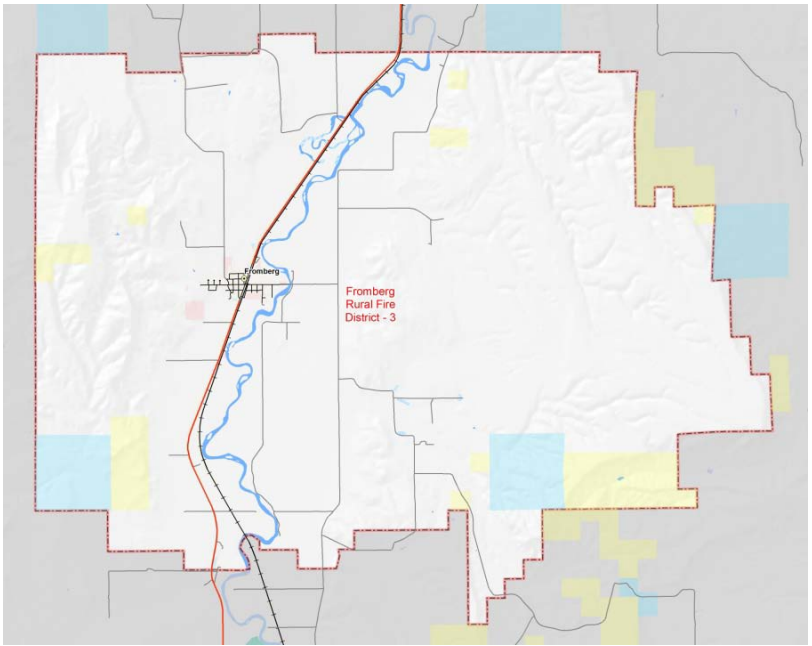
situated on the Clarks Fork River and State Highway 310. The town itself is well-protected from wildland fire by farm ground (Wetstein, 2004). With the exception of cottonwoods along the river bottom, there is not much timber in the district. Fuels consist of grasses and brush. In many areas the fuels have accumulated due to the fact that lands are enrolled in the Conservation Reserve Program (CRP.) Except under emergency conditions, lands enrolled in CRP are not grazed or hayed. Average annual precipitation in Edgar is 10-14 inches.

Land ownership in the District is predominantly private (89%), with some scattered State (5%) and BLM (5%) lands.

Providing fire protection in many locations in the district is a challenge owing to the difficulty of finding physical access across open land with broken terrain. The department has also had difficulty recruiting adequate numbers of personnel. Risk of ignition within and surrounding the community is low (Wetstein, 2004).

5.3.5 Fromberg Rural Fire District 3

Fire District Profile	
Station Address	PO Box 194 Physical... Fromberg, MT 59029
Substations	N/A
Fire Chief	Gary Hart
Paid Positions	N/A
Volunteers	10
Area Serviced	35,624 Ac / 56 SqMi
Population	745
Structures	376
ISO Rating	9
Land Ownership	90% Private, 4% Federal, 4% State



The map displays the geographical layout of Fromberg Rural Fire District - 3. A red dashed line delineates the district's irregular boundary. The Clarks Fork River is shown as a blue line winding through the center of the district. The terrain is depicted with a grayscale relief map, showing a mix of flat and hilly areas. Several colored patches (yellow and light blue) are scattered across the district, likely representing different land ownership types or vegetation zones. A small cluster of buildings and a road are visible near the center, representing the town of Fromberg. A legend in the bottom right corner of the map area identifies the district as 'Fromberg Rural Fire District - 3'.

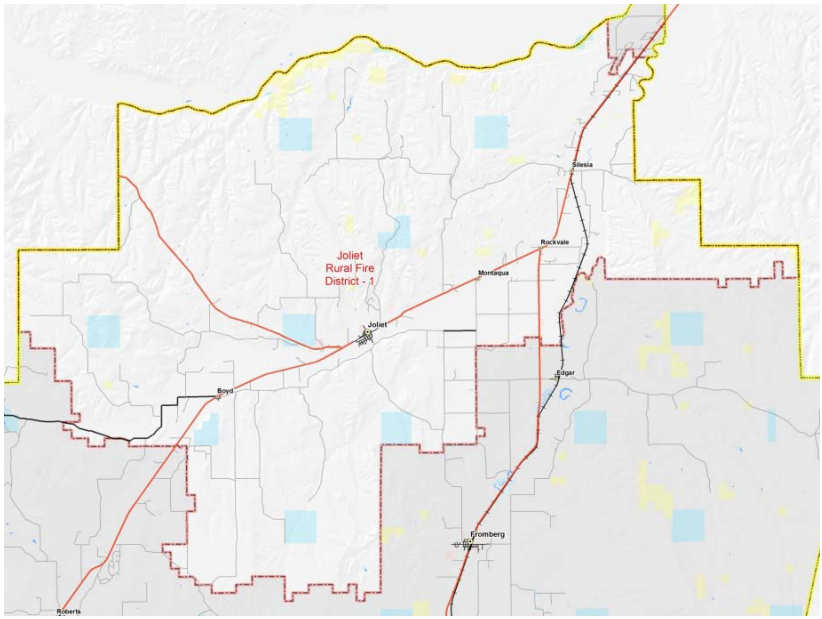
Fromberg Rural Fire District #3, a volunteer department located in Fromberg, provides protection for the town of Fromberg, a grain elevator, and along the BNSF railroad tracks. The population of Fromberg decreased 10% to 438 residents from 2000 to 2010. The town is situated along the Clarks Fork River and Highway 310. The town itself is protected from wildland fire by farm ground. Average annual precipitation is 10-14 inches. Access across some farm land is difficult due to irrigation ditches, pipelines, and saturated soils. Lands to the east and west of town that are out of the river bottom are rough, difficult to access, and contain light flammable fuels. The severity is enhanced by persistent winds.

Land ownership in the District is predominantly private (90%), with some scattered BLM lands (4%) and two State school sections (4%).

Of particular concern in this area of the county is the ditch, weed, and stubble burning done annually by landowners. Not all landowners are attentive to their burns and some escape. The railroad also is a source of ignitions in this district. Risk of ignition in the town of Fromberg is low (Hart, 2004).

5.3.6 Joliet Rural Fire District 1

Fire District Profile	
Station Address	PO Box 60 200 E Carbon Ave Bridger, MT 59014
Substations	Silesia
Fire Chief	Melvin Hoferer
Paid Positions	N/A
Volunteers	20
Area Serviced	135,537 Ac / 212 SqMi
Population	2,172
Structures	1029
ISO Rating	9
Land Ownership	93% Private, 4% State, 2% Federal



The protection responsibilities of the Joliet Rural Fire District #1 include the incorporated town of Joliet (pop. 595); the communities of Boyd (pop. 35), Silesia (pop. 96); Rockvale; Major subdivisions including the Grill, Bridal Trails, and Evergreen; Klammerts Railroad Tie Yard, agricultural chemical operation and airstrip; residences along Rock Creek, residences in scattered pines on the western edge of the county on Ortiz Lane, and the railroad tracks along the Clarks Fork.

Private lands are dominant (93%) with a small percentage of State (4%) and BLM (2%) lands present.

The fuel situation in the district is mixed. Most of the subdivisions and communities are near green, irrigated cropland along river/creek bottoms. Average annual precipitation in the general area is 10-14 inches. Residential development north and west of Joliet (including Ortiz Lane) is situated in the hills with scattered Ponderosa pine and is considered WUI. Little or no water is available in this area.

The Grille Subdivision just west of Joliet is grassy, rolling hills with a few scattered pine trees. Poor access exists in the Shane Ridge area along Highway 421 between Joliet and Columbus and response time can be as long as 45 minutes. Shane Ridge is prone to lightning strikes. There is also poor access from Cooney Reservoir north to the Yellowstone River due to terrain and vegetation. Southwesterly winds can contribute to severity of fire behavior. Risk of ignition in and immediately surrounding the community is low. Risk of ignition in more distant areas of the protection district is medium.

The volunteer department has stations in Joliet and Silesia. One staff covers both stations. The department experiences a shortage of available personnel during daytime working hours (Hoferer, 2004).



Figure 5-2. Picture of ponderosa grassland vegetation along Highway 421

5.3.7 Laurel Rural Fire District

Fire District Profile	
Station Address	215 W. 1st St. Laurel, MT 59044
Substations	N/A
Fire Chief	Brent Peters
Paid Positions	0
Volunteers	42
Area Serviced	1,858 Ac / 3 SqMi
Population	279
Structures	107
ISO Rating	7 within 5mi of Laurel; 10 outside 5miles
Land Ownership	~ 100% private

This district covers the extreme north end of the county and receives its protection by agreement from the City of Laurel. The department has 34 volunteers. The protection responsibility includes just over a 100 rural residences. Highway 212 carrying a large volume of traffic, and the BNSF railroad tracks pass through this protection district. The highway and railroad tracks are together responsible for a large number of fire department call outs. The district is bounded by the Clarks Fork River on the east and the Yellowstone River on the northwest.

The wildland fuels consist primarily of grasses and the terrain is relatively easy to access. Long-term drought conditions and high winds can increase the severity of wildland fire incidents in the district. Average annual precipitation in the area is 12-14 inches. Risk of ignition in this area is medium owing to the railroad and highway (Wilm, 2004).

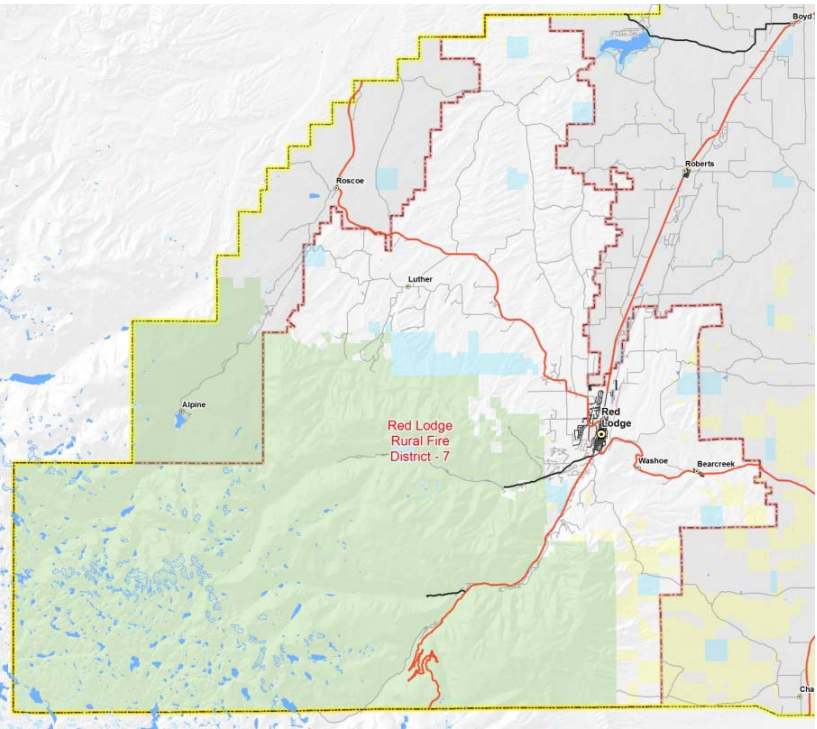
Four major residential subdivisions (Country View Estates, Rocky Point, Whitehorse, Beartooth View Estates and Krug) have been developed in this District and are approaching capacity. Some of these developments include underground 10,000 gallon dry hydrant tanks for fire protection.

Because of the proximity of the area to Billings, the amount of undeveloped land, the general suitability of the land for development, and a proposed state highway improvement, more development can be anticipated in this area in the future. Major and minor subdivisions proposed in the future will be reviewed for compliance with the county subdivision regulations. The county subdivision regulations address the ability to provide fire protection.

Overall, there have been very few fire calls or problems in this area (Peters, 2012). One of the biggest challenges involves communication and coordination between Carbon and Yellowstone Counties related to control burns. Laurel is moving toward an online burn permit system that will hopefully improve communications (Peters, 2012).

5.3.8 Red Lodge Rural Fire District 7

Fire District Profile	
Station Address	PO Box 318 801 N Broadway Ave Red Lodge, MT 59068
Substations	Luther and Bearcreek
Fire Chief	Tom Kuntz
Paid Positions	4 fulltime (fire & EMS), ¼ time (Fire Chief)
Volunteers	40
Area Served	386982 Ac / 605 SqMi
Population	3,535
Structures	2,890
ISO Rating	City 5, Rural ≤5 mi radius from Red Lodge 8, Rural > 5 mi radius 9
Land Ownership	60% Federal, 36% Private, 3% State



With over 600 square miles, the Red Lodge Rural Fire District #7 is the largest of all districts in the County. The majority of the land is owned by the federal government (58% US Forest Service, 2% BLM). Private lands account for 36% while lands owned by the State of Montana total 3%.

