Blaine County
Community Wildfire Preparedness Plan

FINAL

September 2005

Bear Paw Development Corporation
of Northern Montana

MAXIM TECHNOLOGIES
ENGINEERING & ENVIRONMENTAL CONSULTANTS

FINAL

BLAINE COUNTY MONTANA
COMMUNITY WILDFIRE PROTECTION PLAN

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LIST OF ACRONYMNS

ATGS	Air Tactical Group Supervisor
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe
COE	U.S. Army Corps of Engineers
CWPP	Community Wildfire Protection Plan
CRP	Conservation Reserve Program
DES	Montana Disaster and Emergency Services
DOI	U.S. Department of Interior
DMA	Disaster Mitigation Act
DNRC	Department of Natural Resources and Conservation
EOC	Emergency Operations Center
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FD	Fire Department
GIS	Geographic Information Systems
GPM	Gallons Per Minute
GPS	Global Positioning Systems
HFRA	Healthy Forests Restoration Act
IC	Incident Commander
ICS	Incident Command System
MPH	Miles per hour
MIST	Minimum Impact Suppression Tactics
NED	National Elevation Dataset

NFP	National Fire Plan
NIFC	National Interagency Fire Center
NIMS	National Incident Management System
NLCD	National Land Cover Dataset
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resource Conservation Service
NWCG	National Wildfire Coordinating Group
NWS	National Weather Service
PDM	Pre-Disaster Mitigation Plan
RAWS	Remote Automated Weather Stations
USFWS	U.S. Fish and Wildlife Service
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
VFA	Volunteer Fire Assistance Fund
VFD	Volunteer Fire Department
WUI	Wildland Urban Interfac

1.0 EXECUTIVE SUMMARY

1.1 INTRODUCTION

Wildfires directly impact the safety and well being of Blaine County residents, the county's assets and surrounding natural resources. The purpose of the Blaine County Community Wildfire Protection Plan (CWPP) is to provide Blaine County residents, public and private organizations with assistance and recommendations to mitigate wildfire risk and vulnerability presented by wildfires within the county. Blaine County, working in conjunction with Montana Disaster and Emergency Services (DES), National Weather Services (NWS) U.S. Bureau of Land Management (BLM), U.S. Forest Service (USFS), Montana Department of Natural Resources and Conservation (DNRC), and Maxim Technologies (Maxim), prepared this document (the Plan) to help guide and focus wildfire hazard mitigation activities. The Blaine County CWPP profiles significant wildfire related hazards to the community and identifies preparation activities that can reduce their impacts. The purpose of the Plan is to promote sound public policy designed to protect citizens, both private and public assets of the county and the natural resources of the county from natural and human caused wildfire hazards. The Blaine County CWPP includes resources and information to assist county residents, organizations, local government, and others interested in participating in planning for the occurrence of natural and man-made wildfire hazards. The protection plan provides a prioritized list of wildfire prevention and preparedness steps that will assist Blaine County in reducing risk and preventing loss from future wildfire events.

1.2 AUTHORITY

The Blaine County CWPP is a county level planning document which will add to Montana's state wide fire plan as administered at the state level by the USFS and the BLM. Montana's overall plan, adequately underpinned and approved by these agencies at the county level, would then contribute to the U.S. National Fire Plan. The Blaine County CWPP also complements and enhances the Counties Pre-Disaster Mitigation (PDM) Plan which amends the Robert T. Stafford Disaster relief and emergency assistance act by adding a new section, 322 – Mitigation Planning. It requires all local governments to have an approved Pre-Disaster Mitigation Plan in place to be eligible to receive Hazard Mitigation Grant Program project funding. The CWPP for Blaine County also affords the county with compliance to the Healthy Forests Restoration Act (HFRA) of 2003. This Act put in place statutory incentives for the USFS and the BLM to assist communities on the county level to develop and implement forest management and hazardous fuel reduction programs.

Blaine County and the incorporated towns of Harlem and Chinook have adopted this CWPP as an appendix to the Blain County Pre-Disaster Mitigation Plan. These governing bodies have the authority to promote sound public policy regarding natural and man-made wildfire hazard mitigation. Copies of the signed Resolutions from these jurisdictions are included as *Appendix A* of this plan. The Plan was adopted at the regularly scheduled meetings of the Chinook and Harlem city councils and at the meeting of the Blaine County commissioners, all of which were open to the public and advertised through the communities' typical process for publicizing public meetings.

The Blaine County DES Coordinator will be responsible for acceptance and submission of the adopted Plan to the DNRC National Fire Plan Coordinators Office in Missoula, Montana for review and incorporation into the state wide plan. This state level review will address the State of Montana criteria outlined in *Appendix C – Wildland / Urban Fire Assessment and Mitigation Planning*. The National Fire Plan Coordinator will compile the various county level plans in preparation for revision to the State plan which will then be compiled on the National level for inclusion into the National Fire Plan. Upon

approval, Blaine County and the other Plan signatories will retain eligibility for local wildfire mitigation project grants and forest management and hazardous fuel reduction programs.

1.3 ACKNOWLEDGEMENTS

Many groups and individuals have contributed to development of the Blaine County CWPP. City and county level fire officials, National Weather Services (NWS) U.S. Fish and Wildlife Service (USFWS), the BLM, the DNRC and the local DES Coordinator provided significant guidance and support to all aspects of plan development. Numerous elected officials, city and county personnel, and the local communities participated in the planning process and contributed significantly to the Plan's development.

1.4 PLAN OVERVIEW

The community and officials of Blaine County are committed to the preservation of the safety of residences and protection of natural resources and community assets with the management area. The Blaine County CWPP has been prepared to better prepare community wildfire response resources, prioritize hazardous fuels reduction needs and ultimately protect the community from the potentially devastating and costly effects of wildfires.

To this end, this Plan has been prepared with input from a variety of resources including stakeholders representing a range of interests in the community. The plan has been prepared with the following structure:

- Section 1: Executive Summary; a brief synopsis of the plan (current section)
- Section 2: County Profile; addressing the regional management area in location, climate and weather, and economy
- Section 3: Scope and Plan Organization; itemizing the planning process to date, and public comment considerations
- Section 4: Hazard Evaluation and Risk Assessment; outlining county fuel loads/types, weather, topography, wildland/urban interface, historical fire events and overall risk of fire
- Section 5: Assessing Vulnerability; identifying assets and vulnerable populations to include an assessment of economic, ecological and social values
- Section 6: Mitigation Strategy; examines the existing situation, and prioritizes strategies and outlines steps to accomplish agreed mitigation strategies
- Section 7: Assessment of Fire Plan Protection Preparedness and Capability; a measure of the existing situation for the county wildfire response assets and capacity
- Section 8: Plan Maintenance Procedures; establishes a method for plan maintenance and updates on an annual basis
- Section 9: References

In addition to affording county residence with planned improvements to wildfire prevention and control measures, the completion and annual updates to this plan will ensure Blaine County remains eligible to receive expedited financial aid in the event of catastrophic wildfire. Having an approved CWPP will also continue and enhance the counties eligibility to receive need based grants from a variety of sources including the DNRC, the USFS and the BLM. The plan also directs any newly acquired funds to projects and resources previously prioritized by the Plan.

2.0 COUNTY PROFILE

2.1 PROJECT AREA AND LOCATION

Blaine County is located in north-central Montana, and has a land area of about 2,730,880 acres or 4,267 square miles. Blaine County is bounded by Hill County and Chouteau County on the west, Phillips County on the east, Fergus County on the south and the provinces of Alberta and Saskatchewan, Canada on the North. Chinook is the county seat and incorporated towns include Chinook and Harlem. The Missouri River forms the southern boundary. The Fort Belknap Indian Reservation occupies an area within the southwestern portion of Blaine County. ***Map 2-1*** represents a location map of the plan area.

Elevations in Blaine County range from about 2,300 feet above mean sea level along the Milk River to about 6,000 feet in the Little Rocky Mountains in the extreme southeastern portion. The Bears Paw Mountains make up the southwestern portion of the county. Extending from the east to the west, the Milk River runs through the north-central section (USDA 1986).

The primary land use in Blaine County is agricultural. Approximately 2,338,866 acres are considered to land in farms with 301,560 acres harvested (USDA 2002).

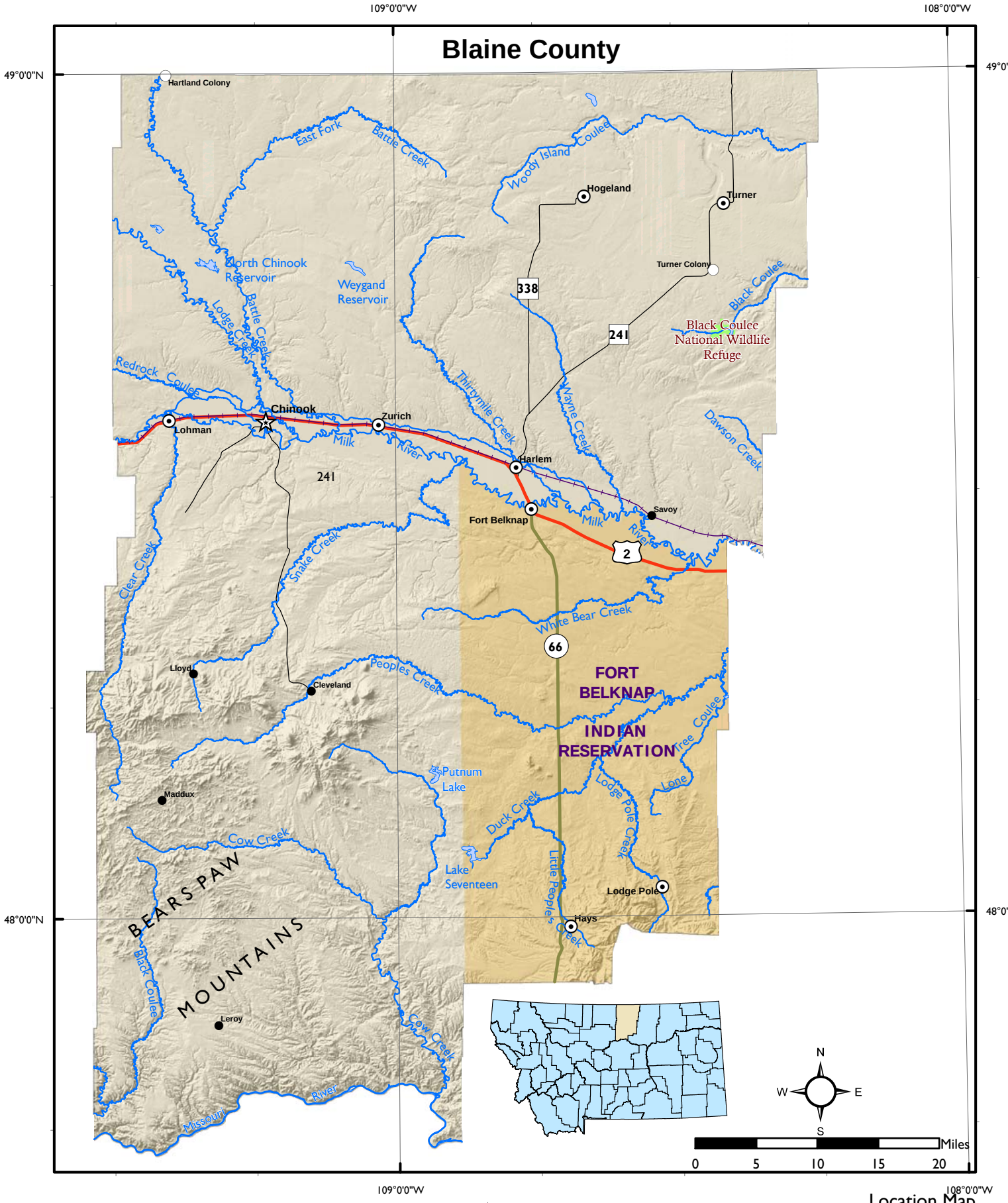
According to the 2000 Census, the population of Blaine County is 7,009. This represents a four percent increase in population in the 10 years since the last census. The median age in Blaine County is 34.4 years old (U.S. Census 2005).

2.2 CLIMATE AND WEATHER

Blaine County, Montana is located within the region generally classified as dry continental or Steppe with four well-defined seasons. The weather can be quite changeable with large day to day temperature variations, particularly from fall to spring. Days with severe winter cold and summer heat are typical.

Average high temperatures in January are 23 to 32° F with average lows 2 below to 10° F above, with the coldest averages over the far northern part of the county and the mildest conditions in the Bears Paw Mountains and far southern part of the county. In winter in particular, temperatures often vary significantly from the averages with significant day to day variations. Temperatures near or below -50° F have been recorded at most locations, while typical extreme winter minimum temperatures are between -25 and -35° F during most years. Often the coldest temperatures occur at sheltered valley locations when winds are light, but extreme wind chill situations occur almost every winter when windy conditions coincide with very low temperatures. Winter Chinooks, or rapid warm-ups with strong west winds, are quite common over the western and southern part of the county. These rapid warm-ups during the winter and early spring can lead to significant snow melt and flooding of small streams and rivers and/or ice jam flood problems.

Average high temperatures in July are in the upper 70s to mid 80°s F with average lows in the 50°s, with the warmest conditions along the Milk River valley and coolest conditions in the Bears Paw Mountains. Brief spells with temperatures above 100° F can occur but are often short lived. Temperatures above 105° F have been reported on rare occasion. Extended periods with temperatures above 90° F occur every few years. Freezing temperatures can occur during mid summer, but are rare except in the Bears Paw Mountains where below freezing lows occur almost every summer.



U.S. Highway 2
Montana Highways
Secondary Routes
Railroad
Indian Reservation
National Wildlife Refuge
Rivers and Streams
Waterbodies
County Seat
Town
Colony
Place

Location Map
Blaine County
Northeast Montana
Community Wildfire Preparedness Plan
Map 2-1

Annual average precipitation is 10 to 12 inches, except up to 20 inches in the higher elevations of the Bears Paw Mountains. Over 65 percent of the annual precipitation total falls from May through September. Precipitation can vary significantly from year to year, and location to location within a given year. November through March, are on average quite dry with average monthly precipitation of 0.50 inches or less. The heaviest most intense precipitation often occurs with localized downpours associated with thunderstorms in June through August. Significant flash flooding can result from these downpours with over 4 inches of precipitation reported in a few events. Widespread heavy precipitation events of 1 to 2 inches can occur every few years and is most common from April through June and September through early November.

Average winter snowfall ranges from 20 to 35 inches, except over the highest elevations of the Bears Paw Mountains where the average snowfall is over 80 inches. The heaviest snowstorms often occur from late March through May or mid October to mid November. These storms can produce more than 12 inches of snow and are often made more severe as temperatures are warmer, and therefore the snow is heavier and more difficult to travel through and remove. These storms are often accompanied by high winds resulting in blizzard conditions. In spring these storms can coincide with the calving season resulting in livestock loss. At low elevations, mid winter snowstorms in general produce less than six inches of snow, but heavier amounts to 10 inches or more have occurred on rare occasions. Despite the generally lighter amounts in mid-winter and drier snow, high winds can result in blizzard conditions. Even without falling snow, in the colder conditions of mid winter, high winds can pick up loose snow, resulting in local ground blizzards. On rare occasions storms can produce over two feet of snow in the Bears Paw Mountains.

Severe thunderstorms are common from June into early September. Typically the greatest hazards associated with these thunderstorms are very highs winds and large hail. Damage to structures and crops occur every summer from these storms. Tornadoes have been reported, but are relatively rare.

An important element of the climate in Blaine County is the often windy conditions. Average wind speeds range from 10 to 15 miles per hour (mph), depending on the exposure of the location. The average and peak sustained winds in the Milk River Valley and Missouri River valleys tend to be somewhat less then the winds over the higher more exposed terrain in the northern and west central portions of the county. The highest wind gusts often occur with thunderstorms during the summer, with gusts over 60 mph occurring every year. The highest sustained winds tend to occur in the spring and fall, with sustained winds over 40 mph occurring every year (NWS 2005).

TABLE 2-1 TOP WEATHER EVENTS					
Hottest Days		**Coldest Days**			
102°	08/05/1961	-35°	01/25/1950		
102°	08/06/1948	-35°	01/20/1954		
100°	07/22/1966	-35°	03/08/1951		
100°	07/22/1963	-33°	01/11/1963		
100°	08/04/1961	-33°	03/06/1951		
Wettest Years		**Driest Years**		**Longest Dry Spells**	
22.13"	1953	9.74"	1960	45 days	1964
19.04"	1962				
14.82"	1954				
14.8"	1957				
13.9°	1955				
Notes: Data from National Weather Service					

2.3 REGIONAL ECONOMY

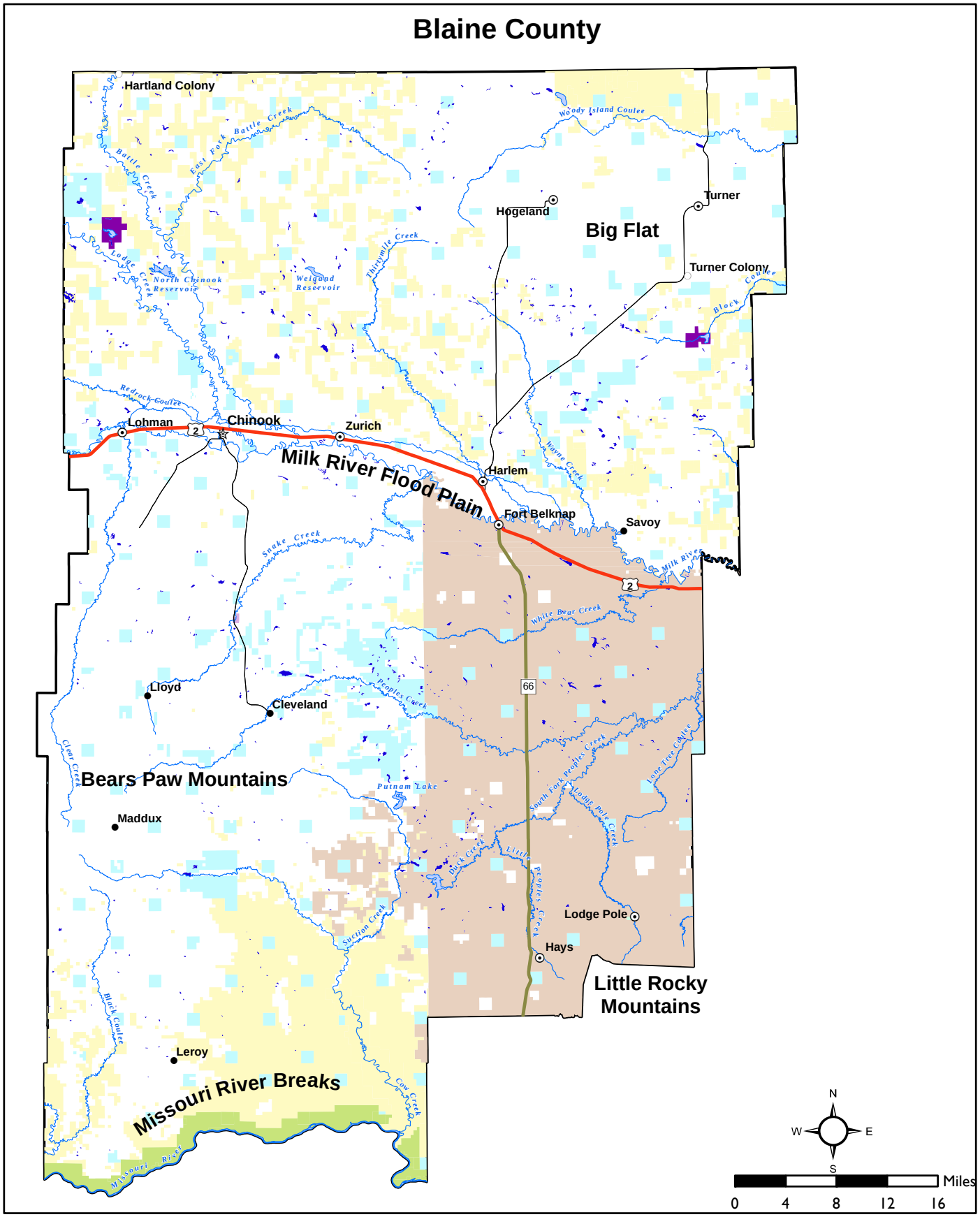
The three major sources of income in Blaine County are government ($31,211,000), agriculture ($4,596,000) and retail trade ($4,317,000) (U.S. Bureau of Economic Analysis, 2002). The average annual unemployment rate in 2004 was 5.6 percent. The unemployment rate for the state was 5.6 percent (Montana Department of Labor and Industry, 2004). The estimated percent of people in poverty in the state was 14.6 percent in 1999 and 28.1 percent in 2000. Blaine County's percent of people in poverty was 28.1 percent in 2000 (U.S. Census).

2.4 LAND TENURE

Land ownership is depicted on ***Map 2-2.*** *Table 2-2* displays amount of acreage per owners in Blaine County. The Bureau of Land Management manages 452,650 acres of public land. Located in the lower portion of Blaine County, the Upper Missouri River Breaks National Monument is managed by the BLM.

TABLE 2-2 BLAINE COUNTY LAND OWNERSHIP	
Owner	**Amount in Acres**
Local Government	142
Native American	498,905
Private	1,557,433
State of Montana	173,904
U.S. Bureau of Land Management	436,263
U.S. Bureau of Reclamation	2
U.S. Fish &Wildlife Service	3,226
U.S. Wild & Scenic	27,798
US National Parks Service	204
water	13,431
Source: BLM Land Status GIS Database	

Blaine County



Private
US BLM
US Wild & Scenic River
US Bureau of Reclamation
US Fish & Wildlife Service
US National Park Service
Native American Lands
State of Montana
Local Government
Water

Land Stewardship
Blaine County
Northeast Montana
Community Wildfire Preparedness Plan
Map 2-2

3.0 SCOPE AND PLAN ORGANIZATION

The scope of the Blaine County Community Wildfire Protection Plan includes the following:

- Identify and prioritize potential wildfire areas that are most probable based on proximity to or use by the general population, Wildland / Urban Interface (WUI) corridors
- Identify critical fire fighting facilities
- Identify areas within the county that are presently the most susceptible to wildfires
- Develop goals for reducing the negative effects of wildfire events
- Develop specific projects to be implemented to accomplish each goal
- Develop procedures for monitoring progress and updating the Plan
- Officially adopt the Plan

The Plan is organized into sections that describe the planning process (Section 3), hazard evaluation and risk assessment (Section 4), assessing vulnerabilities of assets and populations (Section 5), assessing vulnerabilities to potential losses (Section 6), mitigation strategy (Section 7), assessment of fire protection preparedness and capability (Section 8), and Plan maintenance procedures (Section 9). Appendices containing supporting information are included at the end of the Plan.

3.1 PLANNING PROCESS

The Blaine County CWPP is the result of a collaborative effort between Blaine County citizens, public agencies and regional, state, and federal organizations. Public participation played a key role in development of goals and mitigation projects. Interviews were conducted with the Blaine County DES Coordinator, mayors, and elected officials, and three public meetings were held to include the input of Blaine County residents.

3.2 CONTACT LIST

The CWPP planning process was initiated by preparing a contact list of individuals whose input was needed to help develop the CWPP. On the County level, these persons included elected officials (County Commissioners), the DES Coordinator, Sanitarian, Road Department and Health Department. Councilpersons from the incorporated towns were listed (Chinook and Harlem), as well as the mayors, fire chiefs, and other city officials. State agencies included DNRC and Montana Department of Fish Wildlife and Parks (MFWP). Federal Agencies included Ft Belknap Reservation, USFWS and BLM. *Appendix B* presents the Blaine County contact list. Persons and entities on the contact list received a variety of information during the planning process, including project maps and documents for review, meeting notifications, and mitigation strategy documents.

3.3 STAKEHOLDER INTERVIEWS AND MEETINGS

Interviews were conducted with individuals and specialists from organizations interested in hazard mitigation planning. The interviews identified common concerns related to natural and man-made hazards and identified key long- and short-term activities to reduce risk. Stakeholders interviewed for the plan included representatives from local government and fire departments. A list of meetings and interviews with Blaine County stakeholders is presented in *Appendix B*.

3.4 FORMAL PUBLIC MEETINGS

Public meetings were conducted in a tri-county area (Blaine, Hill and Phillips Counties) during initial plan development. The meetings were held in Harlem on January 18, 2005 & January 19, 2005, in Chinook on January 19, 2005, in Havre on January 20, 2005 in Hingham on January 20, 2005, in Malta on February 22, 2005, in Saco on February 22, 2005, in Dodson on February 23, 2005 and in Zortman on February 23, 2005. The purpose of the meetings was to gather information on historic wildfires, update the list of recent historical wildfire occurrences and ignition sources, and gather ideas from citizens about fire protection planning, and priorities for response steps that may aide the communities in reducing the risk of wildfire ignition or the spread of uncontained wildfires. The sign-in sheet from the Blaine County public meeting and meeting summaries are presented in *Appendix B*.

In advance of the public meeting, a press release was distributed to local and regional newspapers including the Great Falls Tribune, Havre Daily News, Phillips County News. Local radio stations who received copies of the press release as public service announcements included KOJM, KPQZ and KRYK. Notices of the public meetings were sent in advance to all jurisdictions participating in the planning process including Chinook, Fort Belknap Agency, Harlem, Hays and Lodge Pole and Blaine County. Notices were sent to all federal, state, and local officials on the project contact list (*Appendix B*). A copy of the press release and media distribution list is included in *Appendix B*. *Appendix B* also contains copies of the press release as it appeared in several local newspapers. Reporters were in attendance at several of the public meetings and follow-up articles on Plan development appeared in local newspapers.

The City Council and County Commission meetings at which the resolutions adopting the plan were passed provided the public with the opportunity to review the final version of the plan.

3.5 OTHER PROJECT MEETINGS

Over the course of the project numerous meetings were held with, and briefings given to, local officials and other stakeholders. At the project's inception the DES Coordinator and the Project Manager for Maxim Technologies toured the project area and met with commissioners from the county and local emergency fire response personnel. The overall project objectives were presented at these meetings and initial concerns and potential mitigation measures were discussed.

3.6 PLAN REVIEW

Review copies of the draft Plan were provided to the DES Coordinator for distribution in hard copy. Plan reviewers included county commissioners, mayors of the various jurisdictions, and other federal, state, and local officials. The DES Coordinator provided review copies of the Plan to all jurisdictions involved in the planning process including Chinook, Harlem, and Blaine County. Public comments were submitted to the DES Coordinator after a 30-day review period. The DES Coordinator reviewed the comments and submitted a consolidated list to Maxim.

A review of the Plan for completeness was conducted after the initial comments were addressed. Plan copies were then submitted to the DNRC and to the attention of the National Fire Plan Coordinator's Office review. The review period lasted 30-days. Upon receipt of Coordinators comments, the Plan was finalized and taken to the County commissioners and jurisdictions for adoption.

Future comments on this Plan should be addressed to:

Blaine County DES Coordinator
Blaine County
P.O. Box 576
Chinook, Montana 59523

4.0 HAZARD EVALUATION AND RISK ASSESSMENT

The hazard evaluation for Blaine County has two primary components. The first component is a qualitative community assessment of the county and larger towns risk to wildfire. The second component is a quantitative assessment using (Geographic Information Systems) GIS based models and the best available data related to fire risk factors including weather, fuel, topography, and fire history.

4.1 COMMUNITY ASSESSMENTS AND MITIGATION ACTIVITIES

The majority of Blaine County residents live in rural areas where equipment and personal are very limited. Fire fighters in remote areas also face limited water supplies and lack of hydrant taps. Fire protection in these rural and interface areas is mostly reliant on landowners and their initiative to create defensible space and other protective measures. Structures in Blaine County are at the greatest risk to wildfire when they are constructed of combustible roofing material, have no defensible space or are located on steep slopes. Proximity to a water supply and fire stations and the availability of equipment and personal are factors in wildfire risk. Properly signed streets are also a risk factor as they allow emergency response crews to quickly and accurately identify routes and decrease response time. Community wildfire hazard and risk assessments were conducted by fire management specialists experienced with wildfire suppression, fire behavior, fuel models, terrain and weather that occur in North Central Montana. Community evaluations were accomplished during on site visits using standard National Fire Protection Association (NFPA) wildfire severity checklists for wildland-urban interface areas. The evaluations are also based on fire behavior fuel models as described in the U.S. Forest Service Document *"Aids to Determining Fuel Models For Estimating Fire Behavior" by H. E. Anderson, 1982*. Utilization of standard wildfire severity rating forms combined with fire behavior fuel models within the county will allow comparisons to risk ratings in all communities surveyed. Written narrative descriptions of each community, fuel models, risk ratings and mitigation suggestions are presented below. The Wildfire Severity Checklists and ratings are included in *Appendix D*.

4.1.1 Incorporated Communities

4.1.1.1.1 Chinook

Chinook is the county seat of Blaine County and is the largest city in the county with a population 1,386. Located on Montana Highway 2 and Montana Highway 240, it is 40 minutes away from Havre. Chinook hosts numerous businesses, a small medical clinic and a small airport. Burlington Northern Santa Fe Railroad (BNSF) runs through the north side of town. Chinook's schools enroll Kindergarten thru 12th grade students. City services include a fire department. Medical services include the Sweet Memorial Medical Center and the Sweet Memorial Nursing Home. County services include library, water and sewage system, law enforcement, fire department, ambulance and emergency services dispatching.

Community Assessment:
The Blaine County fire in 1991 came within two miles of Chinook. The windblown fire had a front several miles wide. A wind shift spared the southwest, southern and southeastern perimeter of town from the fire. Potentially, the fire could have advanced to the perimeter of town and numerous structure losses would have occurred. Once perimeter structures became involved, radiant heat and fire brands could have spread the fire to adjacent structures and into the interior sections of town.

The structures, buildings and homes around the perimeter of Chinook are at moderate risk to wildfire when vegetation cures. When cured fuels are combined with high wind events the risk increases to high.

Structures or homes that have large amounts of flammable vegetation close by and those constructed on steep hills have an increased risk.

Fuels around Chinook include prairie grass, cottonwood stands, and tall cultivated grains, weed species and CRP vegetation. Topography in and around Chinook is gentle to the north with rolling hills to steep coulees and river bluffs to the south and to the west. Rolling plains of grain fields and cattle pasture stretch north to towards the Canadian boarder and to the south of Chinook dryland grain farming stretches south towards the Bear Paw Mountains.

Weather has a heavy influence on containment and control of wildfires in the Chinook area. Winds and low humidity dry fuels quickly allowing ignitions to exhibit high rates of spread with a greater intensity. Wildfire ignition sources in the Chinook area have historically included aircraft crashes, downed power lines, debris burning, lightning, and machinery.

The streets and roads in the Chinook area are named and signed. Property ownership maps are kept and updated by Blaine County.

Structure and wildfire protection for the town of Chinook is provided by the Chinook Fire Department and in part by the Blaine County Fire Department. An adequate water supply for structure fires is provided by a municipal fire hydrant system. Areas outside Chinook are protected by the Blaine County Fire Department. Water availability is a concern for outlying areas. Wildfire protection and suppression is also provided by the Blaine County Fire Department to BLM land north of Peoples Creek.

Mitigation Activities:
Implementation of a defensible space around the town perimeter and outlying structures will reduce ignition potential and the amount of fuels available in the event of a wildfire. Creating a defensible space of 40 feet around structures and homes can be accomplished by maintaining green grasses as long as possible into the fall and keeping grasses cut. Removal or mowing of tall weed patches along fences, property boundaries, irrigation ditches and canals will decrease the spread potential and intensity of any ignitions that occur. Conifer trees that are adjacent to structures should be limbed to at least five feet above ground fuels.

Public awareness of wildfire potential could be accomplished through radio announcements, fire danger signs on roads and highways, and presentation of FIREWISE practices at schools and public meetings.

Implementation and adherence to the Blaine County burning permit requirements is a necessity for wildfire prevention. A Chinook wildfire prevention or awareness day in the late summer would educate residents with updated FIREWISE information and could be combined with fire department displays, demonstrations and fund raisers.

4.1.1.1.2 Harlem

Harlem is a small community located halfway between Havre and Malta (Phillips County) According to the 2000 U.S. Census, the population of the incorporated town of Harlem was 848. Located at the intersection of State Highway 2, Highway 241 and old Highway 396, Harlem is the second largest town in Blaine County. The BNSF railroad line runs through the north side of Harlem and two miles to the south is the Fort Belknap Indian Reservation boundary. Harlem businesses include grocery stores, fuel stations and restaurants. Harlem's schools enroll Kindergarten through 12th grade students. Harlem

provides city law enforcement and has a city Fire Department. Harlem also provides an engine company to the Blaine County Fire Department. A small airport and a senior center are located in the town.

Community Assessment:
In the past 15 years, numerous wildfires have occurred near Harlem. Although none of the fires posed a direct threat to the town, the potential for wildfire destruction remains.

Harlem is rated at moderate risk to wildfires when the vegetation cures. Based on historic fire behavior, rates of spread and ignition potential, the risk increases to high during late summer and fall when the vegetation is cured and dry wind events occur.

Historic wildfire ignitions in the Harlem area have included railroad, downed power lines, debris burning, lightning, fireworks, and cigarettes. Quick response and favorable weather conditions have helped fire departments contain most ignitions within the first initial attack operational period. Wildland fire fuels around Harlem include cottonwood stands, grain fields, short grass prairie, Conservation Resource Program (CRP) vegetation, and weeds species.

The roads, highways and streets in an around Harlem are named, signed numbered. Structures and homes on the town perimeter are at the greatest risk to wildfire. Homes and structures that have flammable vegetation in close proximity are at the most risk.

The Harlem Fire Department and the Blaine County Fire Department in Harlem, provide protection from wildfire for Harlem and the surrounding areas. A municipal fire hydrant system provides adequate water for structure and wildland fires in town and within close proximity to town. Lack of water availability is a concern for the Blaine County Fire Department when responding to wildfires outside of Harlem because the turn around time for wildfire suppression is increased.

Mitigation Activities:
Mitigation of risk can be accomplished through implementation of a number of precautions. Creation of defensible space, an area next to the home or structure that contains green low growing vegetation into the fall and the use of noncombustible material for landscaping, would be most effective. An individual survey of homes or structures within and outside of Harlem would result in hazard identification and mitigation action that homeowners could accomplish. Yearly mitigation projects could include removal, mowing or burning of vegetation along irrigation canals. Ignition (controlled burns) of harvested grain fields, CRP lands, or irrigation canals will help create areas that are lower risk to wildfire. Such burns would require compliance with the Blaine County burning permit and coordination with the Harlem and Blaine County Fire Departments. Blaine County burning permit requirements should be enforced in the Harlem area.

4.1.2 Unincorporated Communities

4.1.2.1 Cleveland

Cleveland is a small unincorporated community located in the Bears Paw Mountains at the junction of the Cleveland Road aka County Highway 240 and Peoples Creek Road. Cleveland is approximately 27 miles south of Chinook.

Community Assessment:
Topography around Cleveland is more pronounced than other communities in Blaine County. The community contains light fuels. Some structures in Cleveland have defensible space while others have combustible vegetation in close proximity.

Cleveland has experienced a number of wildland fires from various ignition sources including lightning, machinery use and burning debris/vegetation. The 1991 Blaine County Fire burned within a few miles of Cleveland and closed Cleveland and Lloyd Roads. Residents and suppression resources were left with a long alternate route to and from Cleveland during the fire. The 1991 fire demonstrated that cured prairie grasses, CRP lands and grain stubble will carry an intense wildfire with extreme rates of spread during wind events. The area in an around Cleveland is at moderate risk to wildfires until vegetation cures and dry wind events occur creating a high risk.

Fire suppression for the Cleveland area is provided by the Blaine County Fire Department. Although suppression apparatuses are located near Cleveland, response times can be extensive to areas south of Cleveland. Blaine County has a memorandum of understanding with the Bureau of Land Management (BLM) for exchange of initial attack responsibilities for wildland fires. The BLM provides wildland fire initial attack suppression south of Peoples Creek in Blaine County. Water availability in the area is a concern.