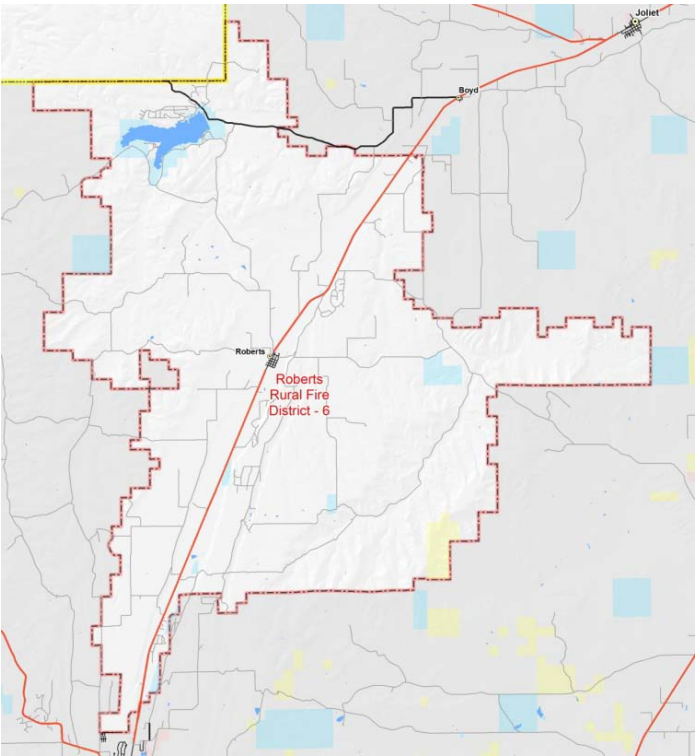
The protection responsibilities for the District include the city of Red Lodge (pop. 2,125), the incorporated town of Bearcreek (pop. 79), the unincorporated town of Luther, Red Lodge Mountain Ski Area, the Red Lodge/Carbon County airport, agricultural lands, numerous individual residences and major subdivisions south and west of Red Lodge along the Beartooth Front, and residences and subdivisions north of Red Lodge. The department currently has four fulltime employees (fire and EMS) and up to three full or half-time positions covered by grant money. A ¼ of the fire chief's time is also covered. The fire station is located at the north end of Red Lodge. Substations exist in Luther (One type 5 engine and a water tender) and Bearcreek (type 2 engine).

A number of factors increase the severity of wildland fire behavior in this area of the county. Steep south, east, and west-facing slopes and canyons with light, flammable fuels down low and dense mature lodgepole pine above provide the opportunity for high intensity fire with extreme fire behavior. The area frequently experiences strong winds. Typical summer weather patterns produce extended periods of high winds, high temperatures, low humidity, and no precipitation. Average annual precipitation in the area ranges from 18 to 30 inches.

Because of the pattern of the National Forest boundary, there is a long distance of forest frontage with fuels varying from grass to heavy timber. There are a significant number of residential assets, some worth several millions of dollars located in these wildland urban interface areas to which access can be difficult and time consuming, and for which there are no water sources located in close proximity.

5.3.9 Roberts Rural Fire District 6

Fire District Profile	
Station Address	PO Box 196 5 S First St Roberts, MT 59070
Substations	N/A
Fire Chief	Hunter Bell
Paid Positions	N/A
Volunteers	14
Area Served	82,442 Ac / 129 SqMi
Population	1123
Structures	723
ISO Rating	Town=7, 5 mi. from Roberts=8B, Rural=10
Land Ownership	96% Private, 2% State, 1% Federal



The Roberts Rural Fire District #6, an all-volunteer force with a fire station located in Roberts, protects the unincorporated community of Roberts and surrounding agricultural lands and rural residences. Roberts has a population of 361 and consists of residences, a small commercial district, a gas station, school, and fertilizer company. Additional developed areas and assets include Cooney State Park (recreational infrastructure and homes), the grain elevator at Fox, a gas pipeline, rural residences, agricultural lands, state sections, and BLM land (upon which the RFD assists the BLM.)

Lands within the District are almost all private (96%) with a small scattering of State (2%) and BLM lands (1%).

In general, fuels are light, fine and flashy in the district. On the east side of the district there is rocky, steep terrain along the Roberts-Bridger Road. Southeast of Roberts is the “big slide”, another steep area with broken terrain. A small amount of timber is scattered around the district. Scattered pine and sagebrush are found along Elbow Creek and at Cherry Springs. Wheat stubble is another fuel found in the district. Average annual precipitation in the area is

14 to 16 inches. Risk of ignition in the community is low. Risk of ignition in other areas of this district is medium.

Some residences in the district take 20 minutes to reach and water supply is a problem in most areas of the district. Access is a severe problem with respect to two areas within the district. The bridges to reach Western Ranch Estates I and II are inadequate to hold the fire apparatus and access must be obtained across a pasture if physically possible (Figure 5-3). An additional residential area south of Roberts on the east side of Highway 212 also has access unable to accommodate fire apparatus. At this location, due to the terrain (against the base of the east bench to the east and across Rock Creek to the west) there is no secondary means of access and the area is totally without fire protection.

The number of volunteers with the department is holding steady or increasing.



Figure 5-3. Picture of access across Rock Creek to Western Ranch Estates Subdivision

5.3.10 Unprotected Areas of County

The southeast section of Carbon County is not currently within any rural fire district. However, Bridger RFD often responds voluntarily to fires in this area. The area covers 489 square miles and is predominantly in federal or state ownership (71%). Included in this area are the Pryor Mountains managed by the US Forest Service, The Pryor Mountain Wild Horse Range managed mostly by the BLM, and the Big Horn Canyon National Recreation Area managed by the National Park Service.

The County Commissioners are considering adding this area to an existing district or creating a new one to create uniform fire protection throughout the County. Doing so would encompass approximately 140 landowners and 32 residential structures. Several of these structures are concentrated in the Sage Creek area, a private in-holding within the Custer National Forest. A new fire district would also help protect several industrial facilities associated with oil, gas and the limestone quarry.

5.4. Assessment of Fuel Hazard

5.4.1 Vegetative Fuels

Carbon County reaches from 3,700 feet to nearly 13,000 feet in elevation. The variation produces significant diversity in vegetative cover, precipitation, topography, and land use.

The northern border of the county follows the Yellowstone River. These rough terrain breaks are difficult to access. Vegetation consists of grasses with scattered pine and brushy draws. Native vegetation is confined to the steep coulees. Moving to the south and away from the river, the topography becomes more moderate rolling hills that are more accessible, less timbered, and more likely to be in agricultural production.

The central area of the county is dominated by the Rock Creek and Clarks' Fork River Valley bottoms. Floodplain areas contain woody brush and cottonwoods. The major communities in the county are situated in these two valleys and largely insulated from catastrophic fire by surrounding agricultural lands. The grass fuels tend to be relatively sparse and short due to grazing so that fire spread would be limited unless significant winds were present. The combination of farming and stock grazing in the central portions of the county has led to a landscape that is generally low potential for wildfires.



Figure 5-4. Picture of 2002 Red Waffle Fire, Pryor Mountains

The Pryor Mountain Range comprises the eastern-most portion of the county. Elevations range from 4500 to 8800 feet above sea level. Vegetation varies with elevation and aspect but high elevation areas contain patches of dense Douglas fir and ponderosa pine with scattered pine and open meadows. Lower elevations are covered primarily with grass and sagebrush. Draws contain timber at higher elevations and brush down low. The lands are used for domestic and wild horse pasture, recreation, minerals, and oil and gas production. The residences that do exist in the area on private land are mostly along the Sage Creek drainage. The potential for wildfires in the Pryor Range is significant although the values at risk are less than in other more densely-populated areas of the county.

The Beartooth Mountain Front lies in a band circling the southwest corner of the county. This area is covered in lodgepole pine stands that are 100-120 years old. This area is ripe for a wind-driven stand-replacing fire. A fire started in this area would be expected to produce large flame lengths that could loft fire brands a great distance. Numerous factors add to the complexity of the situation. First, there are many rural subdivisions and individual homes built

against the front area, many of these without defensible space. Second, the area contains the Red Lodge Mountain Ski area (Carbon County's largest private employer.) Third, much of the area is not readily accessible, and there is only one road in and out of the West Fork drainage. Fourth, the West Fork is a steep-walled canyon creating conditions where rapid spread would be likely. Fifth, lightning activity can be high in the area. Sixth, evidence of the long-term drought is manifesting in the presence of stressed and dead trees. And, finally, there is a large amount of vehicle traffic, developed, and dispersed recreational activity during fire season. A stand-replacing fire in the West Fork of Rock Creek could have extremely disastrous consequences which could likely include loss of multiple human lives, not to mention large scale property and economic loss.

The extreme south central and south western portions of the county are comprised of higher elevation plateaus for the most part above timberline. The lands are publicly-owned and managed by the Forest Service. There are no residences in this area of the county. Fire starts in this area, however, could easily pose a threat to recreationists who happen to be in the area and down-canyon private and public assets such as residences, recreational developments, communications equipment on Grizzly Peak, and the Red Lodge Mountain ski area. The West Fork of Rock Creek provides one of three sources of water for the city or Red Lodge, and is the site of the municipal water treatment facility located in the creek bottom.

Fuel Modeling

Vegetation types in the US have been classified into fuel models to serve as input to mathematical surface fire behavior and spread models. A total of 13 models are defined and organized into four broad groups: grass, shrub, timber, and slash (Albini, 1976) (Anderson, 1982). Map 5.2 shows the distribution of these four primary groups in addition to agricultural areas, urban areas, water and areas void of fuel (snow, ice, barren). This map was produced through a series of workshops held across the nation with fire and fuels specialists to determine surface fuel model rule sets using unique combinations of existing vegetation type, cover, and height (USDI - US Geologic Survey, 2008). Figure 5-5 was used as a basis for delineating the WUI for the County as described in section 5.6.

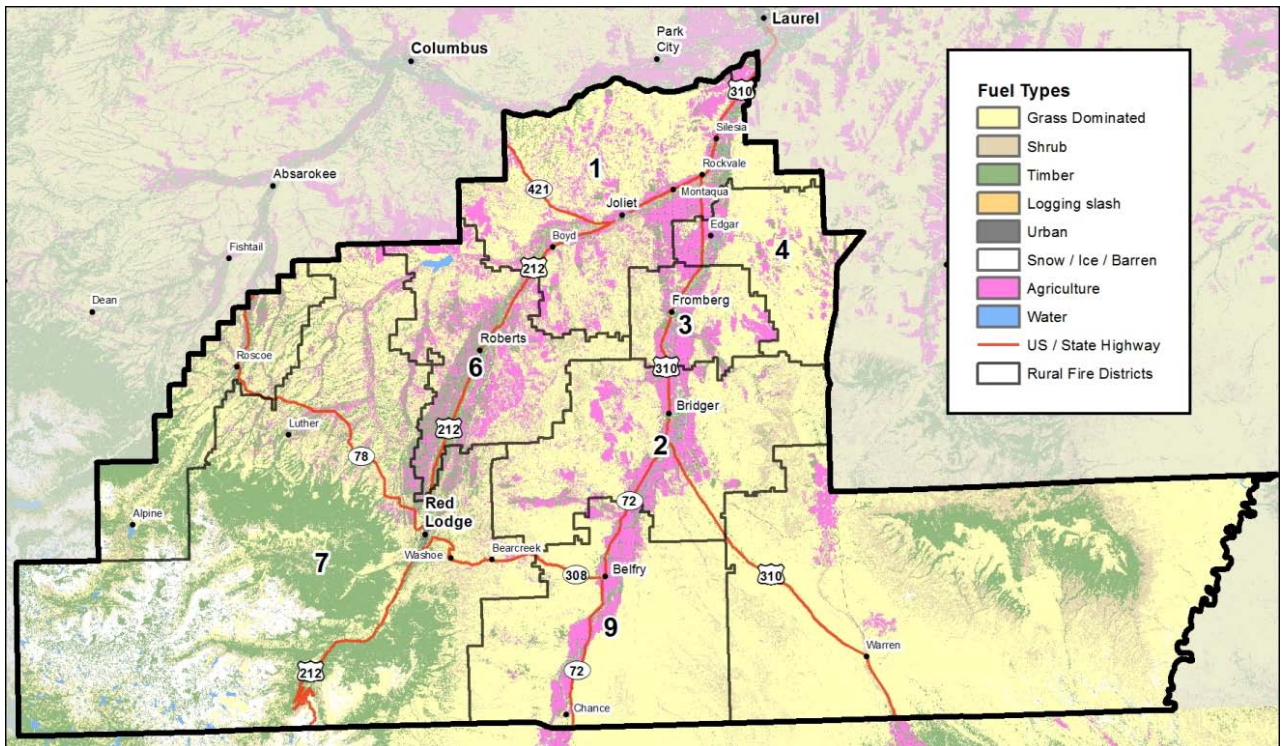


Figure 5-5. Map of Carbon County showing basic fuel models as defined by Albini, 1976 and Anderson, 1982.