Mitigation Activities:
Improvements in defensible space for homes and buildings in the Cleveland area are recommended as a simple and effective initial wildfire mitigation activity. Removal of cured vegetation around structures and retaining green vegetation as late in the fall as possible will decrease wildfire risk.

The heavier fuel loadings of CRP lands should be mowed and disked. Prescribed fires on CRP would also mitigate risk. Continued enforcement and adherence to the Blaine County burn permits will reduce risks.

4.1.2.2 Hogeland

Hogeland is a small agricultural community located 11 miles west of Turner on Hogeland Road and Murray Coulee and 10 miles south of the Canadian Border.

Community Assessment:
The Blaine County Fire Department has an engine stationed at Hogeland. Outlying areas have grain fields, CRP lands and prairie grasses.

Land around Hogeland is predominantly agricultural with gentle rolling topography. Grain fields in stubble or disked space surround the community. Cured grass up to14 inches in height occurs on various sites throughout the town. Defensible space is around the majority of structures in Hogeland ranging from 30 to 100 feet. Cured lawn grasses in the area could potentially carry wildfire in the late summer and fall. Hogeland is at moderate risk to wildfires defined by the fuel types in the area, historic ignitions and water availability. High risk occurs when fuels are cured in late summer and fall and are combined with dry wind events.

Ignition sources of wildfires in the Hogeland area include lightning, debris burning, machinery use, and other human causes. Vegetation on some lots in Hogeland present a wildfire risk to surrounding areas. Grain stubble, cured grain and CRP vegetation present a wildfire risk to homes in Hogeland and the surrounding area. High wind events increases this risk.

County roads around Hogeland are signed, but the lack of signage of the roads within Hogeland potentially could hinder emergency response. Water availability in Hogeland and outlying areas is a concern. Wildfire suppression response times in and close to Hogeland are good. Response times for areas around Hogeland increase with distance from town and are a concern. Rural areas outside of Hogeland rely on ground water wells for suppression of wildfires and the electricity to power the pumps are above ground.

Mitigation Activities:
Mitigation of wildfire risk in Hogeland can be initiated with mowing or removal of tall vegetation on properties in the community. Application of defensible space around homes and structures in the Hogeland area can be accomplished by the removal of fuels and providing green nonflammable landscaping for as long a possible in the fall.

Double row plow/disk of grain fields and CRP land around Hogeland and outlying farms and ranches will slow wildfires rates of spread and can be used during suppression activities. Mowing and/or prescribed fire to CRP lands in the Hogeland area would decrease fuel loading in the event of a wildland fire. Maintaining a water supply for homes in the Hogeland area is advisable due to the possibility of electrical power loss due to winds. For outlying areas, a time saving mitigation activity would be to obtain Global Positioning System (GPS) coordinates of groundwater wells for use in wildfire suppression and providing locations of Blaine County resources and mutual aid resources.

4.1.2.3 Savoy

Savoy is a small unincorporated community on North Savoy Road and old Highway 396. Located on the BNSF rail road line, Savoy is approximately 11 miles east of Harlem. Savoy is comprised of a small number of homes, barns and other structures. Agriculture lands surrounding the community include grain fields, pasture, and CRP lands. Savoy is at moderate risk to wildfire during most of the year and risk increases to high in the late summer and fall to high when vegetation cures and dry wind events occur.

Community Assessment:
Topography around Savoy is rolling with gentle slopes. Some homes and structures in the community have some defensible space, but the other homes and structures have continuous grass or other fire prone fuels between and abutting them.

Historic ignition sources in Savoy and the surrounding area have included the railroad, lightning, debris burning, machinery use, and other human causes.

Fuels in Savoy include low height cured grass, wheat stubble, and tall vegetation. In the surrounding area vegetation includes grain fields, CRP lands, prairie grasses and some cottonwood trees.

Fire suppression in Savoy is provided by the Blaine County Fire Department in Harlem. Response times are of concern because of distance and water availability. Water other than domestic use is not available in Savoy.

Mitigation Activities:
A recommended wildfire risk reduction activity in Savoy is to mow and remove cured vegetation between and adjacent to structures. Creation of defensible space for all structures should also be

implemented. Improvement of water storage capabilities at Savoy would provide Blaine County Fire Department with increased suppression capabilities.

CRP lands around Savoy have double row perimeter plow/disking, mowing and the initiation of prescribed burning or a combination of both.

Vegetation burning would be coordinated with the Blaine County Fire Department and would require compliance with a Blaine County burn permit.

4.1.2.4 Turner

Turner is a small unincorporated community located 10 miles south of the Canadian border on Highway 241 and the Turner Road. A few businesses, a grade school, church, park, small air strip and a number of homes make up the Turner Community. The Blaine County Fire Department has an engine barn and an engine in Turner.

Community Assessment:
The topography around Turner is gentle and rolling. Agricultural lands comprise most of the landscape. Most homes have a defensible space surrounding them. Areas of uncut cured vegetation ranging from 12 inches to 16 inches in height are interspersed throughout Turner. Part of Turner's perimeter are protected by areas of plowed/disked agricultural ground.

Grasses, CRP and harvested grains provide a fuel bed for wildfires surrounding Turner. Generally the Turner area consists of light fuels. Asset protection in Turner is assisted by the community park located on the south side of the town.

In 1985, the area around Turner experienced a fast moving wildland fire that burned 4,000 acres. The Turner community is rated at moderate risk to wildfires. The risk increases to high when vegetation cures and dry wind events occur. High risk normally occurs from August into November. Historic wildland fire ignitions in the Turner area have included lightning, machinery use, debris/vegetation burning, and other human caused ignitions. Homes and ranches located on the perimeter of Turner that lack defensible space are at high risk from wildfire during late summer and fall and times of extended drought.

County roads outside of Turner are signed. Roads within Turner are partially signed creating the potential for delayed response times. Landownership is kept and updated by Blaine County. Response time for fire suppression and water availability within Turner is adequate. Response times and water availability for wildfire suppression in outlying areas is not always adequate. Agriculture groundwater wells provide water for wildland fires in northern Blaine County. Groundwater well production is reliant upon above ground electrical supplies that are prone to hazards.

Mitigation Activities:
Specific mitigation activities for Turner include removal or mowing of cured vegetation within the community. Other mitigation activities include, establishment of a minimum of 40 feet defensible space for all dwellings and structures, establishment of a defined perimeter through plowing/disking of agriculture lands around Turner and maintenance of green grass in the park and on properties within and on the perimeter of Turner as late in the fall as feasible.

Mitigation for outlying areas and homes within CRP lands and grain fields include the establishment of a defensible space by the removal of vegetation adjacent and next to structures. Double row plow/disk

around CRP lands combined with mowing or the introduction of prescribed fire would mitigate wildfire spread.

Maintenance of a water supply for suppression of unplanned ignitions is advisable due to possible electrical power loss. Another beneficial activity is to obtain GPS coordinates of groundwater wells and water sources that could supply water for suppression of wildfires in rural response areas and make available the locations for wildfire mutual aid responders.

4.1.2.5 Zurich

Zurich is a small unincorporated community located on State Highway 2 and Zurich Road. The BNSF rail road line runs just south of Zurich. Chinook is approximately 10 miles east on Highway 2. A small number of homes and outbuildings comprise Zurich.

Community Assessment:
The topography at Zurich is gentle with cultivated agriculture fields of grains and groves of cottonwood trees. The majority of structures have defensible space. Some structures on the perimeter have combustible vegetation next to and adjacent to them.

A number of wildfires have occurred in the Zurich area. Ignition sources have included railroad, debris/vegetation burning and lighting.

Potential for wildfire risk in the Zurich area is deceptive due to the surrounding cultivated grain fields. Tall vegetation on the east and west sides of Zurich combined with cured grain fields or stubble creates a moderate wildfire risk. During dry wind events in late summer or fall the risk increases to high unless mitigation measures are taken to remove or modify the fuels.

Suppression of wildfires in the Zurich area is provided by the Blaine County Fire Department. Chinook and Harlem County fire engines also respond to fires near Zurich. Lack of water availability for emergency crews in the area increases the turn around time for suppression efforts.

Mitigation Activities:
Removal or mowing of tall cured vegetation on the edge of and within the community would decrease wildfire risk. Grain fields adjacent to Zurich could implement a double row plow/disk of fields that abut the community. Improvement of defensible space for homes on the perimeter of Zurich and increasing water storage options for summer and fall would also decrease the risk for wildfires.

4.1.3 Blaine County Fire Suppression Resources

Wildfire suppression resources within the County were obtained from survey questionnaires provided to full-time and volunteer fire departments within the county and the Blaine County Cooperative Management Plan of 2004 prepared by the DNRC Northeastern Area Office. A summary of wildfire suppression resources available to the county in the event of wildfire are presented in *Table 4-1* below**.**

TABLE 4-1
WILDFIRE SUPPRESSION RESOURCES

Fire Suppression Resource	Volunteer Staff		Equipment Details					
	Total	Active	Brush Trucks	Tender Trucks	Pump Trucks	Tanker Trucks	Other Trucks	SCBA's

TABLE 4-1
WILDFIRE SUPPRESSION RESOURCES

Fire Suppression Resource	Volunteer Staff		Equipment Details					
	Total	Active	Brush Trucks	Tender Trucks	Pump Trucks	Tanker Trucks	Other Trucks	SCBA's
Blaine County Fire Department	28	20	3	1	1		1 Command	7
Chinook Volunteer	28	20			2			11
Wilman Ranch (South of Chinook)					1			
F. Barber (South of Chinook)					1			
Cleveland Road (South of Chinook)					1			
Ross Rural (South of Chinook)					1			
Harlem Volunteer Fire Department	12	12	3	1	2	1	Command & water Trailer	4
Turner	28	10	2		1	2	1 command	9
Hogeland	20	15	3	2			5	6
Hartland Colony					1			
Mitchel Ranch (South Blaine)					1			
Hansen Ranch (South Blaine)					1			
Silverstons (South Blaine)					1			
Gorden Cattle Co (South Blaine)					2			
Thorstad (extreme South Blaine)						1		
Lloyd					1			

4.1.3.1 DNRC

Lewistown Northeastern Land Office provides the following fire suppression resources:
Aircraft

- Recon flights available with a County Fire Advisor if warranted and weather conditions permit
- Retardant aircraft available if warranted and weather conditions permit

Ground Resources

- Type-6 engines (Note: must coordinate availability from other counties where engines are located. None are located within Northeastern Land Office cache in Lewistown)
- Radio Cache - 15 programmable King portable radios
- 50 person mobile fire cache - radio equipped
- Mobile command trailer - radio equipped
- 1 ton 4X4 flatbed - radio equipped (set up to pull 20 ft. gooseneck flatbed trailer)
- ½ ton 4x4 pickup - radio equipped in 2004
- ½ ton 4x4 pickup - radio equipped
- ½ ton 4x4 pickup - radio equipped in 2004
- ½ ton 4x4 pickup - radio equipped (Incident Commander for County Assistance Team)
- ½ ton 4x4 pickup - radio equipped (IOFR for County Assistance Team)

4.1.3.2 Federal

The Zortman BLM office is not manned year round and is a seasonal station. The Central Montana BLM Fire Zone has the following resources. The type refers to resource capability. A type 1 resource provides a greater overall capability due to power, size, capacity, etc., than would be found in a type 2 resource:

Lewistown
- Type 3 Incident commander (IC)
- Three Type 6 engines
- Type 4 engine
- Type 1 water tender
- Type 3 helicopter w/crew
- Type 1 Air Attack platform with Air Tactical Group Supervisor (ATGS)

Zortman
- Type 4 IC
- Two Type 6 engines
- Type 4 engine

4.1.3.3 Blaine County VFD

The Blaine County VFD is a member of the Blaine County Fire Council which is made up of five fire departments. Emergency response to wildland fires has the greatest impact on the fire department followed by structural fires, Haz-Mat events and vehicle fires. Written Mutual Aid agreements are in place with neighboring (Fire Departments) FD's. Lack of funding, training and acquiring equipment are the top issues the department faces. Statewide Mutual Aid agreements also exist the VFD. Mutual Aid Agreements are in place with Chouteau, Hill, Liberty, Phillips, Valley Counties and including the city of Chinook, City of Harlem, City of Malta, and entities to the (Bureau of Indian Affairs) BIA and Fort Belknap Reservation. The Havre Fire Department has Emergency Medical Services (EMS) mutual aid with Blaine County. No taxing authority or contracts with tax districts exist for the VFD. The FD participates in a Firefighter Certification Program, but does not participate in the NWCG's "Red Card" Certification Program. The FD would participate in NWCG's advanced level fire fighter certification programs if offered. In-house training is about 5 hours per month and about 20 personnel attend fire training yearly. The FD possesses in its library the International Fire Service Training Association (IFSTA) Manuals. The Sheriff's office has the responsibility of dispatching the VFD. Fire suppression equipment for the Blaine County VFD is as follows:

- 7 Working SCBA's
- VHF (high band) 150-170 MHz communication equipment (narrow band compatible)
- Pager Service
- 1984 Brush Truck, 1 Ton, 200 gallon, 100pgm (DNRC owned)
- 1986 Brush Truck, ¾ Ton, 200 Gallon, 100 gpm (DNRC owned)
- 1985 Bruch truck, ¾ Ton, 200 gallon, 100 gpm
- 1988 Brush Truck, 1 ton, 300 gallon, 100 gmp
- 1980 Pumper Truck 2 ½ Ton 1100 gallon, 200 gpm
- 1985 Tender Truck, 5 Ton, 2850 gallon, 500 gpm
- 1984 Command Jeep

Blaine County provides the following equipment for fire suppression:

- D-7 Dozer
- 12 Road Patrols
- 4,000 gallon Tender
- 3 Dump Trucks
- 3 Belly Dump Trailers
- Loboy Trailer

4.1.3.4 Chinook VFD

The Chinook VFD has 28 Volunteer members, 20 of which are active members. Wildland and structure fires have the greatest impact on the fire department followed by structural fires, Haz-Mat events and vehicle fires. The concerns that impact the department the most are lack of funding, acquiring equipment and availability of fire fighters. The VFD is a member in the Blaine County Fire Council which consists of five Departments. Written mutual aid agreements are in place with neighboring FD's and the VFD is a member of a statewide mutual aid agreement. No taxing authorities or contracts with a tax district are in place with the FD. The City of Chinook has mutual aid agreements with the Havre Fire Department. Volunteers participate in a fire fighter certificate program, but fire fighters don not participate in the NWCG "Red Card" Certification for Wildland Firefighting. The FD would not participate in NWCG advanced level firefighter certification if offered. Approximately 20 people attend fire training per year. International Fire Service Training Association Training (IFSTA) Manuals are maintained in the FD's library. Radio equipment the fire department maintains ins not narrow band compatible. Dispatching is provided by the Sheriff's Department. Fire suppression equipment for the Chinook VFD is as follows:

- 1968 2 ½ ton, 1,000 gallon engine, 100 gpm Radio Equipped
- 400 gallon engine, Radio Equipped
- 1984 2 ½ ton 1500 gpm pump
- 1100 gallon engine and tender
- 200 gallon engine (State owned), Radio Equipped,
- 235 gallon engine, Radio Equipped
- 3,000 gallon engine & tender, Radio Equipped,
- Command Vehicle (94 Jeep 4x4 Wrangler), Radio Equipped
- 200 gallon engine (State owned), Radio Equipped
- 11 working SCBA's
- Pager system

4.1.3.5 Harlem VFD

The Harlem fire department has a crew of 12 active volunteer members. The department is a member of the Blaine County Fire Council which is made up of five departments. Wildland fires have the greatest impact on the fire department followed by Haz-Mat events, search & rescue tasks, structural fires and vehicle fires. Written mutual aid agreements exist with Neighboring FD's. The VFD is a member of a statewide mutual aid agreement. No taxing authority or contract with a tax district exists for the FD. The VFD does not participate in a firefighter certification program and doesn't participate in the NWCG Wildland Firefighter "Red Card" certification program. If offered the FD would participate in NWCG Wildland Fire courses included in the advanced level firefighter certification. The FD is dispatched by the County Sheriff's Department. Equipment resources available at the Harlem VFD are as follows:

- 1974 F600, 2 ½ ton 1,000 gallon engine, 100 gpm. Radio Equipped
- 1984 1 ton, Brush Truck, 200 gallon engine, 100gpm, (State-owned), Radio Equipped
- 1996 F350 1 ton, 200 gallon, 100 gpm, Brush Truck,
- 1977 Dodge, Brush Truck, 200 gallon, 100 gpm, Radio Equipped
- 1973, 3,000 gallon water tender, Radio Equipped
- 1988, 1,000 gallon engine, 500 gpm, 2.5 ton, Radio Equipped
- 1975, Command vehicle, F250, Radio Equipped
- 1984 Engine, 500 gallon tank.
- Two 200 gallon engine (spray rig)
- 4 working SCBA's
- Pager system

Harlem between 2001 and 2003 received a portion of the $30,500 dollars awarded to Blaine County in Volunteer and Rural Fire Assistance (section 6.4) from the DNRC to purchase the following equipment:

- Honda Pump
- Honda Generator
- Monarch Pump
- Poly Tank
- Trailer
- Fire Boots (PPE)

4.1.3.6 Hogeland VFD

Equipment resources available at the Hogeland VFD are as follows:

- 2,000 gallon water tender, Radio Equipped
- 1250 gpm pumber
- 800 gallon engine, 1,250 gpm, Radio Equipped
- 200 gallon engine (State-owned), Radio Equipped
- 250 gallon engine, Radio Equipped, Frequencies Table 2
- 500 gallon engine
- 750 gallon engine

Hogeland between 2001 and 2003 received a portion of the $30,500 dollars awarded to Blaine County in Volunteer and Rural Fire Assistance (section 6.4) from the DNRC to purchase the following equipment:

- Rebuilt Dodge Truck
- 2 Nomex Hoods
- Helmets
- Fire Boots (PPE)