5.4.2 Structural Fuels

For the most part, structural fuel hazards are located within or in close proximity to the various communities and along the major drainages of Rock Creek, the Clarks Fork and East Rosebud Creek (Figure 5-6). These drainages are also major transportation corridors supporting both US and State Highways. The primary exceptions to this general rule include the structures at Red Lodge Mountain, the structures at the Timbercrest Girl Scout Camp west of Red Lodge, the structures at Westminster Spires Church Camp and Lions Camp south of Red Lodge, the Yellowstone Bighorn Research Association Camp, Cabin Home areas in the Custer National Forest and homes situated near Cooney Reservoir. Human activity at these sites whether it be recreation or commercial creates the potential for fire starts.

A large number of individual part-time and full-time residences and a number of major subdivisions south and west of Red Lodge are at significant risk from wildland fire. These properties are located along the Beartooth Front, in the West Fork of Rock Creek, and in the Main Canyon of Rock Creek.

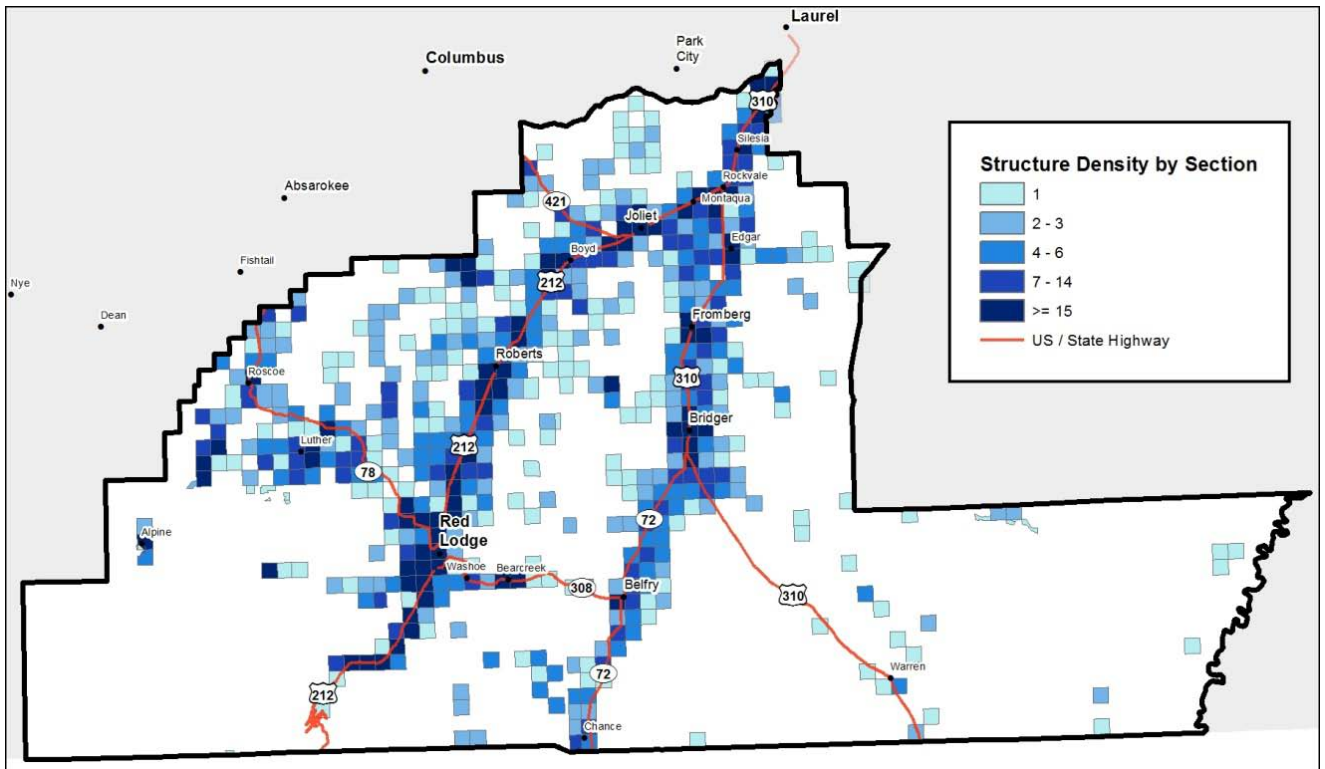


Figure 5-6. Map of Carbon County showing density of structures summarized by public land survey section (1 sqmi.)

According to the 2012 census, there are 6,441 housing units in Carbon County. For the period 2006-2010, 4.9% of these units were in multiple unit structures. The median value for owner occupied housing units for this same period was \$200,700.

The construction material used to side and roof a structure is an important factor in determining its flammability. The Montana Department of Revenue’s Computer Assisted Mass Appraisal (CAMA/ORION) database identified 6,195 residential housing units in the County (excluding mobile homes and commercial units). Of these, 37% are constructed with flammable wood siding or sheathing, while nearly 11% of homes are constructed with flammable wood shade or wood shingle construction (Table5-2).

Table 5-2. Roofing material and exterior siding on housing units in Carbon County

Roof Material	Housing Units	Percentage	Exterior Wall Finishing	Housing Units	Percentage
asphalt shingle	3843	62.0%			
metal	1155	18.6%	wood siding or sheathing	2292	37.0%
composition roll	430	6.9%	masonite	1186	19.1%
wood shake	356	5.7%	aluminum/vinyl/steel	1094	17.7%
wood shingle	309	5.0%	other	1027	16.6%
slate	37	0.6%	asbestos	207	3.3%
other	27	0.4%	shingle	171	2.8%
built up tar/gravel	17	0.3%	stucco	159	2.6%
asbestos	13	0.2%	brick	39	0.6%
tile	4	0.1%	block	13	0.2%
copper	4	0.1%	stone	7	0.1%
TOTAL	6195	100.0%	TOTAL	6195	100.0%

5.5. Wildland Urban Interface

This Wildland Urban Interface or WUI poses tremendous risks to life, property and infrastructure in associated communities and is one of the most dangerous and complicated situations faced by firefighters. It is estimated that as many as 38% of new home construction in the western U.S. is adjacent to or intermixed with the WUI. (U.S. Fire Administration, 2002). WUI fires pose great challenges to fire fighters primarily because access to homes and availability of water are often limited in the WUI. Fire prevention programs such as fuel reduction initiatives and home assessment in WUI areas are extremely important. Homeowners must accept a measure of responsibility and be fully aware of the risks when deciding to locate in such an environment.

5.5.1 WUI Definition

In 2001, the Federal Register (Vol. 66, No. 3) defined the WUI community as any place “*where humans and their development meet or intermix with wildland fuel.*” The Federal Register goes on to describe three community categories:

Interface Community: where structures directly abut with Wildland Fuels (3 or more structure per acre);

Intermix Community: where structures are scattered throughout a wildland area (1 or more structures per 40 acres);

Occluded Community: where structures abut an island of wildland fuels (often in a city, e.g. park or open space).

The WUI situation in Carbon County most closely resembles the Intermix Community category although most areas have a structure density less than one per 40 acres. Despite the low density, fire managers are still concerned about these areas because of public and firefighter safety and because of the unique fire suppression tactics that must be deployed.

In 2001, six communities were identified as “urban wildland interface communities within the vicinity of federal lands that are at high risk from wildfire” (United States of America, 2001). These communities were Belfry, Bridger, Edgar, Joliet, Red Lodge and Roberts. Pursuant to direction from Congress, the lists submitted by States and Tribes have been annotated by the Secretaries to identify communities around which hazardous fuel reduction treatments on Federal lands are ongoing or were planned to begin in fiscal year 2001.

5.5.2 Mapping the WUI

The Federal Register also provided some criteria to consider when delineating WUI:

- Fire behavior potential situations
 - Crown fire or high intensity surface fire potential
 - Potential of torching and spotting
 - No large fire history or low fire occurrence

- Values at risk situations
 - High density of structures with lack of defensible space
 - Scattered areas of high density homes less than one mile apart
- Infrastructure situations
 - Access, water availability and fire fighting capability is absent or minimal
 - Access, water availability and fire fighting capability is limited but present
 - Access, water availability and fire fighting capability is adequate and maintained

Using the criteria and “communities at risk” identified in the Federal Register, the US Forest Service (USFS) created a regional WUI map for use at broad levels of analysis and planning as shown in Figure 5-7 (USDA Forest Service, Northern Region, Fire Aviation and Air & Engineering, 2004).

In evaluating the WUI layer developed by the USFS, it was quickly determined that a more detailed map was needed for local planning and project level use. For this reason, a new County-wide WUI map was developed as part of this CWPP.

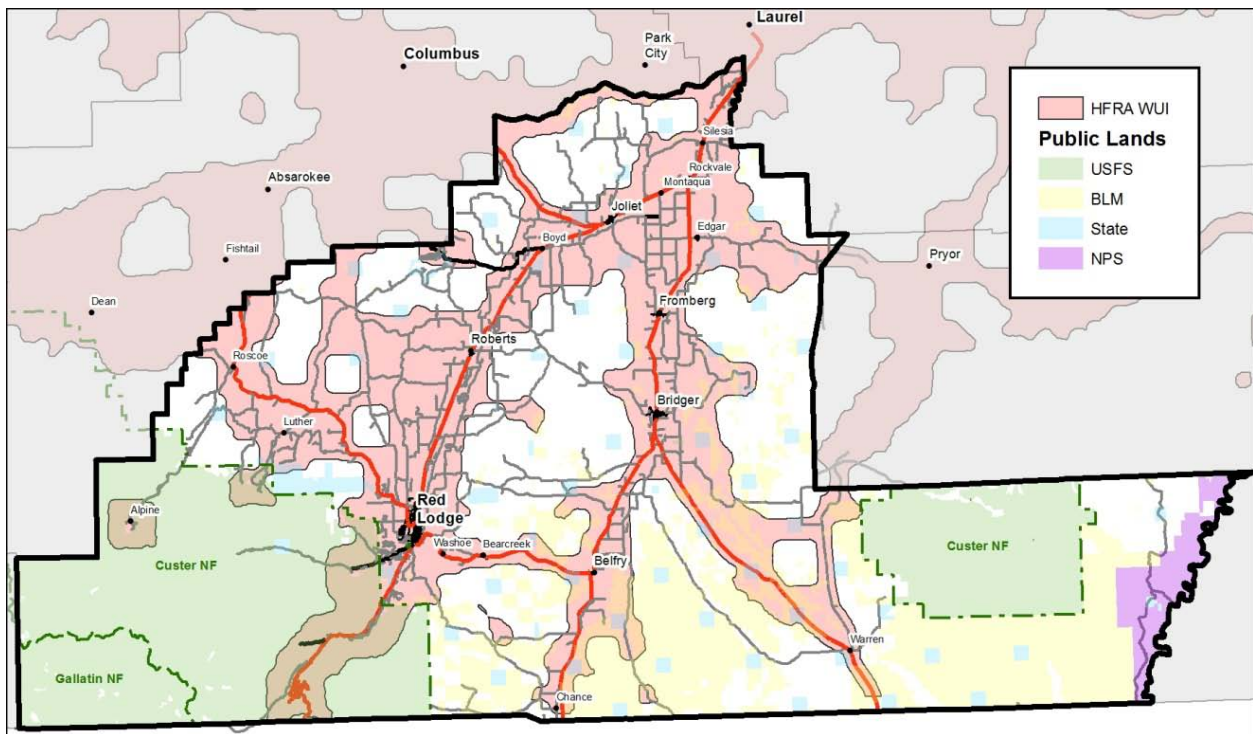


Figure 5-7. Map of Carbon County map showing a modeled version of the Healthy Forest Restoration Act (HFRA) WUI

5.5.3 Methodology

At the time of this writing, no accepted or standardized methodology was in place for mapping the WUI at the County level. For this reason, the County, with assistance from Red Lodge Fire Rescue, developed a simple, yet defensible method for mapping the WUI outside the National

Forest. The methodology was used to map the WUI and combined with an existing WUI layer developed by the Custer National Forest to produce a county-wide WUI map.

Custer National Forest Approach to Mapping WUI

The Custer National Forest (CNF) developed a WUI map for the forest in 2011. This approach focused mostly on human occupancy within the Forest and egress along major transportation corridors. To capture these areas within the WUI, the CNF applied a 1.5 mile buffer on the interior of the Forest boundary in combination with a 0.75 mile buffer around major roads entering the Forest (Stockwell, 2012). The resulting WUI designation can be seen in Figure 5-8.

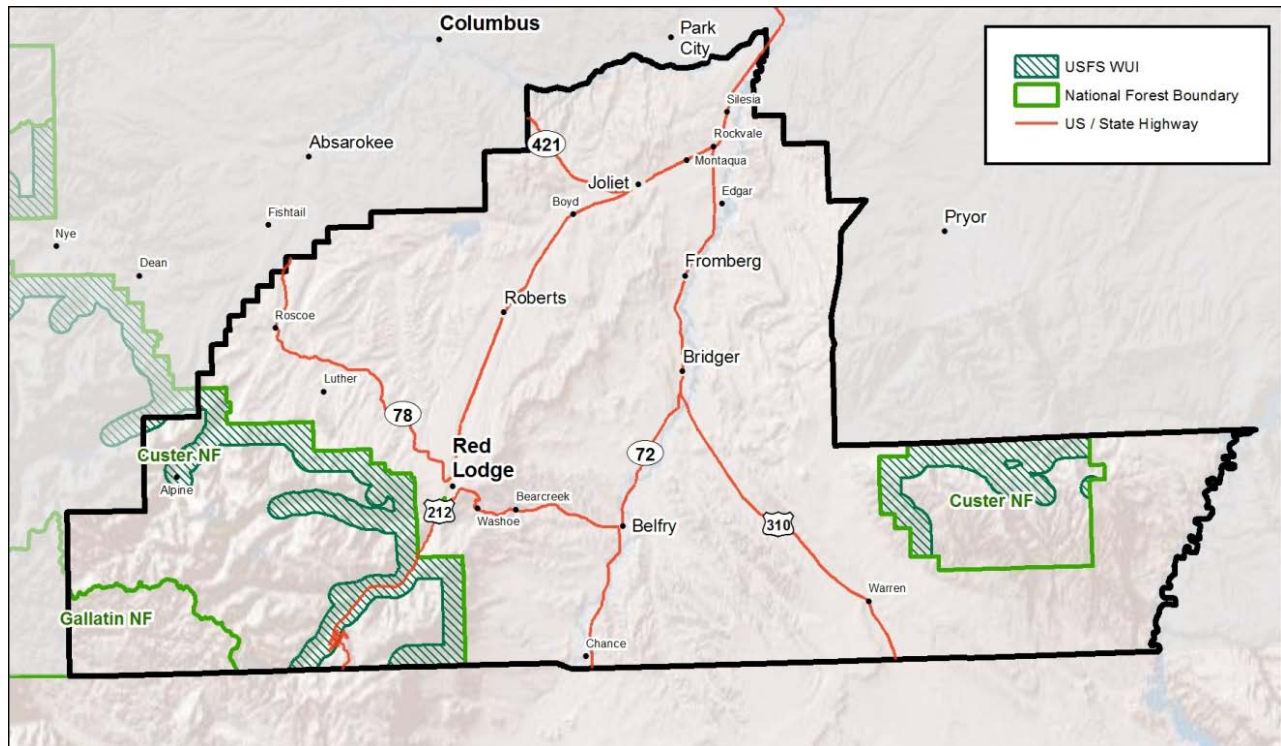


Figure 5-8. Map of Carbon County showing US Forest Service Designated WUI.

County Approach to Mapping WUI

The County approach examined moderate to heavy wildland fuels, potential for fire brands and proximity to existing structures. The specific steps in the process are outlined below.

Step 1 - Identify and map concentrated fuels. Research conducted by **Jack Cohen** and others have shown that fire is transferred to structures through two primary avenues: direct impingement (conduction) and through fire brands. When delineating the WUI for the County, these two concerns were addressed.

Direct impingement occurs when fires in heavier fuels are located close to structures. A GIS layer of Anderson fuel types (Anderson, 1982) was used to identify heavy fuels types in the County. The following four Anderson fuel types were extracted from the GIS and used when mapping wildland fuels:

Timber (litter and understory) – Type 10

The fires burn in the surface and ground fuels with greater fire intensity than the other timber litter models. Dead-down fuels include greater quantities of 3-inch (7.6-cm) or larger limbwood resulting from over maturity or natural events that create a large load of dead material on the forest floor. Crowning out, spotting, and torching of individual trees are more frequent in this fuel situation, leading to potential fire control difficulties.



Any forest type may be considered if heavy down material is present; examples are insect- or disease-ridden stands, windthrown stands, overmature situations with deadfall, and aged light thinning or partial-cut slash.

Hardwood litter – Type 9

Fires run through the surface litter faster than model 8 and have longer flame height. Both long-needle conifer stands and hardwood stands, especially the oak-hickory types, are typical. Fall fires in hardwoods are predictable, but high winds will actually cause higher rates of spread than predicted because of spotting caused by rolling and blowing eaves. Closed stands of long-needled pine like ponderosa, Jeffrey, and red pines, or southern pine plantations are grouped in this model. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning.



Closed timber litter – Type 8

Slow-burning ground fires with low flame lengths are generally the case, although the fire may encounter an occasional “jackpot” or heavy fuel concentration that can flare up. Only under severe weather conditions involving high temperatures, low humidities, and high winds do the fuels pose fire hazards. Closed canopy stands of short-needle conifers or hardwoods that have leafed out support fire in the compact litter layer. This layer is mainly needles, leaves, and occasionally twigs because little undergrowth is present in the stand. Representative conifer types are white pine, and lodgepole pine, spruce, fir, and larch.



Timber (grass and understory) – Type 2

Fire spread is primarily through the fine herbaceous fuels, either curing or dead. These are surface fires where the herbaceous material, in addition to litter and dead/down stemwood from the open shrub or timber overstory, contribute to the fire intensity. Open shrub lands and pine stands that cover one-third to two-thirds of the area may generally fit this model; such stands may include clumps of fuels that generate higher intensities and that may produce firebrands. Some pinyon-juniper may be in this model.



Because the Anderson fuel types were originally mapped using satellite-based, Thematic Mapper imagery and formatted as a raster GIS layer, the conversion to vector-based polygons was necessary to group distinct concentrations of these fuels and project fire brands (see Step 2). Polygons were digitized using a “heads-up”, on-screen approach, in combination with ancillary GIS layers and local field knowledge. Ancillary GIS layers included LandFire Fuel loading model (USDI - US Geologic Survey, 2008), Gap Analysis land cover and 2011 National Agriculture Imagery Program (NAIP).

Step 2. Identify and map fire brand zones. Several sources recommend a 1.5 mile buffer from the fuel load which is an estimate of how far an average fire brand can travel through air (108th Congress of the United States of America, 2003) (California Fire Alliance, 2001) (Stewart, 2007). While fuels within the “fire brand” area may be limited, it only takes one well placed fire brand to ignite a structure. Heavier fuels necessitated the full 1.5 mile buffer while less dense or scattered fuels required less of a fire brand distance (Table 5-3).

Table 5-3. Fire brand buffer distances for the Anderson fuel types used in the Carbon County WUI map.

Anderson Fuel Type	Buffer Distance
Timber (litter and understory), Closed timber litter, Hardwood litter	1.5 Miles
Timber (grass and understory) where fuel was correctly classified as Ponderosa Pine/grass or Juniper woodland/grass	1.0 Miles
Timber (grass and understory) where fuel was incorrectly classified as Timber/grass. Ancillary sources and local knowledge confirmed these areas as dense sagebrush steppe.	0.5 Miles

Figure 5-9 shows the four Anderson fuel types, the digitized fuel boundaries and the variable buffers around these boundaries based on the buffer distances defined in Table 5-3.

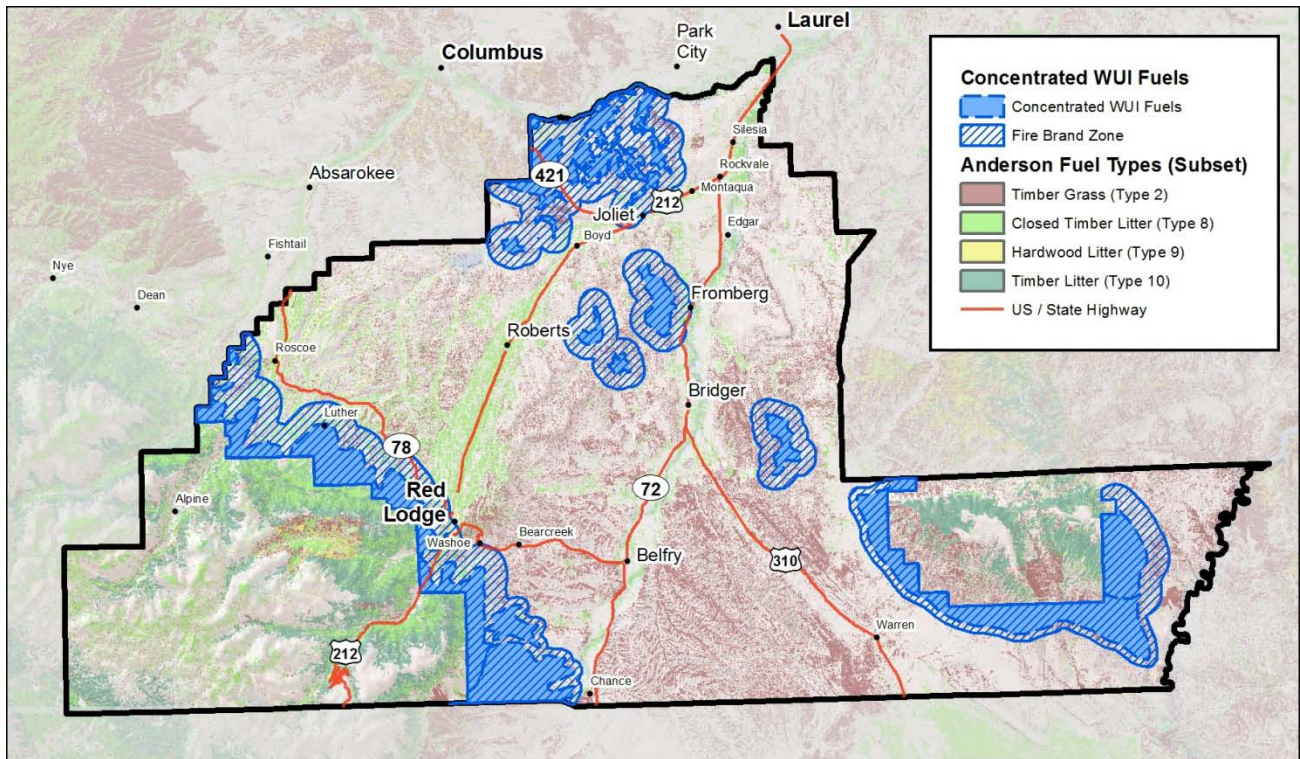


Figure 5-9. Map of Carbon County showing a subset of Anderson fuel types, digitized boundaries of concentrated fuels and fire-brand buffers.

Step 3 - Identify and map human development concentrations. As defined in the Montana annotated code, the WUI is the “line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.”

Given this definition, the next step in the creation of the WUI map was to identify concentrations of human development in the County. Addressed structures were previously mapped by the County (Carbon County Disaster Emergency Services (DES), 2012) and was used as the base layer for this analysis. Specifically, the GIS created a structure density map based on a 0.5 mile radius for every location in the County. The result was a map that could be classified into three categories of human development: 1-5 structures/sqmi., 5-25 structures/sqmi. and >25 structures/sqmi. Figure 5-10 shows the density of structures throughout the County using these categories.