4.1.3.7 Turner VFD

The Turner VFD has a response area of approximately 600 square miles. The department is made up of 28 volunteers of which 12 are active members. Wildland fires impact the department the most followed by structural fires, vehicle fires, medical/EMS response, Haz-Mat events and search and rescue efforts. Major issues impact the department are lack of funding, member recruitment/retention, training and equipment that is in poor condition. Other issues that impact the department include community

support, prevention/education resources, firefighter availability, and records and reports management. The department is not a member of a local association. Written mutual aid agreements exist with Neighboring FD's. The FD is a member of a statewide mutual aid agreement. No taxing authority or contracts with a tax districts are in place for the FD. Sources of funding for the VFD include donations and fundraisers. Volunteers are not equipped with wildland fire protective gear. Volunteers do not participate in a firefighter certification program and the FD does not participate in the NWCG Wildland Firefighter "Red Card" Certification Program. If offered, FD members would be willing to participate in NWCG wildland fire courses that include advanced level fire fighting certification. In house training for volunteers is an average of three hours per month. Eight volunteers attend fire training yearly. The FD does not maintain the International Fire Service Training Association (IFSTA) manuals in its library. Communication equipment is narrow band compatible. Dispatching is provided by the Sheriff's Department. Equipment resources available at the Turner VFD are as follows:

- 1978 Pump Truck 1,000 gallon engine, 500 gpm, Radio Equipped
- 1967 Brush Truck, 400 gallon engine, 300 gpm, Radio Equipped
- 1979 3 ton, 1,500 gallon tender (tanker) , Radio Equipped
- 1991 5 ton, 2,000 gallon water tender (tanker), 300gpm, Radio Equipped
- 1963, 1 Ton, 200 gpm, 400 gallon engine, GMC
- 1985 Brush Truck, 200 gpm, 400 gallon engine, 1985 GMC
- Command & Rescue, 1979 GMC ¾ ton.
- 9 working SCBA's

Turner between 2001 and 2003 received a portion of the $30,500 dollars awarded to Blaine County in Volunteer and Rural Fire Assistance (section 6.4) from the DNRC to purchase the following equipment:

- 1 Maxon Radio
- 450 Gallon Tank
- Person Protection Equipment
- Tank, Pump and Hose Reel for Slip on Unit

4.1.3.8 Lohman VFD

Equipment resources available at the Lohman VFD are as follows:

- 200 gallon slip-on unit, Not radio equipped

4.1.3.9 DNRC

Lewistown DNRC Northeastern Land Office provides the following fire suppression resources to Blaine County:

Aircraft

- Recon flights available with a County Fire Advisor if warranted and weather conditions permit
- Retardant aircraft available if warranted and weather conditions permit

Ground Resources

- Type-6 engines (Note: must coordinate availability from other counties where engines are located. None are located within Northeastern Land Office cache in Lewistown)
- Radio Cache - 15 programmable King portable radios
- 50-person mobile fire cache - radio equipped
- Mobile command trailer - radio equipped
- 1 ton 4X4 flatbed - radio equipped (set up to pull 20 ft. gooseneck flatbed trailer)
- ½ ton 4x4 pickup - radio equipped in 2004

- ½ ton 4x4 pickup - radio equipped
- ½ ton 4x4 pickup - radio equipped in 2004
- ½ ton 4x4 pickup - radio equipped (Incident Commander for County Assistance Team)
- ½ ton 4x4 pickup - radio equipped (IOFR for County Assistance Team)

4.1.3.10 Other Wildfire Suppression Resources:

Badlands
- 300 gallon engine, Radio Equipped, Location: Hansen Farms, NW¼, Sec. 24, T31N, R21E

Frank Barber
- 200 gallon engine (State owned), Radio Equipped, Location: NE¼SE¼, Sec. 4, T28N, R18E

Hartland Colony
- 200 gallon engine, Radio Equipped

Lloyd
- 300 gallon engine, Radio Equipped, Location: Dale Hofeldt, SE¼, Sec. 31, T30N, R19E

Lonetree
- 300 gallon engine, Radio Equipped, Location: Walter Bold
- 200 gallon engine, Radio Equipped

Mitchell Ranch
- 200 gallon engine (State-owned), Radio Equipped, Location: Doug Mitchell, SW¼, Sec. 8, T28N, R21E
-

Robinson
- 200 gallon engine, slip-on

Ross Ranch
- 300 gallon engine, Radio Equipped, Location: Clear Creek, NE¼, Sec. 36, T30N, R17E
- 1,000 gallon tender, Radio Equipped

Sivertsen Ranch
- 200 gallon engine (State-owned), Radio Equipped, Location: L. Sivertsen, NW¼, Sec. 3, T26N, R18E

NorthWest Energy
- NorthWest Energy provides 24 hour incident hotlines specific for First Responders for Electric and Natural Gas emergencies. Northwest Energy Personnel are on call 24 hours a day and are trained to respond to the command center (if one is set up) and work closely with fire and law enforcement personal.

- Northwest Energy personnel are also available to provide guidance and assist firefighters in pole fires and fires at Substations.

- Compressor stations are above ground and provide pressure for underground natural gas pipelines to push the gas on to the next station. Northwest Energy employees are available to give tours of compressor stations and explain what to do in the event of emergencies. Most of the compressor stations are located in rural areas.

4.2 FUELS

Fire risk is influenced to a large extent by the fuel available to the fire. The primary fuel for wildfire is vegetation. The species composition, structure and amount of vegetation heavily influence fire behavior, intensity, rate of spread, and flame lengths. In the context of fire behavior, the vegetation can be described in terms of fuel models that estimate fire behavior based on vegetation type. The Fuel model used for this plan is based on the 13 standard Anderson Fire Behavior models (Anderson 1982).

Anderson Model:

Grass and Grass-Dominated Group
1 Short Grass (1 Foot)
2 Timber (Grass And Understory)
3 Tall Grass (2.5 Feet)

Chaparral and Shrub Fields Group
4 Chaparral (6 Feet)
5 Brush (2 Feet)
6 Dormant Brush, Hardwood Slash
7 Southern Rough

Timber Litter Group
8 Closed Timber Litter
9 Hardwood Litter
10 Timber (Litter And Understory)

Slash Group
11 Light Logging Slash
12 Medium Logging Slash
13 Heavy Logging Slash

The National Land Cover Dataset (NLCD) from the U.S. Geological Survey (USGS) was used for vegetation and landuse for the area of study. ***Map 4-1*** depicts vegetation types for the project area. *Table 4-2* summarizes acres in the project area by vegetation type.

Table 4-2 Blaine County NLCD Acreage Totals

TABLE 4-2
BLAINE COUNTY NLCD ACREAGE TOTALS

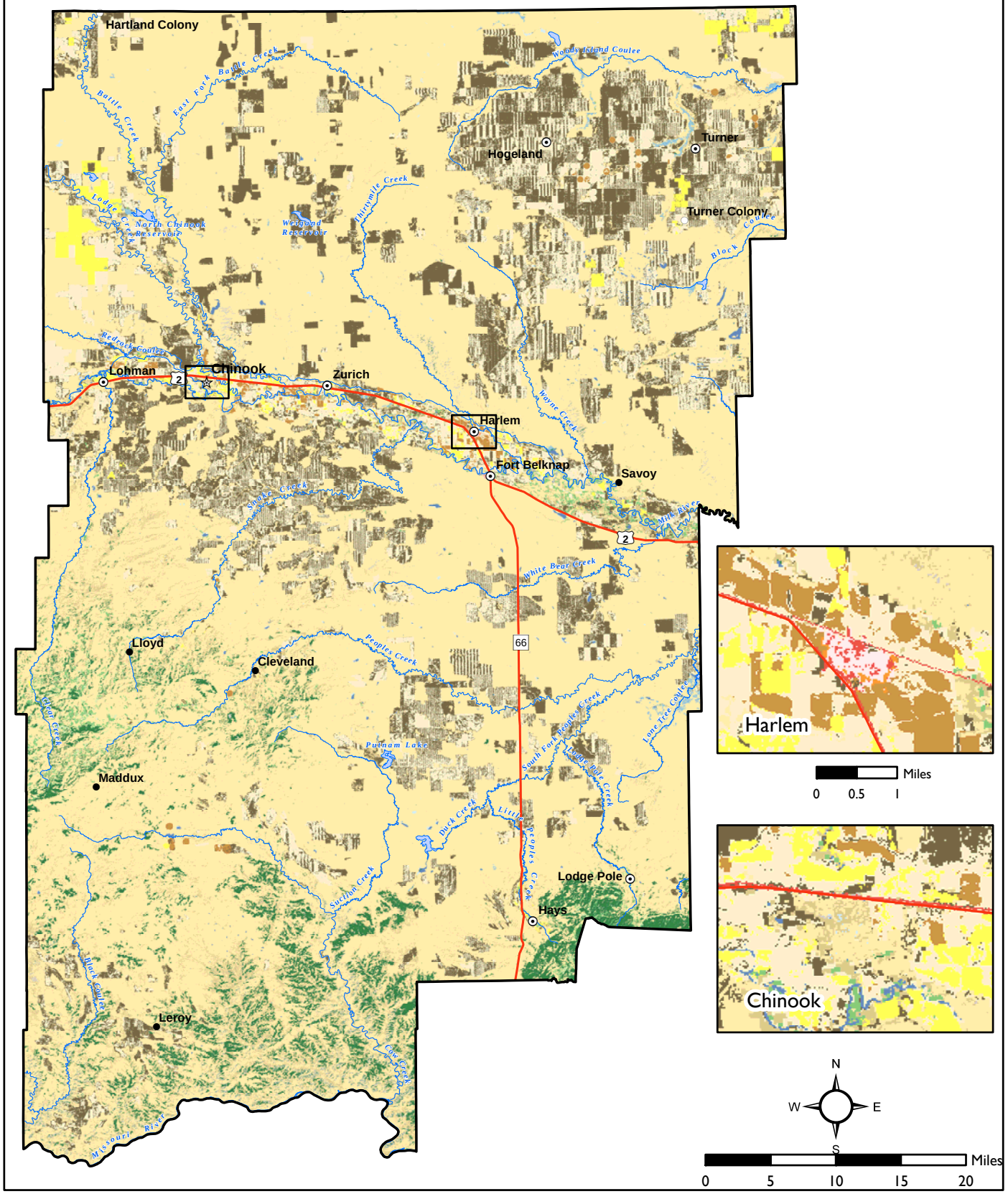
NLCD Code	NLCD Description	Acres
11	Open Water	8,914
21	Low Intensity Residential	320
23	Commercial/Industrial/Transportation	1,742
31	Bare Rock/Sand/Clay	12,225
32	Quarries/Strip Mines/Gravel Pits	2
33	Transitional	0
41	Deciduous Forest	16,615
42	Evergreen Forest	91,976

TABLE 4-2
BLAINE COUNTY NLCD ACREAGE TOTALS

NLCD Code	NLCD Description	Acres
43	Mixed Forest	2,929
51	Shrubland	180,016
71	Grasslands/Herbaceous	1,698,064
81	Pasture/Hay	27,429
82	Row Crops	9,592
83	Small Grains	312,866
84	Fallow	340,790
85	Urban/Recreational Grasses	37
91	Woody Wetlands	3,068
92	Emergent Herbaceous Wetlands	4,731

As can be seen in *Table 4-2* Blaine County is primarily grassland, small grain, and row crops. Grassland in the project area is both grazing land and farmland that is currently in the Natural Resource Conservation Service (NRCS) Conservation Reserve Program (CRP). There is a significant amount of land in the CRP program in the project area and land is consistently being added and retracted from the CRP. In 2004, the total active amount of CRP land in Blaine County was 162,854 acres which account for 6.01 percent of the total acreage in the county. NLCD vegetation types were assigned Anderson fuel model codes and canopy coverage as shown in *Table 4-3*.

Blaine County



- Open Water
- Low Intensity Residential
- Commercial/Industrial/Transporation
- Bare Rock/Sand/Clay
- Quarries/Strip Mines/Gravel Pits
- Transitional
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrubland
- Grassland/Herbaceous
- Pasture/Hay
- Row Crops
- Small Grains
- Fallow
- Urban/Recreational Grasses
- Woody Wetlands
- Emergent Herbaceous Wetlands

Land Cover
Blaine County
Northeast Montana
Community Wildfire Preparedness Plan
Map 4-1

TABLE 4-3
NLCD TO FLAMMAP CODE CONVERSIONS

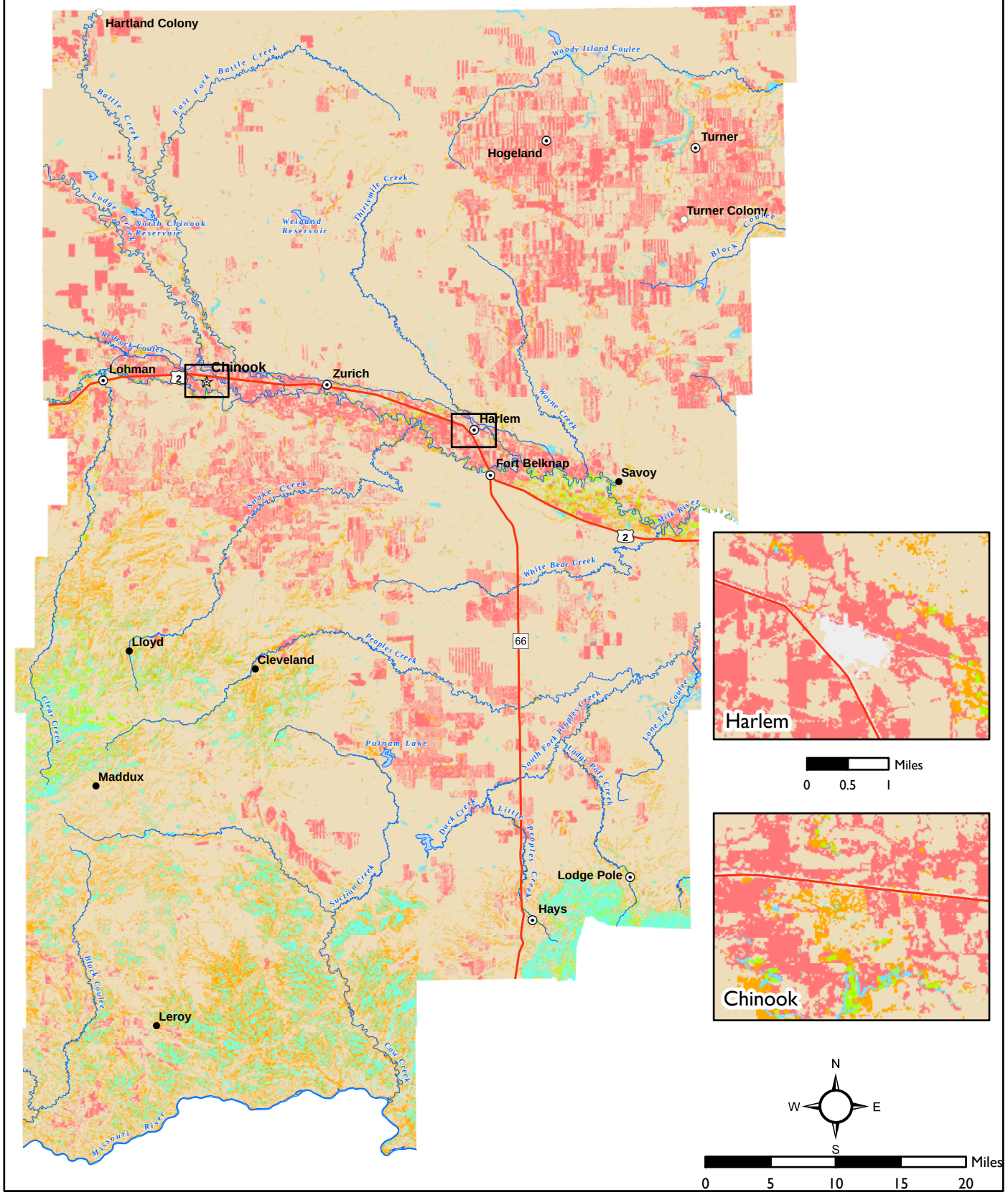
NLCD Code	NLCD Description	FlamMap/Anderson Code	FlamMap/Anderson Description	Canopy Coverage
0	Null	0	Null	0%
11	Open Water	98	Water	0%
12	Perennial Ice/Snow	99	Barren	0%
21	Low Intensity Residential	99	Barren	0%
22	High Intensity Residential	99	Barren	0%
23	Commercial/Industrial/ Transportation	99	Barren	0%
31	Bare Rock/Sand/Clay	99	Barren	0%
32	Quarries/Strip Mines/ Gravel Pits	99	Barren	0%
33	Transitional	99	Barren	0%
41	Deciduous Forest	9	Hardwood litter	50%
42	Evergreen Forest	8	Closed timber litter	50%
43	Mixed Forest	8	Closed timber litter	50%
51	Shrubland	2	Timber (grass and understory)	0%
61	Orchards/Vineyards/Other	9	Hardwood litter	70%
71	Grasslands/Herbaceous	1	Short grass (1 ft.)	0%
81	Pasture/Hay	1	Short grass (1 ft.)	0%
82	Row Crops	1	Short grass (1 ft.)	0%
83	Small Grains	3	Tall grass (2.5 ft.)	0%
84	Fallow	1	Short grass (1 ft.)	0%
85	Urban/Recreational Grasses	1	Short grass (1 ft.)	0%
91	Woody Wetlands	8	Closed timber litter	20%
92	Emergent Herbaceous Wetlands	98	Water	0%

The Anderson model contains 13 fuel models that are organized into four groups. *Table 4-4* summarizes total acreage by fuel type and ***Map 4-2*** depicts fuel type distributions for Blaine County. As the map and table clearly indicate the county is primarily composed of fuels in the Grass and Grass-Dominated Group - Anderson types 1 & 2. These groups support fast moving ground fires of low to moderate intensity. Anderson type 3 is composed of small grains. Cured small grains sustain the highest heat and fastest spreading fires in the county. Grass and brush fires represent the greatest wildland fire hazard for the project area.

CRP grassland may not be adequately represented in the fire model. In some cases CRP grasslands should be designated as Tall Grass but they are designated Short Grass as there is no means to distinguish these areas from the surrounding native grasslands and range lands. Most CRP lands are interspersed within small grain areas and are thus within the designated high fire hazard areas.

The other primary fuel type in Blaine County is Closed Timber Litter (Fuel Model 8). Fuel Model 8 supports slow burning ground fires with low flame lengths.

Blaine County



Anderson Fuel Types

- 1 - Short Grass (1 Ft.)
- 2 - Timber (Grass And Understory)
- 3 - Tall Grass (2.5 Ft.)
- 8 - Closed Timber Litter
- 9 - Hardwood Litter
- 98 - Water
- 99 - Barren

Fuel Types
Blaine County
Northeast Montana
Community Wildfire Preparedness Plan
Map 4-2

TABLE 4-4 *ANDERSON FUEL TYPE BY TOTAL ACREAGE FOR BLAINE COUNTY*		
FlamMap/Anderson Code	**FlamMap/Anderson Description**	**Acres**
1	Short Grass (1 Ft.)	2,075,912
2	Timber (Grass And Understory)	180,016
3	Tall Grass (2.5 Ft.)	312,866
8	Closed Timber Litter	97,973
9	Hardwood Litter	16,615
98	Water	13,645
99	Barren	14,290

4.3 WEATHER

Wildfire behavior is significantly affected by local weather conditions. Important weather conditions to consider include: relative humidity which affects moisture content of the air and fuels; wind which affects the direction and speed of fire spread; and air temperature which affects the ambient temperature of the fire fuels. All three factors also affect fuel drying times.

Fire conditions worsen as temperature increases and relative humidity decreases. Wind speeds in excess of 10 mph also begin to increase fire intensity, the rate of fire spread and growth by adverse fire behavior and spotting. Fires become most difficult to control when relative humidity falls below 30 percent.

The most important weather characteristics for Blaine County related to fire risk are precipitation (lack of), humidity, thunder storms, and wind.

Annual average precipitation in Blaine County is 10 to 12 inches, except up to 20 inches in the higher elevations of the Bears Paw Mountains. Over 65 percent of the annual precipitation total falls from May through September. November through March, are on average quite dry with average monthly precipitation of 0.50 inches or less.

Humidity in the region is often quite low with normal averages of 30 to 40 percent in the afternoons from April to October and from 40 to 70 percent in the afternoons from November to March. Morning humidity is generally around 70 percent throughout the year (NWS 2005). *Table 4-5* shows the monthly average percentage of humidity in Blaine County.

TABLE 4-5 *BLAINE COUNTY AVERAGE HUMIDITY PER MONTH*		
Month	**Average Morning Humidity (%)**	**Average Afternoon Humidity (%)**
January	72	67
February	73	62
March	75	53
April	72	42
May	72	40
June	75	41

TABLE 4-5
BLAINE COUNTY AVERAGE HUMIDITY PER MONTH

Month	Average Morning Humidity (%)	Average Afternoon Humidity (%)
July	71	33
August	68	31
September	70	37
October	71	45
November	73	61
December	73	67
Source: NWS 2005		

Severe thunderstorms pose two significant hazards related to wildfire. The first is the lightning strikes that accompany thunder storms often trigger single or multiple ignition points on the ground. These fledgling wildfires often occur away from roads and are difficult for response personnel to reach. The second negative influence of these storms comes in the form of high winds. Wind is the most unpredictable force and has the greatest impact on a fire behavior. Winds supply fires with additional oxygen, further dry potential fuel, can unexpectedly change the direction of fire spread, and can increase the rate of fire spread.

Average wind speeds in Blaine County range from 10 to 15 mph, depending on the exposure of the location. The average and peak sustained winds in the Milk River Valley and Missouri River valleys tend to be somewhat less then the winds over the higher more exposed terrain in the northern and west central portions of the county. The highest sustained winds tend to occur in the spring and fall, with sustained winds over 40 mph occurring every year (NWS 2005). Regionally the largest and most dangerous fires have occurred in the late summer and fall when high winds can cause very fast moving fires over large expanses of dry, light fuels. *Table 4-6* demonstrates the percentage of fires that occur based on the month of year.

TABLE 4-6
PERCENTAGE OF FIRES OCCURRING PER MONTH
BLAINE COUNTY

Month	Percent
January	0.39%
February	1.56%
March	2.34%
April	8.20%
May	8.20%
June	10.55%
July	27.34%
August	26.95%
September	10.16%
October	2.73%
November	1.17%
December	0.39%
Source: County and Local VFD's and Blaine County Officials, BLM	

4.4 TOPOGRAPHY

Topography plays an influencing role in the context of wildfire behavior. Wooded or brush covered slopes generally promote the spread of the flame front up gradient. The speed at which the fire progresses is directly proportional to the slope of the hillside and the nature of the fuel available. Generally the steeper the slope the faster wildfires travel up gradient. Fire also travels the direction of the ambient wind which is usually upslope. As the flame reaches the crest of the slope fire migration typically slows or follows the next incline of the intersecting slope.

The topography of Blaine County includes plains, mountains, and badlands. Elevations in Blaine County range from about 2,300 feet above mean sea level along the Milk River to about 6,000 feet in the Little Rocky Mountains in the extreme southeastern portion. Making up the northern two-thirds of the county are the glaciated plains which range in elevation from 2,300 to 3,800 feet. The Milk River Valley extends east-west through the north-central part of Blaine County. Elevations range from 2300 to 2500 feet and the land is mostly irrigated crops. Northeastern Blaine County, which is also known as the "Big Flat" area has elevations ranging from 3,000 to 3,400 feet and unlike the other areas has a poor drainage system. The Bears Paw Mountains have elevations ranging from 3,300 to 6,000 feet. Elevation in the Little Rocky Mountains ranges from 4,000 to 6000 feet, the relief is mostly rugged and the north and east-facing slopes are forested (USDA 1986). The Missouri River Breaks form an area of badlands along the southern boundary of the county. The general topography is represented in ***Map 4-3.***

4.5 WILDLAND/URBAN INTERFACE

Wildland/urban interface is defined as the zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel. WUI areas are at high risk for loss to property and human life during wildfire events. In Blaine County, the wildland/urban interface typically is where the edge of local communities adjoin agricultural fields, many of which are in the Conservation Resource Program (CRP).

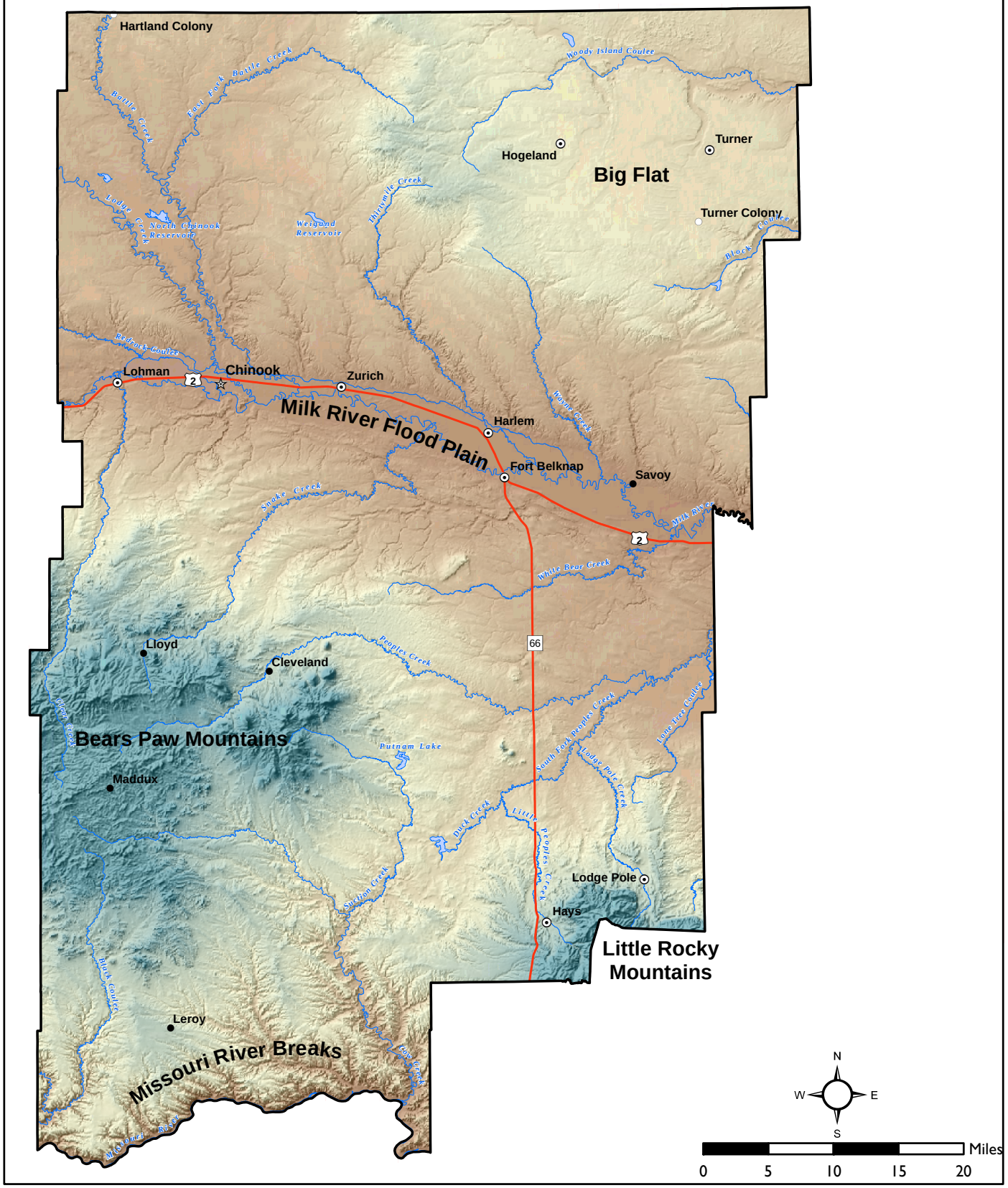
A model based on the Federal Register definition of WUI (Federal Register 66:751, 2001) was used in this plan to define and map the WUI. The approach used utilized the National WUI GIS layer developed by the Spatial Analysis for Conservation and Sustainability (SILVIS) Lab in the Department of Forest Ecology & Management at the University of Wisconsin - Madison. The SILVIS WUI layer was modified slightly to account for regional differences particular to the project area.

The two primary data elements used to define the WUI are:

Housing density - Housing density was derived from the 2000 U.S. Census block level data. Densities were compiled as the number of housing units per square kilometer.

Landcover - The National Land Cover Dataset (NLCD) produced by the USGS was used to define wildland vegetation. NLCD is based on 30m resolution satellite imagery from 1992/1993. The SILVIS definition of wildland vegetation included forests, native grasslands, shrubs, wetlands, and transitional lands. It excluded most types of agricultural lands and pasture. The SILVIS definition does not adequately account for the fire hazards presented by agricultural lands in Blaine County. For Blaine County the SILVIS wildland vegetation definition was modified to include agriculture lands. *Appendix E* contains a specific description of the reclassification of vegetation used for the Blaine County WUI.

Blaine County



Elevation (ft.)

High : 5989

Low : 2272

Topography
Blaine County
Northeast Montana
Community Wildfire Preparedness Plan
Map 4-3

The WUI includes areas defined as either interface or intermix. In both areas, housing must meet or exceed a minimum density of one structure per 40 acres (16 ha). In intermix areas wildland/agricultural vegetation comprises more than 50 percent of the vegetation with more than 1 house per 16 hectares (ha). Interface areas have more than 1 house per 40 acres, contain less than 50 percent wildland/agricultural vegetation, and are within 1.5 mi of an area over 1,325 acres (500 ha) that is more than 75 percent vegetated.

Two classes were added in addition to the SILVIS classes - Uninhabited Agricultural and Sparsely Inhabited Agricultural. Uninhabited Agricultural includes areas with no housing units and agricultural vegetation greater than 50%. Sparsely Inhabited Agricultural includes areas with a housing density greater than 0 but less than one structure per 40 acres. These classes were split out of the Uninhabited with No Vegetation and Wildland with No Vegetation classes.

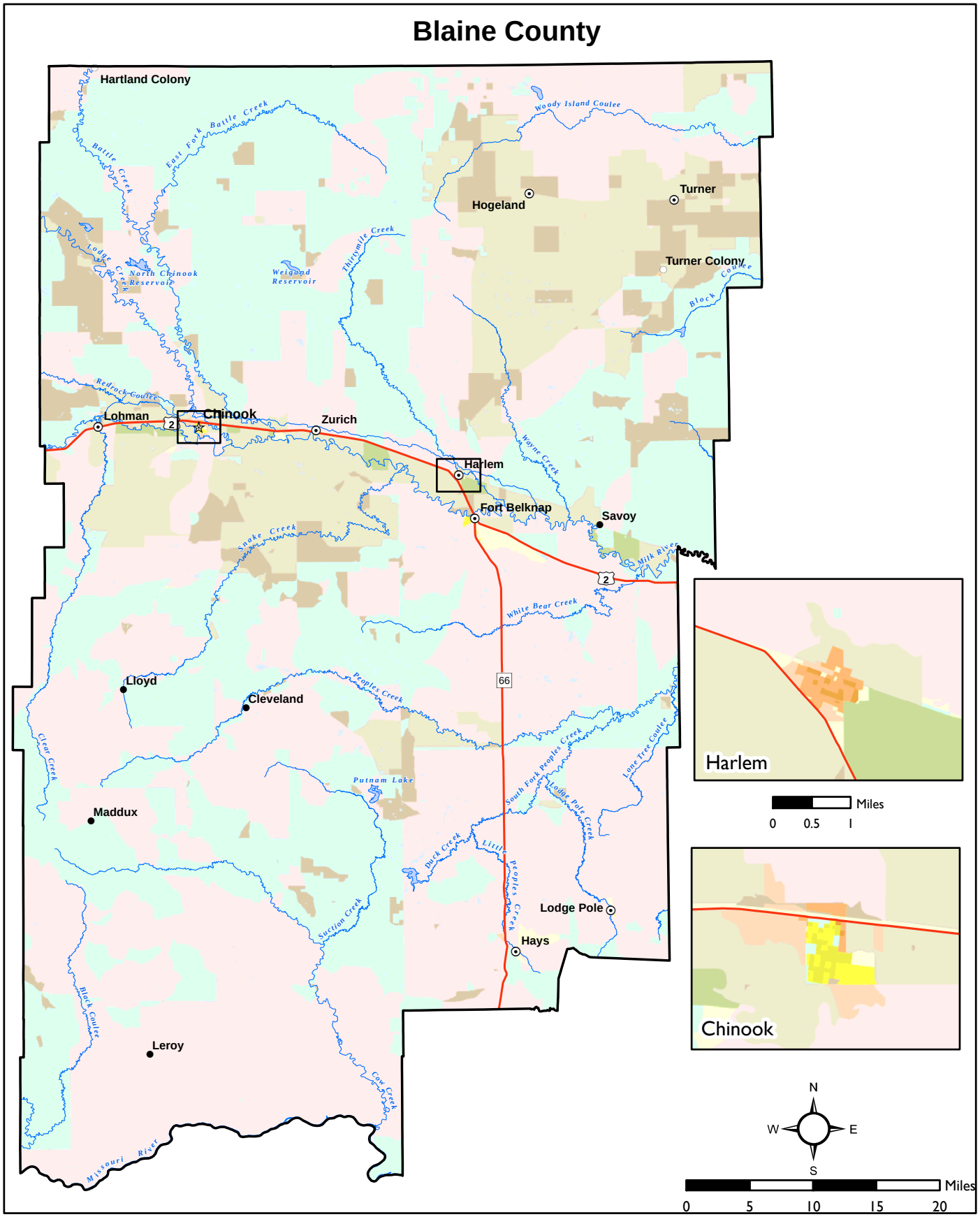
Wildland Urban Interface areas within Blaine County are presented in *Table 4-7*. Intermix, Interface, Sparsely Inhabited and Uninhabited areas are further broken down into sub levels. These interface buffers are also graphically depicted in ***Map 4-4.***

TABLE 4-7
DISTRIBUTION OF WILDLAND / URBAN INTERFACE TYPES

Wildland / Urban Interface Type	**WUI Attributes**	
	Acres	**Percent of Total**
Low Density Intermix	7,122	0.3%
Medium Density Intermix	504	0.0%
High Density Intermix	126	0.0%
Wildland Intermix	1,256,527	46.6%
Total Intermix Acres	**1,264,279**	**46.9**
Low Density Interface	1,022	0.0%
Medium Density Interface	350	0.0%
High Density Interface	61	0.0%
Total Interface Acres	**1,433**	**0.1%**
Sparsely Inhabited Agricultural	324,133	12.0%
Wildland with No Vegetation	9,234	0.3%
Total Sparsely Inhabited Acres	**333,367**	**12.4%**
Uninhabited Agricultural	156,448	5.8%
Uninhabited with Vegetation	940,483	34.9%
Uninhabited with No Vegetation	1,578	0.1%
Total Uninhabited Acres	**1,098,509**	**40.7%**
Total Acres	**2,697,588**	**100.0%**

Fifty-nine percent of the area in Blaine County is dispersed low density habitation surrounded by wildland and agricultural fuels. Virtually all town areas are defined as Intermix or Interface. Forty one percent of the county is uninhabited. Most of the structures and habitations in the county are exposed to some level of wildland fire risk.

Blaine County



Low_Dens_Intermix
Med_Dens_Intermix
High_Dens_Intermix
Wildland_Intermix
Low_Dens_Interface
Med_Dens_Interface
High_Dens_Interface
Sparse_Ag
Uninhabited_Ag
Uninhabited_NoVeg
Uninhabited_Veg
Wildland_NoVeg
Water

Wildland/Urban Interface Areas
Blaine County
Northeast Montana
Community Wildfire Preparedness Plan
Map 4-4

4.6 HISTORICAL WILDFIRE EVENTS

A wildfire is an unplanned fire, a term which includes grass fires, forest fires and scrub fires caused by man or natural in origin. Severe wildfire conditions have historically represented a threat of potential destruction within Montana.