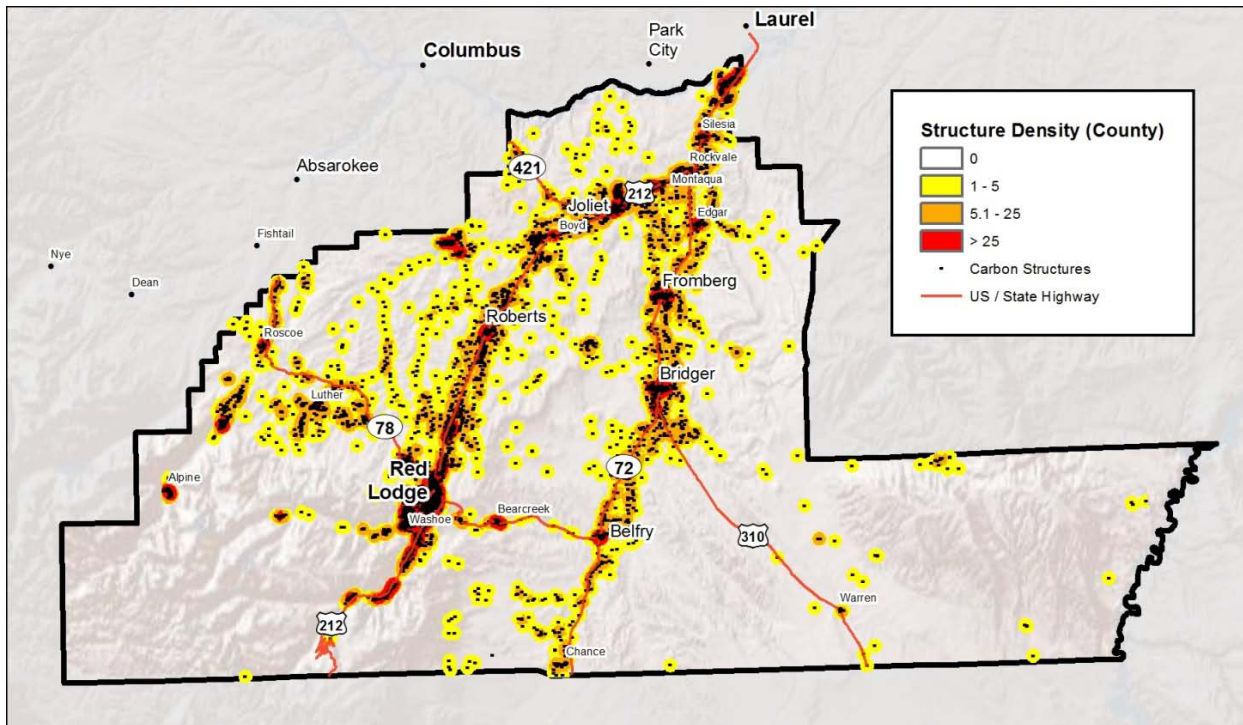


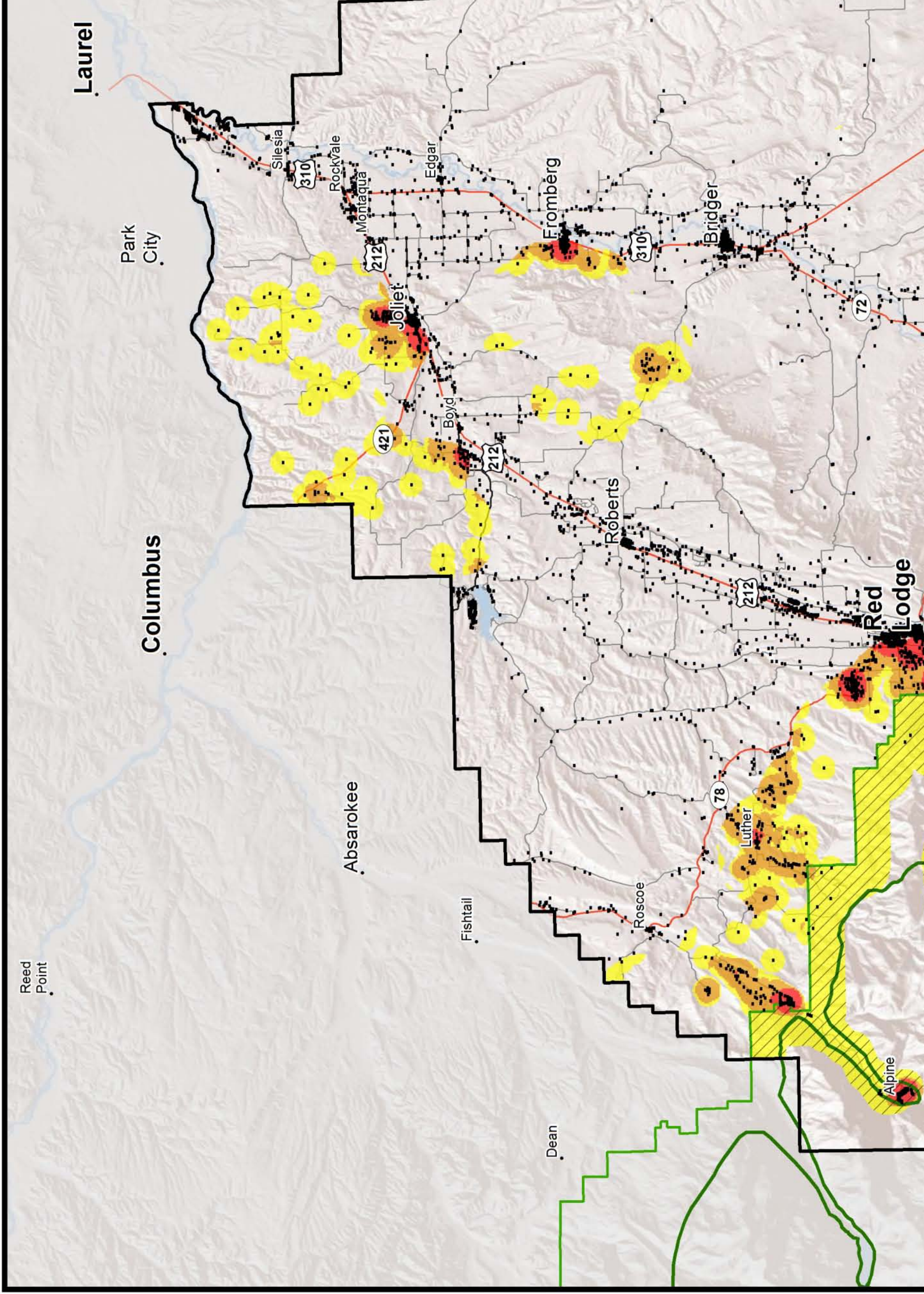
Figure 5-10. Map of Carbon County showing structure density.

Step 4 - Combine County and USFS WUI models. The final County WUI map, Figure 5-11, was developed by combining the wildland fuels map (with fire brand buffers), the structure density map and the existing WUI map developed by the US Forest Service. WUI categories of High, Medium and Low portrayed on the map represent the same categories used for structure density; 1-5 structures/sqmi. (Low), 5-25 structures/sqmi. (Medium) and >25 structures/sqmi. (High).

This methodology resulted in only 268 square miles (13%) of the County being classified as WUI. However, 2,552 structures (37%) were located in the WUI. Sixty-six residential subdivisions are completely within or intersect the WUI (Table 5-4).

Table 5-4. Residential subdivisions within the Wildland Urban Interface.

400 Ranch	Grand View North	Mountainbrook	Rocky Fork Acres
Aspen Hollow	Grand View South	Nordic Estates	Rolling Hills
Aspen Ridge Ranch	Grill	North Twenty Estates	Rosebud Ranch
Beartooth Business Park	Grizzly Peak	Owen	Salo Homesites
Beartooth Mountain Estates	Harnish Meadows	Palisades Basin Ranches	Sandhill Springs
Beartrap Estates	Kane	Palisades Properties	Sheep Mountain
Berg N Dahl	Lamb Estates	Point of Rocks	Spires
Black Butte Ranch	Lazy D Ranch	Ponderosa Estates	Sun Ridge
Canyon Ranches	Lazy SL Ranches	Raymond	Sundance
Canyon View	Little Willow Creek Prop.	Remington Ranch	Tipi Village
Cedar Creek	Meadowood	Remington Ranch West	Wadsworth Cabin Sites
Cottonwood Coulee	Meeteetse Meadows	Rimrock View	Wapiti
Creek Hill	Mountain Meadows	RLCCE	Waples
Creekside Estates	Mountain Shadow	RnR Elk Resort	Waples/Red Lodge Estates
Eagle Point	Mountain View	Rock Creek Estates	West Fork Estates
Gramling Orchard	Mountain Waters	Rock Creek Mine	Wilderness Estates



In addition to these subdivisions there are five of summer home areas, three recreational camps, and one research facility located within the forest boundary, permitted by the US Forest Service.

The summer home areas in the West Fork drainage include 21 cabins in Camp Senia, 3 cabins in Dutch Creek and 4 other scattered cabins in the West Fork drainage. The permitted summer home areas in the Main Canyon include Spring Creek with 22 cabins, Corral Creek with 9 cabins, Sheep and Snow Creek with 30 cabins.

Recreational camps include the Timbercrest Girl Scout Camp, Westminster Spires Camp and the Lions Beartooth Mountain Youth Camp. Timbercrest is located in the West Fork drainage, with an estimated 34 structures, mostly small cabins. The camp is located in the lower Dutch Creek drainage along West Fork Road. Westminster Spires Camp is located in the Main Fork and has 13 structures. The Lions Camp is located near the confluence of the Lake/Main Fork of Rock Creek and has approximately 22 structures.

The Yellowstone Bighorn Research Association (YBRA) camp is situated high up on the east slope of the Main Canyon of Rock Creek approximately five miles south of Red Lodge. The camp has a large number of wooden structures, is located in the timber, and is difficult to access. The camp is occupied around the clock during the fire season with staff and students. One steep dead-end road serves the camp. The staff is active in practicing fire prevention and response and has some water for fire protection stored on site. Fuels reduction around the YBRA facility was completed in 2011 by Red Lodge Fire Rescue with funding from the BLM.

Recreation Staff Officer for the Beartooth District, Jeff Gildehaus, estimates that approximately 30% of these structures have wooden shake roofs. The remaining 70% have roofs of either metal or composition shingle. The structures themselves are all built of wood. Some also have stone features such as chimneys. In all but a few cases, defensible space has not been created around these structures.

In addition to the summer homes and the homes located within subdivisions, there are a number of individual homes located in the Main Canyon and near the base of the West Fork of Rock Creek. In the Main Canyon most of the homes are situated either along the creek bottom or on the first terrace above the creek.



Figure 5-12. Picture of Home situated in the bottom of the West Fork of Rock Creek drainage.

Several homes in the Main Canyon, however, are located on the steep side slopes of the canyon. Access is difficult due to road grades and fuels are a mixture of grass and scattered pine. Upslope from these homes are heavier fuels and even steeper terrain with no vehicle access. There are no water sources at these homes for fire protection other than the domestic wells which in some cases yield very small amounts of water.

Other subdivisions located just outside of the WUI, but still having wildland fire concerns is Sam's Retreat and Mountain View subdivisions on the north side of Cooney Reservoir. Combined, these subdivisions have 62 homes/cabins/trailers present. Access to the subdivisions is limited by steep, narrow roads and flashy fuels surround the subdivisions.

5.6. Assessment of Risk

5.6.1 Ignition Profile

Nine ignition sources for wildland fire were identified by the members of the Carbon County Fire Council on October 21, 2004. These sources include: lightning; highways and roads; railroads; power lines; equipment and industrial activity, recreational activity, rural residents, escaped controlled burns, and other sources. Fire Council members mapped common ignition sources and locations based upon their experience during the Fire Council meeting held on January 20, 2005. Map locations were identified based upon the criteria of four or more starts at or near the location over a 10-year period.

In general, relatively higher numbers of lightning starts occurred in the Pryor Mountains and the higher mountainous country south and west of Red Lodge. Human-caused ignitions occurred along roadways and near rural residences. Power line ignitions occurred where the lines were exposed to high winds, for instance between Red Lodge and Belfry. Railroad

ignitions occurred along the tracks in the northern and eastern portions of the county. The fire chiefs in the north, central, and eastern areas of the county reported that they respond to a significant number of escaped fires from land owners burning ditches, borrow pits, and farmland stubble. According to law enforcement, the majority of fire starts on public lands in the county are human rather than lightning caused. And although most of the past human caused fires have been accidental, this may not always be the case in the future. It is possible that the percent of arson ignitions in the future may grow.

Risks of accidental human-caused ignition are highest along roads and highways, power lines, railroad tracks, and around developed recreation sites.

Risks of human-caused ignition are moderate in areas of dispersed recreation and rural residences. Risks of ignition to wild lands are lowest within the developed community areas, on agricultural lands, and in the river valley bottoms. Risk of ignition

from lightning is highest at the topographical high points,

including the Beartooth Plateau and mountain front, the Pryor Range, and on Shane Ridge in the northwest area of the county.



Figure 5-13. Picture of agricultural burning north of Silesia, March 2005

5.6.2 Behavior and Development Trends

Behavior and development issues related to fire protection vary across the county. Growth and development are occurring in the north end of the county, along the Rock Creek valley, in the Red Lodge area, and along the mountain front. The challenges presented by development differ depending on the fuel types, terrain, access, and response times.

Generally, the development of most concern in the county from the standpoint of fire protection is occurring south and west of Red Lodge along the wildland urban interface area against the boundary of the National Forest. Previously subdivided lots continue to be built upon and new subdivisions continue to be proposed at a steady rate, creating up to as many as several hundred new lots per year. Although the number of new developments fluctuates somewhat from year to year, nothing indicates this trend will change in the near term and it may even become more pronounced as the baby boom demographic continues to look for retirement property in areas with access to recreational opportunities, wildlife, and scenery. Even without additional subdivision, a large number of lots are already available to be built upon.

New rural residences are typically wood frame construction or in the interface areas, log construction. Many of the subdivisions' covenants require rustic construction materials that fit

in visually with the natural landscape. Fortunately, most new homes in interface areas are being constructed with metal or composition shingle, rather wooden shake roofs.



Figure 5-14. Picture of typical new construction in wildland area - log with metal roof.

“There are a significant number of second home owners in the areas around Red Lodge. These less-than-fulltime residents are less interested in protecting their properties than fulltime residents. This can put adjacent properties at increased risk” (Kuntz, 2004). In the Roscoe

area “people are choosing to build in

the interface area. This makes fire protection more complicated because access is difficult and fuels are heavy” (Noe, 2004). In the Roberts area, “people are building in more areas without direct highway access, in more rural areas” (Joki, 2004) This can lengthen response times and present access challenges.

The good news if there is any is that when a fire does occur, property owners respond. “When a fire happens in someone’s “backyard” there is generally a flurry of activity related to creating defensible space. Examples of this were homeowners’ activities in the 400 Ranch and Main Canyon of Rock Creek following the Willie Fire in 2000” (Stockwell, 2012). After the Cow Creek Fire in the north end of the county, a number of individuals replaced their wood shake roofs with metal roofs (Hoferer, 2004). Unfortunately actions to manage fuels are all too often relatively short-lived and property owners do less well at managing the fuel situation over the longer term than they do immediately following an incident.

Property owners in the Tipi Village subdivision west of Red Lodge are replacing roofs as well. Many of the homes in the subdivision are approximately 25 years old. As the original shake roofs reach the end of their useful life, materials chosen for replacement have been exclusively metal and composition shingle. This trend may be related to the proximity of the Willie Fire in 2000 since residents of the Tipi Village Subdivision were evacuated during that fire.

One disturbing trend based upon the experience of reviewing many proposed major subdivisions and their subsequent development was noted by Chief Kuntz. There is a trend not to build out subdivisions in the way they were approved. There are no checks to ensure the development occurs as per the requirements of the county in their approval. There is no enforceable code for such things as maintenance of roads and fire protection systems. In some cases, the problems associated with lack of proper construction and maintenance of

roads and fire protection systems may not become evident until the call comes in and responders are forced to do their best in a less than desirable situation. Losses could exceed those that would have occurred had the systems and roads been constructed to standard and properly maintained. In the worst case, firefighters' and residents' lives could be put at additional risk (Kuntz, 2004).

Highway 310 which passes through the Clarks Fork Valley carries a large amount of semi-truck traffic. The volume appears to be increasing and there are semis hauling a great deal of potentially hazardous material through the county (Maddox, 2004). This can increase the potential of a hazardous material spill and/or ignition of a wildland fire along the highway.

Although not a trend in human behavior or development, the trend in climatic conditions in recent years has major implications for wildland fire severity. Carbon County has been experiencing a severe, long-lasting drought. The USDA has declared the county a drought disaster for the past several years. Many areas of the county, particularly the south and southeastern portions, receive only small amounts of precipitation even in average years. Lower levels of precipitation affect fuel moisture as well. Mortality due to the stress of continued drought is occurring in a number of timbered areas of the county.

Some, but not all of the departments in the county are challenged to maintain an adequate volunteer staff. Serving as a volunteer on a department requires a time commitment not only to respond to calls, but also to maintain currency in training. The departments have had differing experiences in utilizing individuals under the age of 21, some have been satisfactory and some unsatisfactory. The departments in the county have different policies on lower age limits as a result of their experiences. Many people in the county work more than one job, or work at jobs such as agriculture that have high demands on their time during certain seasons. Time spent with the fire department may be time away from family. In some areas of the county, Red Lodge for example, the economics have produced a demographic with a relatively small number of young families, a pool from which volunteers could logically come. In other areas of the county, the population is more aged and unable to serve.

5.7. Unique Wildfire Severity Factors

Increased probability of ignitions in the county occurs as a result of both natural and person-caused situations. Natural ignitions have and continue to occur due to topographical features such as ridges, high elevation plateaus, and high points.

Many areas of the county are at risk from unintended person-caused ignitions. The situation is slightly different between the eastern and western halves of the county. The public lands in the Pryor Mountains experience grazing management and recreation activity year-round, much of the activity being associated with the use of motorized vehicles. Along the Clarks Fork Valley bottom, the railroad is responsible for numerous grass fires during the spring, summer, and fall. Travelers on Highway 310 are also responsible for fire starts both from vehicle accidents and discarding burning debris. Many landowners in the Clarks Fork and lower Rock

Creek valleys burn off stubble and grasses in their fields and ditches in the spring. These landowner actions often result in escaped fires to which the departments must respond.

In the western half of the county, Highway 212 follows the Rock Creek drainage. Travelers on the highway start fires as a result of vehicle accidents and the discard of burning materials. The public lands south and west of Red Lodge receive heavy recreational use during the driest times of the year. Some of these uses include hiking, camping, wildlife viewing, hunting and fishing, fire wood collection, and recreational vehicle operation. Vehicles can start fires along county and forest roads, and each year numbers of campfires are left unattended, some serving as ignition sources. In addition, there are 27 recreational residences in the West Fork drainage, and 69 recreational residences in the Main Canyon of Rock Creek that are permitted by the Custer National Forest within the forest boundary. These cabins are used primarily during the summer months when fire danger is highest. Three organizational camps are permitted within the forest boundary, Timbercrest in the West Fork, and Westminster Spires and the Lion's Camp in the Main Canyon of Rock Creek south of Red Lodge. The YBRA Camp is also located in the Main Canyon and is used during the fire season.

Extreme fire behavior can occur in the county due to:

- 1) prolonged drought conditions causing low fuel moisture, stressed vegetation, and mortality in some timbered areas such as Shane Ridge, the West Fork of Rock Creek, and the Main Canyon of Rock Creek,
- 2) high winds, and resulting blow down,
- 3) heavy, mature fuels, especially in the West Fork and Main Canyons of Rock Creek,
- 4) Terrain breaks in the center and northern parts of the county, and steep terrain and canyons in the Pryor and Beartooth Mountains.

5.7.1 Blowdown and Insects

In mid-November 2007, severely high winds resulted in extensive blowdown throughout lodgepole pine and mixed-species forest stands on the Beartooth Ranger District. Disease and insect specialists from the USFS inspected several windthrown stands on the district in May 2008. Their findings revealed that "the greatest threat of bark beetle outbreaks appear to be from Douglas-fir and spruce beetles. While most of the downed trees appear to be lodgepole pine, and some of it may be infested by engraver beetles, I believe the likelihood of an engraver beetle "outbreak" is not great." They also found that "threats of mountain pine beetles infesting downed lodgepole pine is slight. Only rarely do mountain pine beetles attack downed trees. The possibility of engraver beetles building to outbreak populations in ponderosa pine, while not non-existent, does not appear to be extreme" (Greg DeNitto, 2008).

5.8. Values to be Protected

5.8.1 Assessment of Economic Values

Agriculture in Carbon County consists of both farming and ranching. Ranching assets at risk from wildfire include livestock (cattle, sheep, and horses), forage, and range improvements. The USDA collects farm statistics every five years. The most recent year for which these statistics are available for Carbon County is 2007. According to the USDA National Agricultural Statistics Service, there were 56,859 cattle and calves, 6,011 sheep and lambs, 3,191 horses and ponies, and 49 bison in Carbon County in 2007

Farm assets that could be at risk include crops, storage facilities such as grain and bean elevators, equipment and machinery. Because much of the cropland in the county is irrigated, especially in the Clarks Fork Valley, risk of loss from wildland fire to farms is limited. The “important farmland” as designated by the U.S. Department of Agriculture follows the bottom of the Clarks Fork Valley and corresponds to areas of low risk for wildland fire because of vegetation and terrain factors (US Department of Agriculture, 1976).

Commodities produced in the county are primarily the result of agricultural activity. In addition to agriculture, however, a small amount of commercial forest products such as post and poles, and firewood are harvested. There are no lumber mills in the county. Oil and gas is produced and stored in the Elk Basin Field in the southeastern portion of the county. Wildland fire in the area of oil production has the potential to interrupt production for short periods of time.

Critical community infrastructure was identified by the plan steering committee. The values for the critical infrastructure are provided in Appendix C of the PDM plan. With the exception of the West Fork of Rock which serves to meet a portion of the municipal water needs for the city of Red Lodge, other critical community infrastructure is not at risk from wildland fire.

Tourism is an important sector in the economy of Carbon County. Both residents and visitors enjoy outdoor activities year-round in the county. Tourism occurs primarily in the summer season when Highway 212 between Red Lodge and Yellowstone Park is open, and during the winter months when Red Lodge Mountain is open for ski traffic. Summer tourist activities in the county include wildlife viewing, angling, hiking, cycling, floating, rock climbing, and horseback riding. In the fall, bear, big game, and bird hunting bring people to the county. And in winter, downhill and cross-country skiing occur in the Red Lodge area.

5.8.2 Assessment of Ecological Values

As a result of the ranges in elevation, aspect, temperature, precipitation, vegetation, and terrain in the county, Carbon County provides diverse wildlife habitat. The county is home to a variety of big game species such as white-tailed and mule deer, elk, moose, big horn sheep, antelope, and mountain goats. Other featured species include black bears and mountain lions. In addition, numerous small mammals, fur-bearers, game birds, and migratory and non-migratory songbirds reside in the county. Grizzly bears and grey wolves, both listed under the

Endangered Species Act can be found in the southwestern areas of the county in the mountains.

Air quality in the county is generally excellent due to natural dispersal and lack of polluting activity. Short-duration impacts to air quality include smoke from wildland fire in the summer and fall, smoke from ditch burning in the spring, dust from travel on unpaved roads, and dust from agricultural practices primarily in the spring. Yellowstone National Park located to the south and west of the county has been designated a Class One airshed.

Soils in the county consist of five major associations. According to the Carbon County General Resource Assessment (NRCS, 1999) the most common soil types were formed in the sedimentary uplands and occur throughout the central part of the county from the Yellowstone River to the Wyoming line and in the southeast corner of the county. The other soil associations include deep, well-drained soils in mixed alluvium; well-drained sand and gravel soils along the Clarks Fork floodplain, mixed alluvium and glacial outwash soils along the mountain front, and limestone bedrock in the Pryor Mountains and foothills. Soils in the Clarks Fork Valley are highly productive for agricultural purposes.

According to the County's Growth Policy (Carbon County Montana, 2001), just over 390,000 acres of the county are covered by forests. Most of this acreage, 368,000 acres is in evergreen forest, deciduous species cover only 9,000 acres, and mixed forest, covers the remaining 16,000 acres.

5.8.3 Assessment of Social Values

The majority of lands located in Carbon County are undeveloped (Carbon County Montana, 2001). Development covers only 1200 acres of the county. Approximately 55% of the population resides outside of the five incorporated communities. Most of these residences are found either along the valley bottoms or along the mountain front in the western portion of the county. As with many other areas in Montana and the west, people have chosen to settle in areas immediately adjacent to wildlands for reasons of solitude, aesthetics, and nearness to nature and wildlife.

Individuals who live in and visit Carbon County do so for a number of reasons. These include having grown up in the county or having family here, productive agricultural lands, outdoor recreation opportunities, wildlife viewing opportunities, desiring a scenic view, desiring a healthful environment, wanting to live in an area with a low crime rate, and/or finding land and property more affordable than in other locations.

To some extent the reasons for residing in the county vary by area of the county. The residents in the north end of the county are frequently commuters to jobs in Billings, many in the Clarks Fork Valley are longer-term residents engaged in agriculture, and those along the mountain front tend to be more recent residents concerned with wildlife, aesthetic values, and tourism. Many home owners along the mountain front in and to the west of Red Lodge are second home owners and seasonal residents who leave the county during the winter months.

5.8.4 Potential Loss Estimate

The 2005 CWPP for Carbon County included a catastrophic wildland fire scenario for the purpose of estimating potential losses. The loss estimate was developed with input from the Forest Service and included a wind-driven fire in the lodgepole stands in the West Fork of Rock Creek. The scenario burned 15,000 acres on both the National Forest and adjacent private lands. Twenty seven cabins, 40 residences on private lands and the Timbercrest Scout Camp were lost in the scenario. Direct costs for this fire scenario were estimated at \$44 million with several million more in indirect costs (e.g., loss of recreation users and resulting loss of commerce for area businesses; loss of commercial opportunity for firewood and post and pole products). Indirect costs related to negative impacts to the municipal water watershed, fisheries and habitat were also considered.