According to the National Interagency Fire Center (NIFC) unofficial statistics prepared for 2004, the state of Montana had a total of 2,267 wildland fires which consumed a total of 64,374 acres. Of these fires, 787 were prescribed burns impacting a total of 44,634 acres. Twenty five fires impacting 1,294 acres were designated as Wildland Fire Use (NFIC 2005). Distribution of land ownership and management for these fires is presented in *Table 4-8* below.

TABLE 4-8
DISTRIBUTION OF 2004 WILDFIRE LAND OWNERSHIP / MANAGEMENT FOR MONTANA

Agency / Manager	Wildland Fires		Prescribed Fires		Wildland Fire Use	
	Number of Fires	Number of Acres	Number of Fires	Number of Acres	Number of Fires	Number of Acres
Bureau of Indian Affairs (BIA)	448	3,076	50	3,598	0	0
Bureau of Land Management (BLM)	63	1,564	10	2,872	0	0
Fish and Wildlife Service (FWS)	8	708	6	2,885	0	0
National Parks Service (NPS)	5	1	2	20	9	0
Other	55	105	0	0	0	0
State of Montana	299	9,249	57	2,340	0	0
US Forest Service (USFS)	577	3,743	662	32,919	16	1,294
State of Montana 2004 Totals	**1,455**	**18,446**	**787**	**44,634**	**25**	**1,294**

Source: NIFC 2005

According to survey information obtained from local fire officials within and adjacent to Blaine County, a number of wildfires have occurred. *Table 4-9* summarizes fire information collected from county officials and *Table 4-10* summarizes fire information collected from BLM officials these historical occurrences below. The complete listing for historic wildfire occurrences for this region are presented in *Appendix F.*

TABLE 4-9
SUMMARY OF COUNTY REPORTED HISTORICAL WILDFIRE CAUSES HUMAN VS. NATURAL

Year of Record	Statistical Fire Details			
	Total Wildfires	Human Cause	Natural Cause	Not Specified
1990	10	6	0	4
1991	15	14	1	
1992	14	13		1
1993	6	4		2
1994	12	8	3	1
1995	5	5		
1996	4	3	1	

TABLE 4-9
SUMMARY OF COUNTY REPORTED HISTORICAL WILDFIRE CAUSES
HUMAN VS. NATURAL

Year of Record	Statistical Fire Details			
	Total Wildfires	Human Cause	Natural Cause	Not Specified
1997	6	1	4	1
1998	8	4	3	1
1999	5	4		1
2000	6	3	1	1
2001	9	8		1
2002	3		1	2
2003	10	2	5	3
2004	6	2	3	1
Total	119	77	22	19

Source: County and Local Volunteer Fire Departments and Blaine County Officials,

TABLE 4-10
SUMMARY OF BLM REPORTED HISTORICAL WILDFIRE CAUSES
HUMAN VS NATURAL

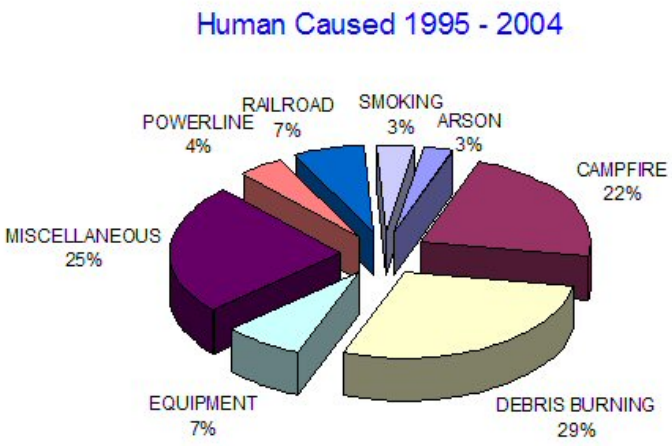
Year of Record	Statistical Fire Details			
	Total Wildfires	Human Cause	Natural Cause	Not Specified
1980	5	1	3	1
1981	12	1	9	2
1982	5	1	2	2
1983	9		3	6
1984	8		5	0
1985	3		3	0
1987	2		2	0
1988	6		5	1
1989	10		8	2
1990	3		2	1
1991	5		5	0
1993	1		1	0
1994	6		3	3
1995	1		1	0
1996	8		7	1
1997	4	1	2	1
1998	4		4	0
1999	7		6	1
2000	5	1	4	0
2001	1		1	0
2002	1		1	0
2003	8		8	0
Total	111	5	85	21

Source: BLM

4.7 IGNITION RISKS

According to the DNRC Forestry Division – Fire and Aviation Management Bureau, 2004 fire statistics indicated lightning was the most common ignition source for the year with 162 instances throughout the state, followed by debris burning 59 instances, and campfires with 45 instances. Other ignition causes included railroads, power lines, equipment, smoking, fireworks, debris burning and miscellaneous causes. Power line fires are caused by sparking, arcing or other means by any electrical transmission line. This includes, but is not limited, to lines downed by winds or other natural events, lines pushed into surrounding vegetation by wind events or vegetation growing into power lines in poorly maintained right of ways. Equipment fires are fires caused by mechanical equipment other than railroad operations such as airplane crashes, exhaust pipes, fuel sparks, electrical equipment, chain saws or broken electrical fences. Smoking fires caused by smoker's matches, lighters or by burning tobacco in any form, but excludes smoking by railroad personnel. Debris burning ignitions are considered to be any fire originally intentionally set for hazard reduction, clean-up, site preparation, or fuel manipulation that is illegal, abandoned or spreads and requires suppression action. Fires set to clear land and burn trash, stubble, meadow, rights-of way, logging slash, dumps or other prescribed burning are included. Excluded is debris burning by railroad operations. Lightning can present particularly difficult problems when dry thunderstorms move across an area suffering from seasonal drought. In north-central Montana, the railroad is a common ignition source of wildfires. Railroad fires are those caused by all railroad operations, including burning of rights-of-way, construction, operation or maintenance. This includes fires from carbon sparks, brake shoes, hose, fuses, or carelessness of any employee or passenger (DNRC 2004).

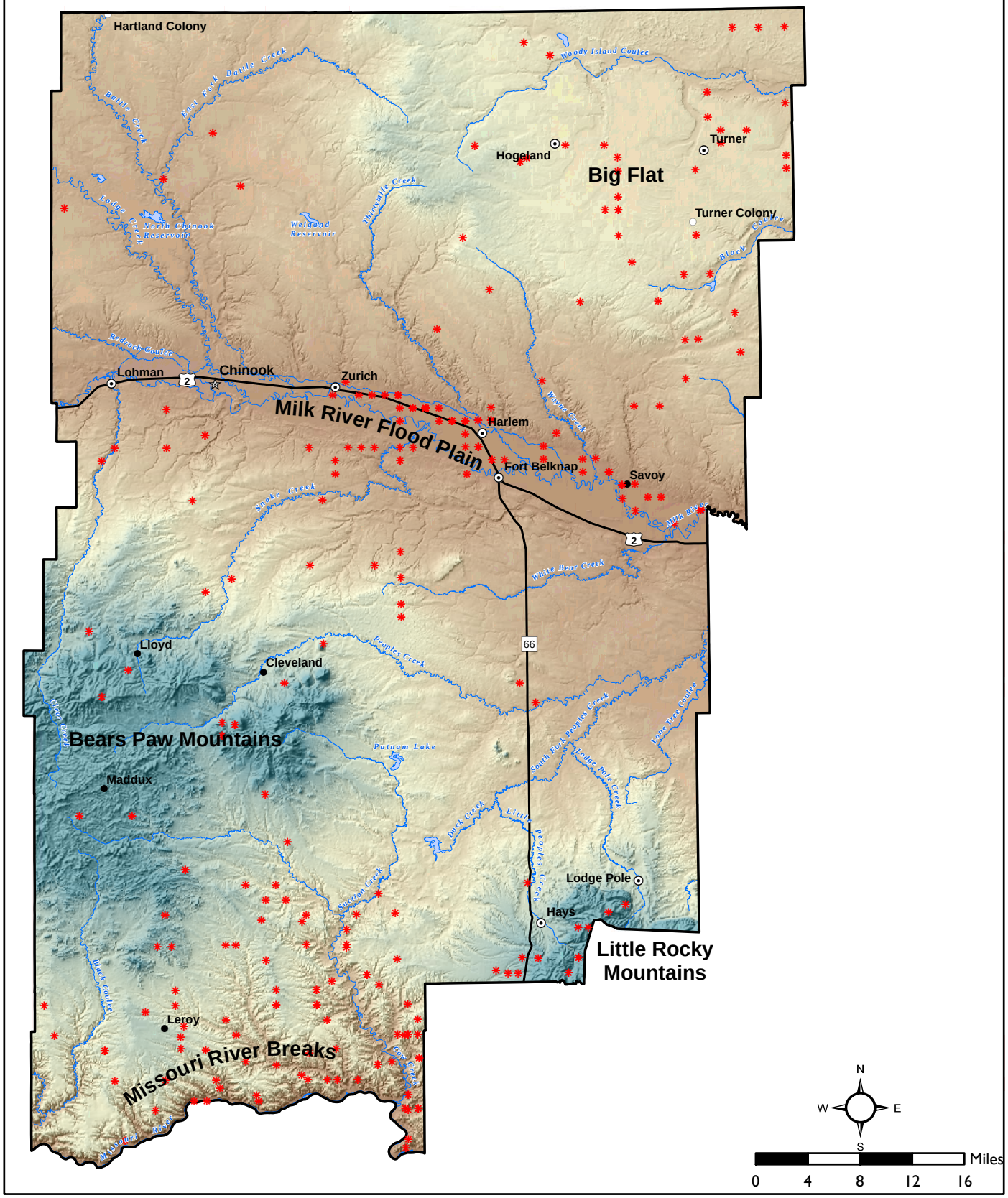
In 2004, 49 percent of fires on a state wide basis were attributed to lightning and 51 percent were determined to be human caused fires. The figure below depicts the percentage of human caused fires in Montana for the period from 1995 to 2004.



(Source: DNRC 2004)

Historical wildfire ignition sources recorded over the last ten years for Blaine County are varied. A history of ignition sources for past fires is presented in Table in *Table 4-11 and Table 4-12* below. The complete listing for historic wildfire occurrences for this region are presented in *Appendix F*. Historical wildfire occurrences are also depicted on ***Map 4-5.***

Blaine County



Elevation (ft)

High : 5989

Low : 2272

* Fire Occurrence

Historical Wildfire Occurrences
Blaine County
Northeast Montana
Community Wildfire Preparedness Plan
Map 4-5

TABLE 4-11
SUMMARY OF COUNTY REPORTED HISTORICAL WILDFIRE CAUSES

Year of Record	Total Number of Fires	Debris Burning	Railroad	Power Line	Equipment Use	Lighting	Smoking	Fireworks	Misc.	Not Noted
1990	10	3	1	1	1	10			1	3
1991	15	6	8			1				
1992	14	5	8						1	
1993	6	1	3						2	
1994	12	2	3		2	3	1		1	
1995	5	1	4							
1996	4	1			1	1		1		
1997	6			1		4			1	
1998	8	3			1	3			1	
1999	5	2		1	1				1	
2000	6	1		1	1	1			2	
2001	9	6	1		1				1	
2002	3					1			2	
2003	10				2	5			3	
2004	6			1	1	3			1	
Totals	119	31	28	5	11	32	1	1	17	3

Source: County and Local Volunteer Fire Departments and Blaine County Officials 2005

TABLE 4-12 --- SUMMARY OF BLM REPORTED HISTORICAL WILDFIRE CAUSES

Year of Record	Total Number of Fires	Debris Burning	Equipment Use	Lighting	Campfire	Misc.	No Description
1980	5		1	3		1	
1981	12	1		9			2
1982	5	1		2			2
1983	9			3		2	4
1984	8			5			
1985	3			3			
1987	2			2			
1988	6			5			1
1989	10			8			2
1990	3			2			1
1991	5			5			
1993	1			1			
1994	6			3			3
1995	1			1			
1996	8			7			1
1997	4			2	1		1
1998	4			4			
1999	7			6			1
2000	5	1		4			
2001	1			1			
2002	1			1			
2003	8			8			
Total	111	3	1	85	1	3	18

Source: BLM 2005

Location and Extent of Previous Wildfire Events:

A description of some wildland fires that have occurred in north-central Montana is presented below.

September-October 1985 – Obrecht Fire. The Turner area experienced a fast moving wildland fire the burned 4,000 acres.

October 16, 1991 – Blaine County Fire of 1991. The Blaine County fire of 1991 burned 187,000 acres or approximately185 sections within 24 hours. The perimeter of the fire was approximately 100 miles. The lighting started fire originally started a few days earlier and hot brush from the fire was dozed into a creek. The pile was not completely extinguished. Wind picked up embers from the dozed pile restarting the fire and the blaze was spread at extremely high rates due to dry conditions and strong winds. The speed of spread and sparse population of the area meant limited people are resources were available to fight the flames. The face of the fire was three miles wide when it entered Blaine County near Ada. The fire, with a several mile front, was headed for Chinook when a wind shift diverted the fire in a southeasterly direction. In almost a straight line from Chinook the fire went towards the Fort Belknap Reservation to approximately the Three Butte area. The fire branched out into fingers approximately five miles across. Part of the fire followed the north edge of the Bears Paw Mountains. People were advised to cut fences to free stock. Fire fighters surrounded the perimeter of the fire and concentrated on the hot spots. A total of 337 homes and businesses were without power for an average of 92 hours. Fourteen transmission line poles and 149 distribution line poles were destroyed. Historic buildings, homesteads, schools and churches were also destroyed. The Ada School, Fairview School, and Fairview Church were some of the notable losses. Pets, horses, poultry, stock and numerous amounts of wildlife were killed during the fire. According to the Blaine County Extension office, losses included 273 cows, 83 sheep, 324 colonies of bees, 18,000 tons of hay, 1,500 tons of straw, 150 buildings (seven occupied homes and five seasonal homes), 35 pieces of machinery and equipment and 900 miles of fences. The total monetary loss was estimated at $7.5 million (Jellum 1994).

May 28, 2000 – Power Plant Fire. Ten acres of private land burned along the southern border of Blaine County as a result of trash burning. BLM assisted to prevent the spread onto BLM land (BLM 2005).

August 30, 2000 – BIA 3. A human caused fire burned 1/8 of an acre on BIA land. An engine from Hays reported to the fire (BLM 2005).

(Phillips County) September 5, 2000 – Camp Creek Fire. Two acres of BLM land located two miles north of Zortman, burned from a naturally caused fire. The fire was extinguished by rain and hail (BLM 2005).

(Phillips County) August 6, 2003 – Beaver Fire. Less than one acre burned on BLM land approximately 3 miles north of Zortman. The fire was controlled by one Light Engine (BLM 2005).

August 6, 2003 – A natural caused fire burned 300 acres of private land. Crews from Zortman and BLM crews from Lewistown responded to the fire (BLM 2005).

August 7, 2003 – A series of lightning storms ignited a number of fires across north-central Montana. In southern Blaine County a wildland fire burned 1,500 acres. Forty miles south of Chinook, lightning ignited pine trees in an area east of the Lloyd Road. The fire spread onto public and private land. No structures were burned. Helicopters and airplanes dropped loads of water and retardant on the fire (*Lightning Storms Spark Fires*, Havre Daily News, August 7, 2003).

(Phillips County) October 19, 2003 – The Plunge Fire. Local Rural and BLM E-65 responded to the fire on private land to prevent the spread of the wildfire onto BLM Land. The human caused fire started approximately 3.5 miles north of DY Junction along side Highway 66 and burned 150 acres (BLM 2005).

July 14, 2004 – Coal Fire. A natural caused fire burned 1,050 acres of BLM land. Ten Light Engines, three Light Airtankers, two Light Dozers, one Medium Airtanker and 8 Type 2 Hand crews responded to the fire.

July 15, 2004 – Fire fighters from the BLM, BIA, USFS, state and private organizations contained a lightening caused fire that burned about 600 acres in southern Blaine County. A BLM employee reported the fire after seeing smoke. Very little private land was involved and mostly BLM land burned (*Lightening Strike Ignites Fire on BLM Land in Blaine County,* Montana Forum, Havre, AP).

4.8 FIRE HAZARD MODELING

The purpose of fire hazard modeling is to identify the locations in the county that are at highest risk to wildfire. This information can then be used to identify community assets that are most at risk, prioritize areas for treatment, and locate areas where interagency planning may be needed to help manage fire risk.

Fire hazard modeling for Blaine County was conducted using GIS based fire modeling software. The outputs from the model are maps of different types of fire risk characteristics that were combined to determine overall risk.

4.8.1 Overview

The fire hazard modeling for Blaine County was conducted using FlamMap2 (Finney et al. 2004). FlamMap2 is a GIS-based fire modeling and analysis program developed and distributed by the Fire Sciences Lab of the Rocky Mountain Research Station located in Missoula, MT. Using topographic data, fuel models, and weather data FlamMap2 calculates rate-of-spread, flame length, heat and other characteristics of fire behavior.

FlamMap2 assesses fuel hazard in terms of fire behavior. It is able to produce maps of surface and crown fire behavior characteristics across a landscape. FlamMap2 is designed to generate outputs that allow comparison of fire behavior across the landscape for a given set of weather and/or fuel moisture data inputs. FlamMap2 uses the same data and core fire modeling algorithms as Far site (Fire Area Simulator).

4.8.2 Model Inputs and Configuration

There are five required and three optional spatial data elements used in FlamMap -

Required Data

- Elevation
- Slope
- Aspect
- Surface Fuel Model
- Canopy Cover

Optional Data

- Stand Height
- Canopy Base Height
- Canopy Bulk Density

Due to lack of adequate data only the required data elements where used for this effort. Elevation, slope and aspect were derived from the USGS National Elevation Dataset (NED) which is raster based digital elevation models with 30 meter pixel resolution. As previously described in section 4.1, the surface fuel model and canopy cover were derived from the USGS National Landcover Dataset (NLCD) which is classified Land sat Thematic Mapped imagery. The NLCD also has 30 meter pixel resolution. The layers were resampled so that they match pixel for pixel and exported to grid ASCII format using the ArcGIS Workstation Grid extension. ASCII grid layers were then imported into a FlamMap2 landscape file. The latitude was set to 48 degrees north.