Ironically, the Cascade fire of 2008 mimicked this scenario in terms of location and size of the fire (Figure 5-15), but not in terms of the number of structures lost. The fire originated near Camp Senia and burned up the drainage about two miles and down to Basin Campground. The burn area total was 10,173 acres. Two cabins at Senia were lost and several recreational amenities were lost or damaged by the fire. \$11.4 million was spent to suppress the fire (Stockwell, 2012). Again, this figure only included direct suppression cost and did not include expenses related to rehabilitation or any indirect costs associated with the fire.

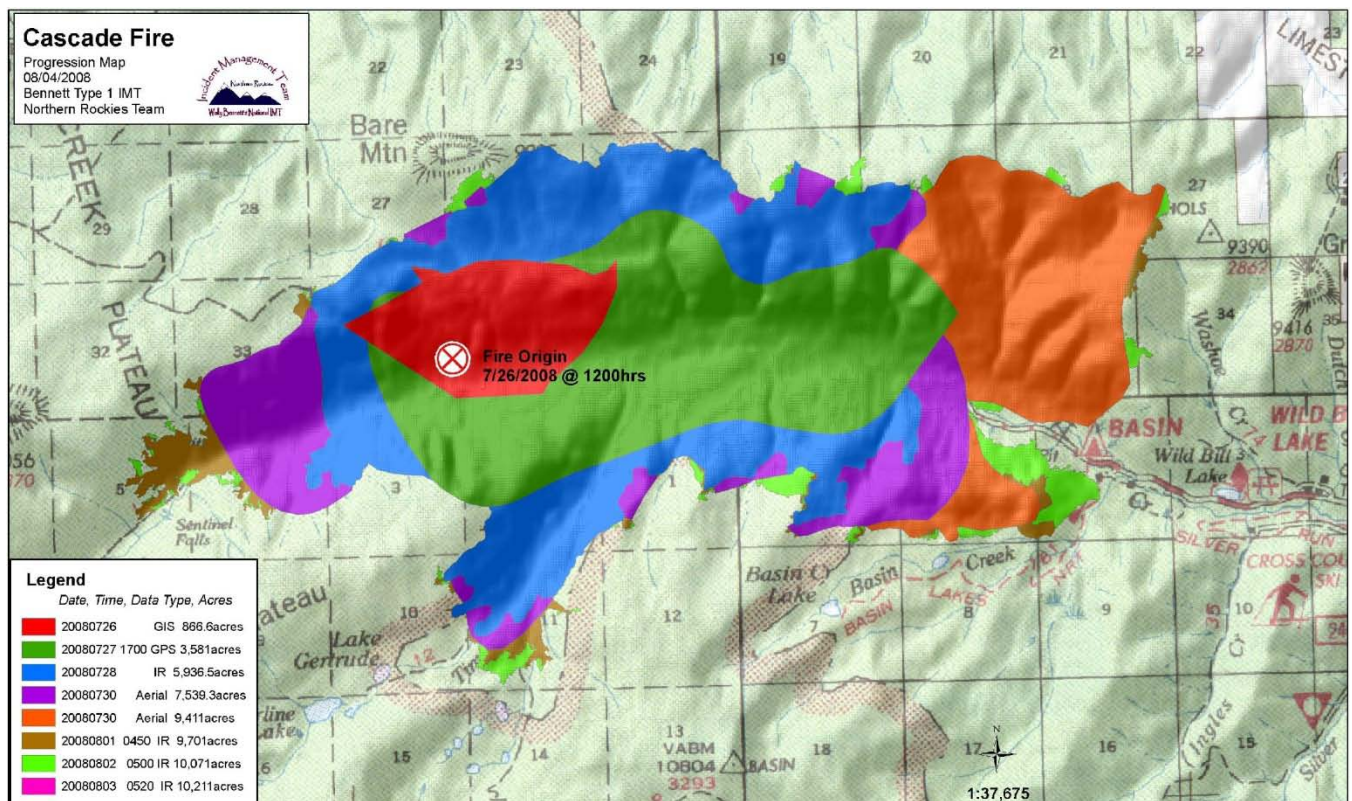


Figure 5-15. Fire progression map of the 2008 Cascade Fire in the West Fork Drainage near Red Lodge.

5.9. Assessment of Fire Protection Preparedness and Capability

Each Department Chief and Fire Management Officer was asked to assess their departments with respect to ability to respond to grass and timber fires (Table 5-5). Most of the departments in the county are able to respond competently and safely to both types of wildland fires meaning they have had training and experience in suppressing these wildland fires.

Maintaining adequate numbers of volunteers was an issue for several, but not all of the departments. Some departments are short-staffed during work-day hours when volunteers are working at out-of-area jobs and unavailable.

Insurance premiums are based on a rating system established by the Insurance Services Office (ISO.) The ISO considers the water system and fire protection capability of a community when issuing a rating. The rating system contains ten protection classifications. Class One is the best rating a community can receive, Class Ten is the lowest, meaning the ISO recognizes little if any ability to provide fire protection. The ratings in Carbon County range from 5 in Bridger, Roberts, and Red Lodge, to 10 in other locations. Rural areas are less well protected than communities.

5.9.1 Community Preparedness

Table 5-5. Fire protection response capability of Rural Fire Districts in Carbon County.

Department	Number of Volunteers	Structural ISO Rating	Ability to Respond to Grass Fires *	Ability to respond to Timber Fires *
Joliet RFD 1	20	9	4	4
Bridger RFD 2	25	4 or 5	1	3
Fromberg RFD 3	10	9	2	2
Edgar RFD 4	12	9	1	2
Absarokee RFD 5	19	6 City 10 Rural	4	4
Roberts RFD 6	11	7 Town 8b Rural (>5 mi)	1	4
Red Lodge RFD 7	40	5 City 8 Rural (<5 mi) 9 Rural (>5 mi)	1	3
Laurel RFD	42	7 Rural (<5 mil) 10 Rural (>5 mi)	1	5
Belfry RFD 9	13	6	1	4-5

* Ratings for ability to respond to grass and timber fires were based upon a scale of 1-10 with 1 being very able to respond, and 10 being unable.

Carbon County has been successful in obtaining grant funds in past years and continues to pursue them as they are available. Rural Fire Assistance (RFA) and Volunteer Fire Assistance (VFA) grants have been the primary funding sources.

The RFA Program is a Department of the Interior program to enhance firefighter safety and strengthen fire protection capabilities. Funding requests are limited to training, equipment, and prevention activities. A maximum allowable contribution from the Department of the Interior

per Rural Fire Department per year is established at \$20,000. The Rural Fire Department has the capability to meet cost-share at a minimum of 10%, which may include in-kind services.

VFA, Title IV, is a federal matching funds program with dollars provided through the USDA Forest Service. The program is administered by the DNRC. RFA/VFA grants in the following amounts were obtained by the county (Table 5-6).

Table 5-6. RFA/VFA grant money distributed to Carbon County 1975-2010.

Year	Grant Award
1975-2000	\$ 33,729.93
2001	\$ 23,102.48
2002	\$ 28,177.14
2003	\$ 20,273.00
2004	\$ 30,000.00
2005	\$ 20,000.00
2006	\$ 22,000.00
2007	\$ 6,960.00
2008	\$ 17,950.00
2009	\$ 24,000.00
2010	\$ 20,000.00
TOTAL	\$ 246,192.55

5.9.2 Fire Apparatus Stationed in the County

In addition to the local departments which include DNRC apparatus, there are apparatus maintained by the Bureau of Land Management stationed at Billings, and apparatus maintained by the Custer National Forest stationed in Red Lodge.

Table 5-7. Rural fire district inventory of fire apparatus.

DEPARTMENT	APPARATUS TYPE	NAME	YEAR	MAKE	MODEL	AXIL	WATER (Gal)	PUMP (GPM)	PUMP (PSI)	CAFS?
Absarokee	Type 1 Engine	Engine F9-1					750	1500		
Absarokee	Type 1 Engine	Engine F9-2					750	1200		
Absarokee	Type 1 Support Water Tender	Tender F9-4					2000	300		
Absarokee	Type 3 Engine	Engine F9-5					500	300		
Absarokee	Type 6 Engine	Engine F9-6					250			
Absarokee	Type 6 Engine	Engine F9-7					300			
Absarokee	Type 1 Support Water Tender	Tender F9-8					2500	350		
Absarokee	Type 6 Engine	DNRC 1666					250			
Absarokee	Type 6 Engine	DNRC 1897					500			
Bear Creek	Type 1 Engine	Engine 1					500	1250		
Bear Creek	Type 6 Engine	DSL 217				4x4	250	125		
Belfry	Type 2 Engine	Engine 92	1987	E-One			750	1250	200	
Belfry	Type 1 Tactical Water Tender	Tender 91	1988	Kenworth	T600		3000	500	180	
Belfry	Type 3 Engine	Wildland Engine 91	1999	Ford	F550	4x4	500	160	100	
Belfry	Type 3 Engine	Wildland Engine 93	1984	International		4x4	900	350	160	
BLM	Type 6 Engine	Engine 1061				4x4	400			Yes
BLM	Type 6 Engine	Engine 1062				4x4	300			
Bridger	Type 2 Tactical Water Tender	Engine 23	1994	International	466 Auto		1000	1200		
Bridger	N/A	Rescue 21	1999	Ford	F450	4x4	N/A	N/A	N/A	
Bridger	Type 4 Engine	Engine ___	1971	GMC		6x6	750	31		
Bridger	Type 6 Engine	Engine ___	1980	Chevy		4x4	250	350		
Bridger	Type 6 Engine	Wildland Engine 22	1983	Ford	F250	4x4	260		550	
Bridger	Type 6 Engine	Wildland Engine 23	2007	Ford	F450	4x4	300			
Bridger	Type 3 Engine	Wildland Engine 26	1997	Ford	F350	4x4	250		175	
Bridger	Type 1 Support Water Tender	Tender 27	2005	Kenworth	T800		4200	500		
Bridger	Type 1 Support Water Tender	Tender ___	1987	Freightliner			4000			
Bridger	Type 1 Engine	Engine 24	1987	Ford	L-8000		1200	1200		
Edgar	Type 1 Engine	Engine 41	1970	International	2010		500	1000		
Edgar	Type 6 Engine	Wildland Engine 42	2005	Ford	F450	4x4	300	250		
Edgar	Type 6 Engine	Wildland Engine 43	1986	Ford		4x4	250	250		

Edgar	Type 4 Engine	Wildland Engine 44	1995	Freightliner	70	4x4	750	250	
Edgar	Type 4 Engine	Wildland Engine 45	1995	International	4900	4x4	750	250	
Edgar	Type 6 Engine	Wildland Engine 47	2009	Ford		4x4	500	?	
Edgar	Type 2 Support Water Tender	Tender 41	2005	International			3200		
Fromberg	Type 2 Support Water Tender	Tender 30					4000	200	
Fromberg	Type 2 Engine	Engine 32					500	1000	
Fromberg	Type 2 Engine	Engine 31					500	500	
Fromberg	Type 3 Engine	Wildland Engine 33	1973	Dodge	600	4x2	800	200	
Fromberg	Type 6 Engine	Wildland Engine 34	1989			4x4	200	125	
Fromberg	Type 6 Engine	Wildland Engine 35	1994			4x4	200	125	
Fromberg	Type 6 Engine	Wildland Engine 36	1974	Dodge		4x4	200	200	
Fromberg	N/A	QRU							
Fromberg	N/A	Light Truck							
Joliet	Type 1 Engine	Engine 11	1985				1000	1250	250
Joliet	Type 1 Engine	Engine 12					750	1500	250
Joliet	Type 1 Engine	Engine 14					3000	1250	250
Joliet	Type 6 Engine	Wildland Engine 15				4x4	500	250	Yes
Joliet	Type 6 Engine	Wildland Engine 16				6x6	1100	125	
Joliet	Type 6 Engine	Wildland Engine 17				4x4	500	250	
Joliet	Type 3 Support Water Tender	Tender 11					1400	250	
Joliet	Type 3 Support Water Tender	Tender 12					1200	250	
Joliet	Type 3 Support Water Tender	Tender 14					1500	1000	
Joliet	N/A	Command 11				4x4	N/A	N/A	
Joliet	N/A	Command 12				4x2	N/A	N/A	
Joliet	Type 6 Engine	DSL 1760					400	125	
Joliet	Type 6 Engine	DSL 1803					200	250	
Laurel	Type 1 Engine								
Laurel	Type 2 Support Water Tender								
Laurel	Type 2 Support Water Tender								
Laurel	Type 4 Engine								
Laurel	Type 5 Engine								
Laurel	Type 6 Engine								
Laurel	Type 6 Engine								
Red Lodge	Type 1 Engine	Engine 71	2004	Pierce			1000	1250	Yes
Red Lodge	Type 1 Engine	Engine 73	1991	Pierce			500	1250	
Red Lodge	Type 5 Engine	Engine 72	2000	Ford		4x4	500	250	Yes
Red Lodge	Type 2 Engine	Engine 74	1986	GMC			700	1000	

5.10. Mitigation Goals, Objectives, Projects and Priority Rankings

The following goals, objectives, and projects were originally developed and ranked by the Carbon County Fire Council in 2005 and reviewed/revise in 2012. The projects have been ranked as High, Medium, or Low. They were first ranked subjectively by the Chair of the Fire Council based upon values and lives at risk, how broadly they applied across the county, and the duration of affect. The projects were then reviewed, updated, and concurred with by the Fire Council members at their April 19, 2012 meeting in Bridger. Projects will be pursued dependent upon staff and dollar resources available.