FlamMap2 weather and wind files were created from Remote Automated Weather Stations (RAWS) data and compiled using the FireFamily Plus program, both provided by the National Interagency Fire Center (NIFC). The RAWS data used for the project area were Rocky Boy's (240601), Fort Belknap (240705), and Zortman Mine (240807). The weather for these stations was grouped using the FireFamily Plus program. The weather file created for use within FlamMap2 described the weather for the Summer of 2003 (June 1 to August 30th). The wind and weather files used in the FlamMap2 analysis are displayed in *Appendix G*.

The FlamMap2 fuel moisture file was also computed using FireFamily Plus. The Fort Belknap RAWS station was used to calculate grassland fuel moistures and Rocky Boy's and Zortman Mine stations were used for upland pine parkland areas. The fuel moisture file used in the analysis is also displayed in *Appendix H*.

FlamMap2 was run using the following parameters. Fuel moistures were set in the fuel moisture file. Winds were set to a wind speed of 15 miles per hour at 270 degrees. Canopy characteristics were set to a height of 12 meters, canopy base height of 1 meter, canopy bulk density of 0.2 kilograms per cubic meter, and foliar moisture content of 100 percent. Fuel moisture was set using fuel moisture conditioning with the weather and wind files. The conditioning period was set to 7/1/2005 at 12:01 AM to 7/31/2005 at 2:00 PM. This fuel drying period represents an exceptionally hot and dry period that is also the fourth year of an extended drought. There were 18 fires reported by BLM during July of 2003 in the Hill, Blaine and Phillips county area, a ten year record. This period was modeled to represent a worst case scenario for planning purposes.

4.8.3 Fire Modeling Results

Flame length was used to model fire hazard for Blaine County and is displayed in ***Map 4-6***. Flame length is a direct output from FlamMap2 and combines Fire Rate of Spread and Heat Per Unit Area. Flame length is used in the wildfire haul charts to quickly determine what strategies are required to fight wildland fires.

Wildfire Haul Categories

- Category 1 - Wildfires with flame lengths of less than 4 feet. These fires have relatively low heat and are slower moving. They can be fought by hand crews digging fireline and directly attacking the fire front. These are the least dangerous fires and have the lowest risk to life and property.

- Category 2 – Wildfires with flame lengths between four and eight feet. These fires are faster moving and hotter. They can be fought by mechanical earthmoving machines and fire engines that are directly attacking the fire front.

- Category 3 – Wildfires with flame lengths between eight and 11 feet. These fires are fast moving and very hot. They are fought by mechanical earthmoving machines and fire engines that are indirectly attacking the fire.

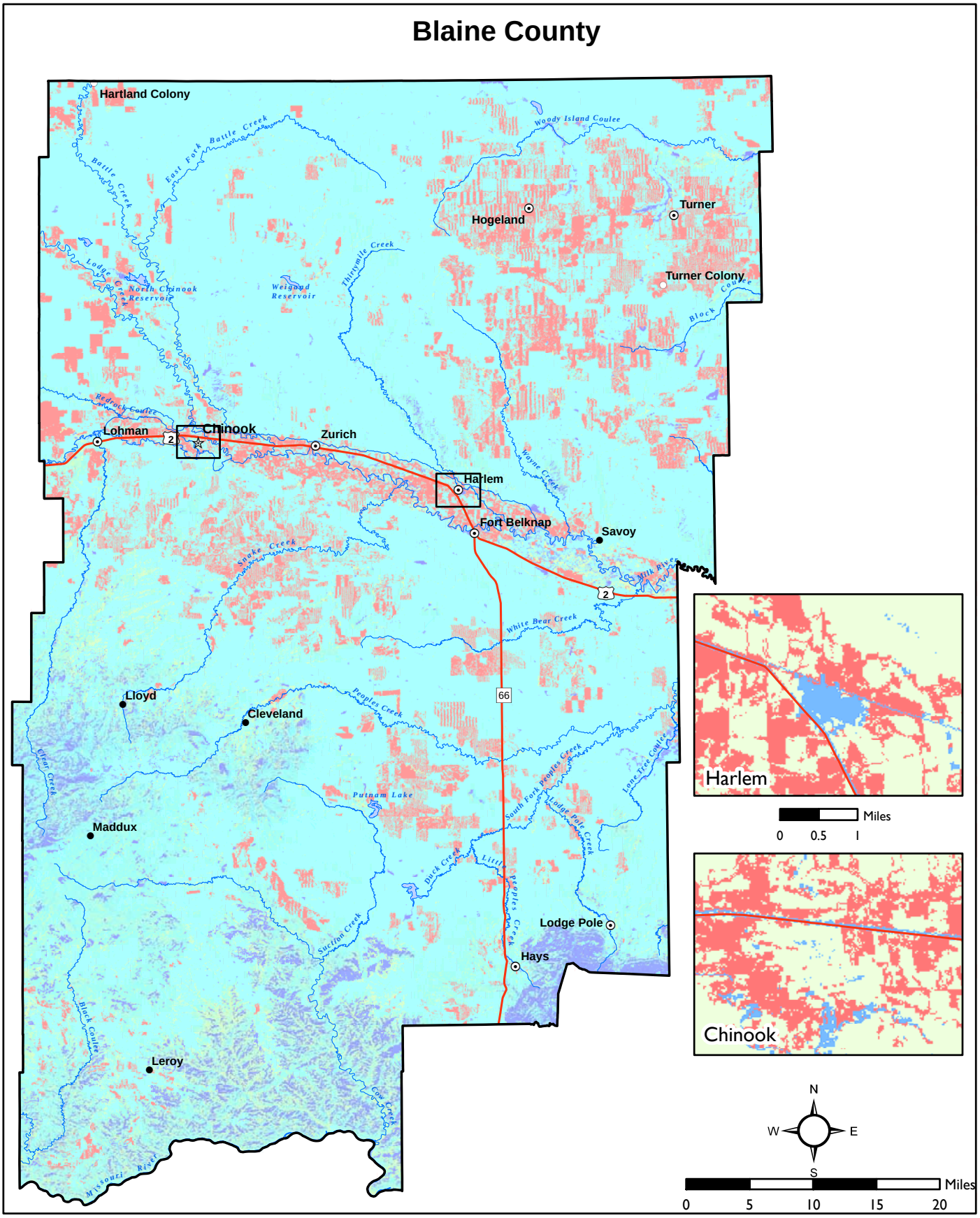
- Category 4 – Wildfires with flame lengths of 11 feet or more. These fires spread very rapidly and are very dangerous. They are difficult to impossible to contain. These fires have the highest risk to life and property.

Flame length is closely tied to fuel type. It is readily noticeable that the Category 4 areas in the county are those associated with small grain farming. This is the result of small grains being categorized as Tall Grass fuel type. This fuel type would only be present during the late summer months, once the grain has cured and before harvest is completed. The high hazard comes into play when the cured crops and harvest crews coincide with dangerous fire conditions, which is normally the case. Once the fields are harvested, stubble fields would no longer be classified as Tall Grass but Short Grass and fire danger would reduce accordingly.

Grassland areas not used for agriculture have reduced fire danger and are Category 2 according to the model. This category makes up most of Blaine County. Given proper conditions, this land category can carry very devastating fires as was demonstrated by the Blaine County fire of October 1991. For the most part, fires in areas of this category are easier to contain than fires in cured grain fields.

Forest and badland areas within the project area contain mostly Category 1 and 2 lands. Forests in these areas are mostly widely spaced parkland. Fires usually stay on the ground and are slow moving with relatively low heat and rarely become crown fires. During drought conditions areas with conifer stands will exhibit Category 3 and 4 behaviors especially during low relative humidity combined with wind.

Blaine County



Flame Length

High : 21

Low : 0

Flame Length
Blaine County
Northeast Montana
Community Wildfire Preparedness Plan
Map 4-6

5.0 ASSESSING VULNERABILITY AND RISK: IDENTIFYING ASSETS, VALUES & VULNERABLE POPULATIONS

Assessing vulnerability requires understanding the location and importance of those things the community values. For purposes of this risk assessment the effects of wildfire on economic, ecological, and social values were assessed.

Where possible, models of the locations and characteristics of community assets were developed so that they could be analyzed relative to the wildfire risk model developed for Blaine County. Specific community resources assessed as valued community resources included building structural values, critical facilities, people, ecological resources, and agricultural stocks.

Assessing wildfire risk was accomplished by evaluating community assets and vulnerabilities in relationship to wildfire extent and severity. To perform the assessment the wildfire severity maps developed in Section 4 of this plan were used to calculate the types and amounts of community assets at risk by fire severity type.

5.1 ASSESSMENT OF ECONOMIC VALUES

An assessment of economic assets within Blaine County was prepared using data available from a variety of sources including the US Census Bureau census block building stock data, the USDA census of agriculture, and the critical facility infrastructure data provided by the County.

5.1.1 Building Values

Analysis of building stock values is based on the building stock data available from the FEMA HAZUS software. Building stock data available in HAZUS was compiled at the census block. *Table 5-1* shows the total building values by fire hazard category. *Table 5-2* shows the Building Stock Values by Fire Hazard by WUI type.

TABLE 5-1
BUILDING STOCK VALUES BY FIRE HAZARD BY LOCATION

	Category 1 Fire Intensity (low)	Category 2 Fire Intensity (low-medium)	Category 3 Fire Intensity (medium-high)	Category 4 Fire Intensity (high)
Blaine County	71,873,000	239,892,000	298,000	42,790,000
Harlem	41,317,000	1,857,000	0	2,328,000
Chinook	2,112,000	79,410,000	0	5,931,000

TABLE 5-2
BUILDING STOCK VALUES (THOUSAND DOLLARS) BY FIRE HAZARD BY WUI TYPE

	Category 1 Fire Intensity (low)	**Category 2 Fire Intensity (low-medium)**	**Category 3 Fire Intensity (medium-high)**	**Category 4 Fire Intensity (high)**
Low Density Intermix	4,3890,000	22,709,000	63,000	361,000
Medium Density Intermix	2,620,000	33,726,000	11,000	253,000
High Density Intermix	1,247,000	57,188,000	0	1,526,000
Wildland Intermix	6,423,000	68,498,000	214,000	9,212,000
Total Intermix Values	14,680,000	182,120,000	288,000	11,352,000
Low Density Interface	626,000	4,436,000	0	2,789,000
Medium Density Interface	33,154,000	7,578,000	0	6,160,000
High Density Interface	19,141,000	1,985,000	0	1,916,000
Total Interface Values	52,922,000	13,993,000	0	10,864,000
Sparsely Inhabited Agricultural	1,185,000	24,124,000	3,000	19,039,000
Wildland with No Vegetation	183,000	1,521,000	0	634,000
Total Sparsely Inhabited Values	1,368,000	25,645,000	3,000	19,673,000
Uninhabited Agricultural	0	1,317,000	0	260,000
Uninhabited with Vegetation	2,749,000	16,890,000	7,000	623,000
Uninhabited with No Vegetation	76,000	6,000	0	16,000
Total Uninhabited Values	2,8245,000	18,213,000	7,000	899,000

5.1.2 Agricultural Stock

Agricultural values were derived from available land ownership and use information and the 2002 census value of county agricultural assets based on data available from USDA. The estimated value of agricultural production in Blaine County for 2002 was $53,295,000 (USDA 2002).

Agricultural lands were derived from the USGS National Land Cover Database (NLCD). NLCD land cover types used to define agricultural areas are Pasture/Hay (81), Row Crops (82), Small Grains (83), and Fallow (84). The economic value of agricultural lands as related to wildfire was determined by taking the total agricultural production for 2002 and dividing it by the total number acres of agricultural lands in the county as defined by the NLCD – $53,295,000/690,677 Acres = $77.16 per acre. *Table 5-3* lists total agricultural areas by fire risk category. *Table 5-4* list Agricultural Values by Fire Hazard by WUI.

TABLE 5-3
AGRICULTURAL VALUE (THOUSAND DOLLARS) BY FIRE HAZARD

	Category 1 Fire Intensity (low)	Category 2 Fire Intensity (low-medium)	Category 3 Fire Intensity (medium-high)	Category 4 Fire Intensity (high)
Blaine County	50	29,152,000	30	24,140,000

TABLE 5-4
AGRICULTURAL VALUE (THOUSAND DOLLARS) BY FIRE HAZARD BY WUI

	Category 1 Fire Intensity (low)	Category 2 Fire Intensity (low-medium)	Category 3 Fire Intensity (medium-high)	Category 4 Fire Intensity (high)
Low Density Intermix	0	10,000	0	3,000
Medium Density Intermix	0	650	0	150
High Density Intermix	0	50	0	280
Wildland Intermix	0	8,926,000	20	7,006,000
Total Intermix Values	0	8,936,000	17	7,009,000
Low Density Interface	0	24,000	0	30,000
Medium Density Interface	0	3,000	0	6,000
High Density Interface	0	280	0	450
Total Interface Values	0	27,000	0	37,000
Sparsely Inhabited Agricultural	0	9,433,000	0	8,921,000
Wildland with No Vegetation	0	5,157,000	0	4,502,000
Total Sparsely Inhabited Values	0	14,590,000	0	13,424,000
Uninhabited Agricultural	0	252, 000	0	146,000
Uninhabited with Vegetation	51	5,454,000	17	3,629,000
Uninhabited with No Vegetation	0	35,000	0	27,000
Total Uninhabited Values	51	5,742,000	17	3,802,000

5.1.3 Critical Facilities, Resources and Infrastructure

Critical facilities are of particular concern because they provide, or are used to provide, essential products and services that are necessary to preserve the welfare and quality of life and fulfill important public safety, emergency response, and/or disaster recovery functions.

Critical facilities are defined as facilities critical to government response and recovery activities (i.e., life safety and property and environmental protection). Critical facilities include: 911 emergency call centers, emergency operations centers, police and fire stations, public works facilities, sewer and water facilities, hospitals, bridges and roads, and shelters; and facilities that, if damaged, could cause serious secondary impacts (i.e., hazardous material facility, compressor stations, substations). Critical facilities also include those facilities that are vital to the continued delivery of community services or have large vulnerable populations. These facilities may include: buildings such as jails, law enforcement centers, public services buildings, courthouses, juvenile services buildings and other public facilities such as hospitals, nursing homes and schools. *Appendix I* lists critical facilities in Blaine County.

Critical facilities data was gathered by obtaining lists from DES county officials and then reviewing, correcting, and enhancing them during public meetings. Accurate location information was not available for many of the critical facilities listed in *Appendix I*. Only those facilities that could be located accurately were included in the analysis. *Table 5-5* lists number of critical facilities by fire risk.

TABLE 5-5
NUMBER OF CRITICAL FACILITIES BY FIRE HAZARD BY LOCATION

	Category 1 Fire Intensity (low)	Category 2 Fire Intensity (low-medium)	Category 3 Fire Intensity (medium-high)	Category 4 Fire Intensity (high)
Blaine County	41	45	1	9
Harlem	18	2	0	1
Chinook	2	31	0	4
Harlem and Chinook included in the County total.				

TABLE 5-6
NUMBER OF CRITICAL FACILITIES BY FIRE HAZARD BY WUI

	Category 1 Fire Intensity (low)	Category 2 Fire Intensity (low-medium)	Category 3 Fire Intensity (medium-high)	Category 4 Fire Intensity (high)
Low Density Intermix	8	1	0	0
Medium Density Intermix	1	14	0	0
High Density Intermix	0	11	0	0
Wildland Intermix	2	9	1	1
Total Intermix Values	11	35	1	1
Low Density Interface	0	1	0	0
Medium Density Interface	18	1	0	3
High Density Interface	4	0	0	0
Total Interface Values	22	2	0	3
Sparsely Inhabited Agricultural	0	3	0	4
Wildland with No Vegetation	0	0	0	0
Total Sparsely Inhabited Values	0	3	0	4
Uninhabited Agricultural	0	0	0	1
Uninhabited with Vegetation	1	5	0	0
Uninhabited with No Vegetation	7	0	0	0
Total Uninhabited Values	8	5	0	1

5.2 ASSESSMENT OF ECOLOGICAL VALUES

An assessment of ecological values within Blaine County was prepared using data available from a variety of sources including Montana Department of Environmental Quality (MDEQ), US Geological Service (USGS, and Montana Fish Wildlife and Parks (MFWP). The ecological effects of fire to wildlife and water resources were evaluated quantitatively. Other impacts to notable ecological resources are discussed.

Wildfires are a naturally occurring component of functioning ecosystems. Wildfires are common in forests and grasslands in the western United States where large, continuous areas exist in arid and semi-arid conditions Wildfire is considered a type of disturbance that is not inherently positive or negative. Disturbance is defined as an event that abruptly kills, displaces, or damages one or more individual plants or animals, thereby creating an opportunity for new individuals to establish (Sousa 1984).

The immediate effects of fire include burning of vegetation, wood debris and soil organic matter. Wildfire can also kill animals unable to escape flames, heat, and smoke. Wildfires ecological effects are highly dependent on the amount of change in the overall composition of vegetative communities. Many species that have evolved in fire dependent ecosystems show positive responses to wildfire. Fire exclusion, agricultural practices, and invasion of weedy species since European settlement have changed vegetation and fuels and have increased the chances of fires that burn hotter or over larger areas than historical wildland fires and have more negative effects. Negative effects of fire can include changes in soil productivity and absorption capacity which in turn affects vegetation development and erosion. Wildfire can affect the health of streams and watersheds due to increased erosion and increased water temperature due to removal of shade.

When advisable, Minimum Impact Suppression Tactics (MIST) as opposed to aggressive suppression actions could be implemented in sensitive habitats, riparian zones, road-less and wilderness areas to prevent ecosystem degradation. Prescribed fire treatments as opposed to mechanical treatments provide a more ecologically sound method for fuels reduction as mechanical treatments potentially cause adverse environmental impacts such as soil compaction, sedimentation into watersheds and streams and the spread of invasive weed species (Western Fire Ecology Center 2005).