Table 5-8. Fire mitigation goals and objectives for Carbon County

Goal 1. Protect the public from loss of life and injury due to wildland fire				
Objective	Status	Projects	Rank	Lead
Objective 1. Raise awareness about fire danger				
Raise awareness of fire danger through an advertising campaign including a series of articles, mailings, and billboards	In Progress	Highway 212 Billboard; Fire Danger Sandwich boards; VFRA grant	Medium	DNRC, RFD
Better communicate with the local media about Red Flag warnings	In Progress	Weekly meetings of "Billings Area Restriction Group" during fire season	High	DNRC, DES
Develop maps of the wildland urban interface areas with safety zones and escape routes	Not Started		Medium	DES
Objective 2. Ensure residents are prepared to evacuate	Status	Projects		Lead
Develop or purchase evacuation pamphlets and distribute to rural residents	Not Started	USFS has developed and distributed public handout; "Ready, Set, Go" pamphlets should be evaluated	Low	USFS, CCSO
Develop evacuation kits to accelerate evacuation process	In Progress	completed for at-risk subdivisions	High	CCSO
Develop detailed WUI boundaries to identify at risk developments	Completed	CWPP	Medium	RFD, DES
Goal 2. Protect firefighters from loss of life and injury due to wildland fire				
Objective	Status	Projects	Rank	Lead
Objective 1. Ensure firefighters are adequately equipped and supported				
Work with commercial providers to improve cellular communications in the Clarks Fork Valley	In Progress	Bridger south to State line and Rockvate/Silesa areas need better coverage	High	DES
Pursue grants for PPE and communications equipment upgrades	In Progress	Have received several grants to purchase PPE	Medium	RFD, DES
Objective 2. Monitor and address specific risk factors	Status	Projects		Lead
Monitor drought/insect/disease stress and mortality in timbered areas.	In Progress	USFS Blowdown report MFO-TR-08-03 for Beartooth District	Medium	USFS
Conduct training sessions on response to hazmat carried by the railroad / Pipelines	In Progress	Training sessions held at RFD by railroad and pipeline companies	Low	RFD, DES
Work with the State of Montana and the Custer National Forest to develop a safe area in the West Fork drainage	Completed	Fuel reduction projects; evacuation plan and Cascade fire	High	DNRC, USFS
Demolish the grain elevator at Edgar	Completed	Demolished	Low	

Objective 3. Learn from each incident how to better protect fire fighters	Status	Projects	Lead
Conduct after action review for all major incidents or at least one annually by the Fire Council.	In Progress	Major incidents often reviewed at Fire Council Meetings; AAR with USFS after Cascade Fire	RFD, USFS, DNRC
Goal 3. Maximize protection of property from wildland fire in communities			
Objective 1. Ensure adequate response capability to protect existing assets	Status	Projects	Lead
Continue to pursue grant opportunities for equipment and training	In Progress	Rural Fire Assistance grant for PPE and communications equipment	RFD, DES
Objective 2. Maintain adequate water supply infrastructure	Status	Projects	Lead
Inventory/assess water supply infrastructure (e.g., hydrants, pumps, backup generators)	In Progress	Annual fire hydrant checks	RFD
Goal 4. Maximize protection of property from wildland fire in rural areas			
Objective 1. Provide technical expertise and staff resources to reduce fire danger in WUI areas	Status	Projects	Lead
Pursue WUI fuel reduction projects in high risk areas around the county	In Progress	Greater Red Lodge Area (GRLA) Vegetation Management Project implemented by USFS; Carbon County Cooperative project implemented by BLM	USFS, BLM, RFD
Jointly develop a fuels reduction project for the Beartooth Face (Grove Creek Areas) area south of Belfry	In Progress	Low priority	USFS, BLM, RFD
Continue work to implement to assist the 400 Ranch in fuel reduction	Completed		
Continue Forest Service project to offer fuels reduction around recreation residences in the Main Canyon and the West Fork of Rock Creek	In Progress	YBRA fuel reduction	USFS, RFD
Prepare an evacuation plan for each interface subdivision/area	In Progress	Developed for W Fork Drainage (Cascade Fire) and Cooney Dam area	CCSO
Attend a board meeting of the YBRA, the Girl Scouts, the Westminster Spires, and the Lion's Camp at the beginning of each summer to discuss fire prevention, fire protection, and evacuation plans	In Progress	USFS meets with groups annually/semi-annually as needed	USFS

Meet with Klammerts Tie Yard to discuss fire prevention and encourage development of a prevention and response plan	Completed		Low		RFD
Objective 2. Emphasize personal responsibility for protection of property	Status	Projects		Lead	
Host a Firewise workshop for rural subdivisions in the Red Lodge area.	Completed		Medium		
Target rural property owners and second home owners by including a fire prevention message with property tax notices.	Not Started		Medium	County	
Assist Red Lodge Mountain in replacing wood roofs with non-combustible on four base area buildings, creating defensible space on the south side of the Administration building, and thinning to protect the Palisades quad lift	Not Started		Medium	USFS, RFD	
Conduct home ignition hazard assessments in WUI areas	In Progress	Most of WUI areas near Red Lodge complete	Medium	RFD	
Meet with individual property owners in USFS recreation areas to discuss fire protection	In Progress	Beartooth Ranger District Pursuing this	Low	USFS	
Objective 3. Eliminate major known hazards	Status	Projects		Lead	
Bury 12 miles of electrical lines in the West Fork of Rock Creek drainage	Not Started		Medium	USFS	
Objective 4. Enhance effectiveness of response	Status	Projects		Lead	
Create a map of the county showing water sources for fire fighting	Not Started		High	RFD, DES	
Determine locations for additional water supplies and pursue funding to develop new water sources available for fire protection	Not Started		High	RFD, DES	
Identify those areas of the county with constructed assets at risk and no physical access. Meet with property owners or subdivision associations to pursue remedies. (e.g. Bridges at Western Ranch Estates, WRE II and Shane Ridge Rd.)	Not Started		Medium	RFD	
Goal 5. Ensure new developments are designed for adequate fire protection					
Objective 1. Provide high quality technical review and input on all proposed development in the county	Status	Projects		Lead	
Have county attorney provide a training session for chiefs on providing input to subdivision review process	Not Started		High	County	
Objective 2. Guarantee subdivisions are constructed as approved	Status	Projects		Lead	

Ensure that subdivisions are built as approved and fire protection systems are initially and periodically certified	Not Started			High	County, RFD
Objective 3. Educate locals who advise new residents and developers. Develop and provide a workshop that would qualify for continuing education credits for architects, engineers, and realtors on defensible space and fire wise principles Develop and provide a workshop on defensible space and Firewise principles for the county planning staff and planning board	Status Not Started Not Started	Projects		Medium Medium	Lead County, RFD RFD
Goal 6. Ensure an effective, coordinated response to wildland fire incidents that covers the entire county					
Objective 1. Assist residents in areas currently not covered who are willing to meet legal requirements to obtain fire protection coverage Explore inclusion of 'No Fire Protection' area southeast of Bridger into District	Status In Progress	Projects Initial investigation underway		Medium	Lead County
Objective 2. Utilize available technology to assist in response Implement the E-911 system Review new technologies to improve response/communications	Status Completed In Progress	Projects Emergency Notification System (ENS) grant		Medium	Lead DES, CCSO
Objective 3. Ensure cooperative agreements in place meet current needs Develop new or update existing MOU's as needed	Status In Progress	Projects Existing MOUs/Mutual Aid Agreements are current		Medium	Lead County, USFS, RFD
Objective 4. Maintain adequate numbers of qualified volunteers Develop and/or purchase volunteer firefighter recruitment materials Work with the Carbon County News to feature one volunteer firefighter in the newspaper each month	Status In Progress Not Started	Projects RFD7 grant for recruitment/retention staff		High	Lead RFD RFD
Objective 5. Document response activities to support grant requests Report all responses to the state as requested Set up "call-out" data base in cooperation with dispatch center to document the number of responses	Status In Progress Not Started	Projects NFIRS		Medium Medium	Lead RFD, DES RFD, DES

Goal 7. Recognize fire as a natural process in ecosystem maintenance on lands where appropriate				
Objective 1. Determine those areas where return to natural regimes is desirable. Complete mapping of condition class for the county.	Status	Projects		Lead
Develop desired condition maps, identifying condition class	In Progress	USFS has maps that show current condition; difficult to show desired conditions; not being pursued	Medium	USFS
Develop goals and projects to return those areas determined desirable to their natural fire regime and manage other lands appropriately	In Progress	Current/past fuels projects working toward this goal	Medium	USFS
Identify criteria for fire use allowing natural ignitions to continue burning within parameters	In Progress	AB Wilderness burn plan allows natural ignitions to burn; Non-wilderness allow fire to play natural role to meet mngt. Objectives	Medium	USFS

RFD = Rural Fire Districts; CCSO = Carbon County Sheriff's Office; DES = Disaster and Emergency Services; DNRC = Department of Natural Resources and Conservation; BLM = Bureau of Land Management; USFS = US Forest Service

5.11. Implementation

5.11.1 Roles and Responsibilities

The goals in this Community Wildfire Protection Plan will be realized through implementation of the projects. The plan contains a variety of types of projects. Due to the variety, many individuals and agencies will play a role in project implementation.

Individual property owners will be responsible for educating themselves and taking appropriate action to create defensible space around their structures, both residential and commercial. Subdivision associations will have the opportunity to work with their local fire departments, state, and federal agencies to select specific fuel treatment alternatives.

Not-for-profit organizations such as the Yellowstone Bighorn Research Association, the Girl Scouts, and other various special use camp permit holders will be responsible for coordination with professionals in the agencies to obtain technical expertise and education, and to do fuel reduction treatments within their capabilities.

For-profit businesses may be involved in sharing expertise, as in the case of the Burlington Northern Santa Fe on hazardous materials. Or, they may be involved in infrastructure evaluation and upgrades, such as the cellular phone companies in the Clarks Fork Valley. The Carbon County News may be asked to run features about firefighters to assist in recruiting efforts. Beartooth Electric may look to partner with funding agencies to accomplish the project to bury overhead lines in the West Fork drainage. Private business may also obtain contracts for work identified in this plan to reduce fuel or other hazards.

County responsibilities fall in the area of education on existing regulations and investigation of additional regulatory needs. The county may also assist in bringing together parties for cooperative projects.

The Department of Natural Resources and Conservation (DNRC) will continue to provide assistance to local fire departments in the form of grants, technical expertise, and resources when wildland fires exceed local capacity.

The Bureau of Land Management (BLM) and Forest Service will both provide technical assistance, project funds, suppression assistance, educational materials, and training. The BLM may schedule and carry out fuels reduction project in cooperation with neighboring land owners including other agencies and private individuals as funding allows.

The Natural Resources Conservation Service may be asked to assist in monitoring the acreage enrolled in the Conservation Reserve Program as a way to better understand the fuel hazard.

The Federal Emergency Management Agency (FEMA) may provide grant funds to accomplish projects and may be involved in post-disaster assistance in the event of a catastrophic fire.

5.11.2 **Schedule**

No firm schedule has been established for accomplishing the listed projects. Accomplishment of projects depends on the availability of resources and funding. Many of the projects can proceed through the efforts of an individual or individual agency or organization, such as the Forest Service fuel reduction program in the Main Fork of Rock Creek. Not all of the projects will require specific funding, for example, the County Attorney will likely be able to set up a training course for the county fire chiefs on subdivision regulations with no additional resources.

Other projects, for example the fuel reduction along the Beartooth Face, or creating defensible space around recreation residences will require bringing many parties to the table and the alignment of priorities and funding from several sources. These projects will proceed as the circumstances allow.

As required by the National Fire Plan, federal agencies are to align their funding and staff resources with the priorities expressed in this community wildfire protection plan. As a result, accomplishment of many of the projects will depend on the funding and staffing of the BLM and Forest Service. Additionally, the amount of VFA/RFA funds available to the local fire departments will have an effect on the ability of those departments to participate in the planning and execution of projects on the ground.

By jointly identifying the projects and their priorities with city, county, state, and federal partners, it is hoped that project planning and execution will be well coordinated and occur first on the highest priority projects.

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