5.2.1 Wildlife Habitat

Table 5-7 documents wildlife habitat acres by species and fire risk zone.

TABLE 5-7
ACRES OF WILDLIFE HABITAT BY SPECIES FOR BLAINE COUNTY

	Category 1 Fire Intensity (low)	Category 2 Fire Intensity (low-medium)	Category 3 Fire Intensity (medium-high)	Category 4 Fire Intensity (high)
Antelope-general	96,897	2,033,829	6,854	300,358
Antelope-winter	3,364	133,542	157	12,369
Bighorn Sheep-general	28,175	83,037	5,309	2,246
Elk-summer	51,748	169,236	5,519	2,723
Elk-winter	30,214	71,380	4,865	767
Mule Deer-year round	116,620	1,814,894	10,558	268,504
Mule Deer-year round/winter	841	77	0	1
Whitetail Deer-general	56,060	1,358,815	2,882	221,861
Blue Grouse	39,057	135,094	10,023	2,353
Hungarian Partridge	133,568	2,127,039	10,354	311,403
Pheasant-good	8,039	169,106	240	50,048
Pheasant-fair	1,867	53,224	41	5,936
Sage Grouse-year round	72,124	1,535,430	1,845,682	233,180
Sage Grouse-year round/nesting and brooding	4,085	311,720	355,952	40,041
Sharp-tailed Grouse	136,306	2,065,625	10,875	268,150
Wild Turkey	249	3,822	0	4,328

Source: MFWP 2005

5.2.2 Watersheds and Streams

TABLE 5-8
ACRES OF FOURTH CODE WATERSHED FOR BLAINE COUNTY

	Category 1 Fire Intensity (low)	**Category 2 Fire Intensity (low-medium)**	**Category 3 Fire Intensity (medium-high)**	**Category 4 Fire Intensity (high)**
Battle	2,499	275,335	37	18,175
Beaver	2,970	20,716	20	116
Bullwhacker-Dog	34,507	211,772	5,824	7,270
Cottonwood	5,115	263,121	53	83,201
Fort Peck Reservoir	37,236	268,945	3,125	10,418
Lodge	456	50,990	30	11,430
Middle Milk	35,194	826,510	1,115	148,940
Peoples	28,426	318,911	790	31,998
Whitewater	56	4,058	0	1,252
Source: NRIS 2005				

TABLE 5-9
MILES OF STREAM FOR BLAINE COUNTY

	Category 1 Fire Intensity (low)	Category 2 Fire Intensity (low-medium)	Category 3 Fire Intensity (medium-high)	Category 4 Fire Intensity (high)
Battle Creek	4.66	60.01	0.21	5.27
Big Warm Creek	0.28	5.40	0.00	0.00
Birch Creek	0.23	9.19	0.32	0.00
Black Coulee	0.66	31.37	0.66	0.01
Block Coulee	0.77	3.17	0.00	2.57
Clear Creek	8.31	43.38	0.35	0.02
Cow Creek	3.82	58.89	0.64	1.00
Dodson Creek	0.00	4.92	0.00	2.23
Duck Creek	0.00	10.06	0.00	0.23
East Fork Battle Creek	0.04	43.78	0.04	0.00
Fort Belknap Canal	2.00	25.78	0.00	16.74
Little Peoples Creek	3.53	18.29	0.05	1.63
Lodge Creek	1.97	40.95	0.33	7.89
Lodge Pole Creek	4.56	25.07	0.30	1.19
Lone Tree Coulee	5.85	19.89	0.09	0.15
Milk River	58.82	31.77	0.00	29.82
Missouri River	18.64	23.20	0.84	0.15
North Branch White Bear Creek	0.05	13.99	0.00	0.78
Peoples Creek	5.91	83.52	0.51	3.26
Redrock Coulee	0.50	13.69	0.00	7.34
Snake Creek	3.62	55.68	0.28	6.03
South Fork Peoples Creek	1.56	29.73	0.17	0.53
Suction Creek	1.12	36.82	0.08	0.06
Thirtymile Creek	1.34	43.54	0.08	5.28
Wayne Creek	0.53	31.25	0.25	1.70
West Fork Black Coulee	0.34	13.49	0.09	0.34
White Bear Creek	0.35	31.59	0.06	0.30
Woody Island Coulee	8.28	33.58	0.01	1.92
Totals	137.74	842	5.36	94.52
Source: NRIS 2005				

Upper Missouri River Breaks National Monument was established by Presidential Proclamation in January of 2001. The Upper Missouri River Breaks National Monument encompasses all of the Wild & Scenic Missouri River. The Wild and Scenic Rivers Act protects free-flowing rivers with outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values. The Upper Missouri River the flows along the southern border of Blaine County is included in the Act. The Upper Missouri River is managed by the BLM. Forty-nine different species of fish reside in the Missouri River including a few 140 pound paddlefish. More common fish species include goldeye, carp, and northern pike. Residing along the shoreline soft-shelled turtles, beavers and a variety of waterfowl. Riparian zones of the river include 60 species of mammals and 233 species of birds (NLCS 2004).

5.3 ASSESSMENT OF SOCIAL VALUES

A significant wildfire impact is the effect it has on people. The severity of the impact is related to the population affected and the population's ability to protect itself. To determine the number of persons potentially affected and to model the ability to self-protect and recover from hazards demographic information including age and indicators of economic well being were used to develop a population vulnerability model. The data used to develop the vulnerability model was derived from the 2000 Census. To model overall vulnerability the following equation was used:

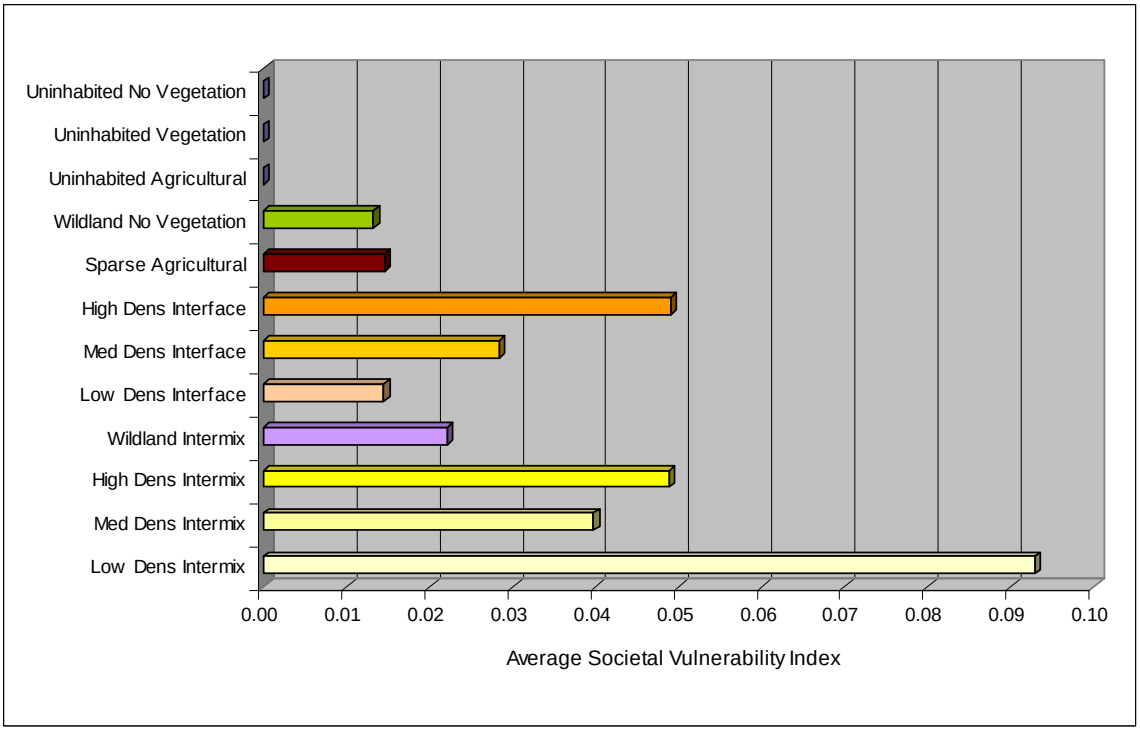
- Vulnerability Score = (societal variable for the census block / total societal variable in jurisdiction) / maximum societal variable for any census block in the jurisdiction)

This formula creates a score for each variable that is based on the percentage of that variable in the jurisdiction and is normalized to a scale that is the same as the other variables. The societal variables that were used to determine the overall societal vulnerability per census block were:

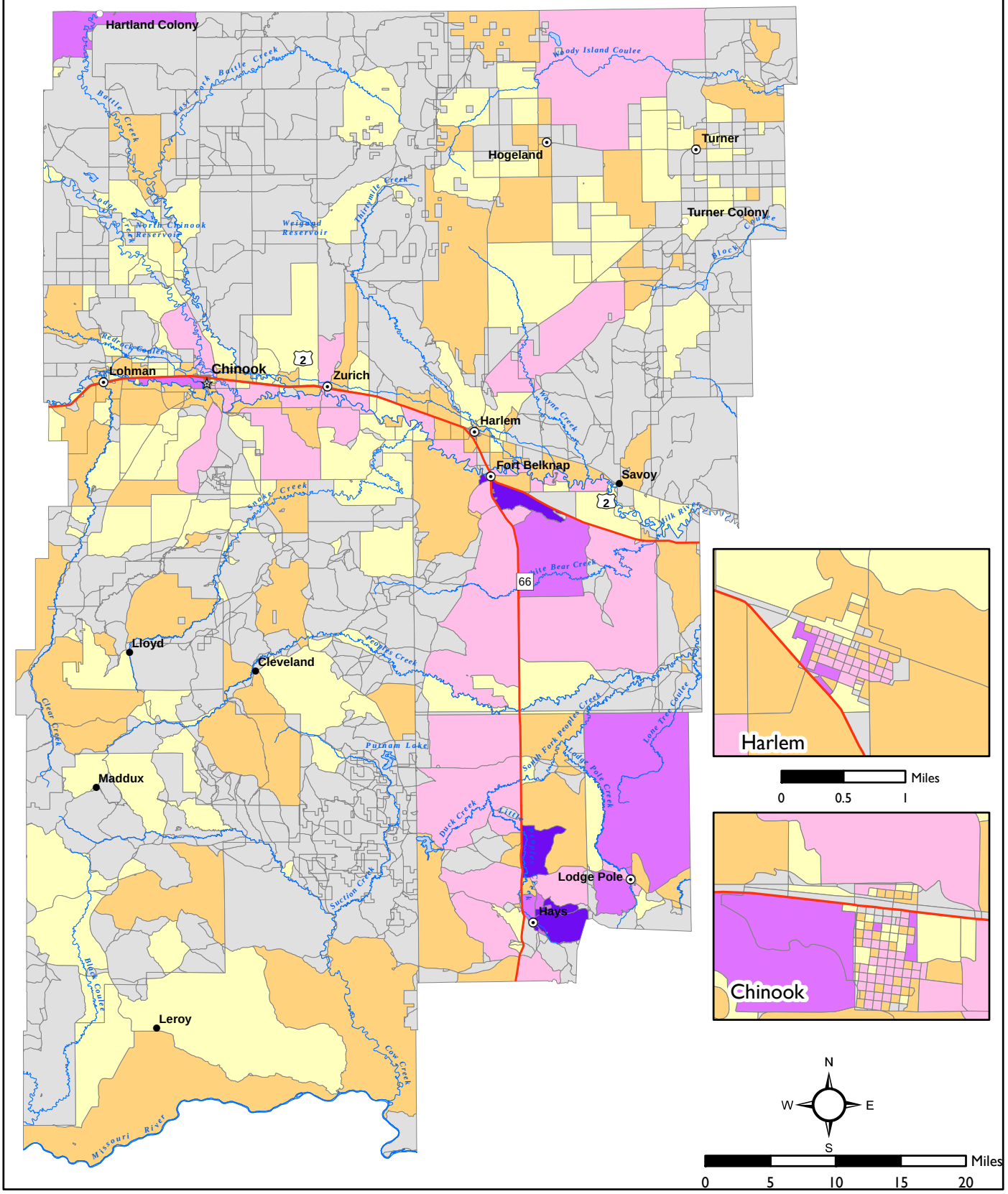
- Population Density
- Age > 65
- Age < 18
- Income < Poverty Level
- No High School Diploma
- Population with Disabilities
- Population on Public Assistance

Each block was assigned a score for each societal vulnerability and an overall societal vulnerability by adding the individual societal vulnerability scores and dividing by seven, which is the total number of variables evaluated. ***Map 5-1*** **d**epicts total societal vulnerability by census block.

Average Societal Vulnerability by Wildland/Urban Interface is depicted in the bar chart below:



Blaine County



Societal Vulnerability Score

0.000	0.010 - 0.035	0.085- 0.205
0.000 - 0.010	0.035 - 0.085	0.205 - 1.000

Societal Vulnerability by Census Block
Blaine County
Northeast Montana
Community Wildfire Preparedness Plan
Map 5-1

6.0 MITIGATION STRATEGY

Specific mitigation goals and projects were developed for Blaine County in conjunction with public meetings held in three communities and stakeholder interviews. A matrix developed for project ranking emphasizing cost-benefit and input from local officials was used to determine project prioritization. Following is a description of goals and objectives used to mitigate human and natural caused wildfire hazards that builds on the community's existing capabilities. Project implementation and legal framework are discussed at the conclusion of this section.

6.1 EXISTING SITUATION

Between 1980 and 2004 approximately 230 wildfire events were documented in Blaine County. Further information on these wildfire events is presented in subsequent sections of this Plan.

Three public meetings were held in the communities of Harlem and Chinook. Additionally, meetings and interviews were held with public officials numerous times during development of the plan. Generally, Blaine County residents identified recent drought conditions and fire suppression assets are their primary obstacles in minimizing the risk of wildfire hazards.

Wildfire hazard prioritization was accomplished by determining which wildfire causes had caused any prior fatalities; resulted in property damage; had the potential to cause the most economic hardship within the County; and had the potential to affect Blaine County residents in the future. Based on review of the historical record and local knowledge, Blaine County identified four major wildfire ignition hazards that consistently affect this geographic area – debris burning, lightning, railroad and equipment use.

6.2 MITIGATION OBJECTIVES AND ACTIONS

6.2.1 Hazard Mitigation Goals

The Plan goals describe the overall direction that Blaine County agencies, organizations, and citizens can take to work toward mitigating risk from wildfire hazards. Goals and objectives of the Plan were developed during interviews and meetings with public officials and at the public meetings held in Chinook and Harlem. The broad range of potential wildfire mitigation activities were considered, and below is a list of mitigation objectives and the actions (projects) identified by the County. Although these projects may not be eligible for FEMA or HFRA grant funding, Counties may secure alternate funding sources to implement these projects in the future. Mitigation projects specific to individual jurisdictions are noted within the list.

Enhance Early Warning Capabilities

- Obtain or update sirens in all communities.
- Obtain bullhorns or loud speakers to broadcast emergencies locally.
- Launch public awareness campaign so residents understand what hazards are present when sirens are used.
- Develop warning system for train derailments involving hazardous materials (Chinook, Harlem, Zurich, Savoy, Lohman).

Enhance Communication Systems

- Obtain satellite phones to enhance communication in southern part of County.
- Improve communication amongst volunteer fire fighters.
- Coordinate radio/repeater sites to enhance communication system.
- Map areas within County that do not have communications, and provide human or temporary repeater for incidents in these areas. Coordinate with cooperators for emergency use of Federal or State Repeater systems and frequencies.

Minimize Risk of Wildfire at Urban Interface

- Reduce number of abandoned wood buildings in towns.

Enhance Emergency Shelter Facilities

- Define emergency shelters in each community.
- Obtain emergency generator for Little Rockies Senior Center.
- Obtain mobile generators for emergency shelters.
- Equip both schools in Harlem with pig-tails for emergency generators.
- Obtain emergency generator for all schools in Blaine County.
- Install two-way switches in facilities where emergency generators are used.
- Install pigtails at shelters to accommodate mobile generators.

Maintain Integrity of Water Supply

- Assist with reconstruction of St. Mary's water pipeline that supplies Milk River.

Improve Fire Fighting Capabilities

- Develop GPS database of water sources in County to enhance fire fighting efforts.
- Identify site(s) and develop water storage facilities for towns of Turner and Hogeland.
- Obtain larger fire response vehicles to accommodate mobile generators.
- With cooperators, provide classroom or video fire suppression training for rural area citizens and County employees who will respond to wildfland fires (DNRC, BLM).
- Identify appropriate locations for the installation of dry hydrants to provide water for fire fighting.
- Develop new water supplies in rural areas for fire fighting.
- Obtain a temporary water bladder(s) of 5,000 to 10,000 gallons for Turner and Hogeland until permanent water storage facilities are constructed.
- Implement fuel reduction measures along highways, communication sites, around perimeter and within communities by cutting or mowing where feasible.
- Utilize County and cooperators expertise to meet training needs. Provide incentive for fire fighters to attend training. Practice until proficient with County GPS units and cooperators communications systems.
- Obtain mobile generators for response vehicles to pump water from hydrants and/or seasonal bladders
- Coordinate with State Regional DES and Federal partners for scheduling and attendance at Incident Command System (ICS) 100/200 and/or IS 700 or State of Montana DES training requirement (DES, DNRC).

- Develop Type III Incident Management Team table of organization utilizing expertise within the county and adjacent counties within the MT State DES Region. Utilize the National Incident Management System (NIMS) as structure to identify Incident Commander(s), Safety, Information and Liaison Officers, and Operations, Planning, Logistics, Finance Section Chiefs. All Risk and Wildland Fire Type III teams may require separate specialists in operations, plans and logistics (DES, DNRC).
- Develop a County Wildfire-Emergency and All Risk Operations Plan, including a County/Interagency communications plan with cooperators and communities (DES, DNRC, BLM, Fort Belknap).
- Utilize and enforce Blaine County Burning Permit. Examine adjacent County's Burning Permits and standardize requirements.
- Coordinate with cooperators to employ fuel reduction treatments on or around CRP lands such as double row plow/disk perimeters, mow vegetation, introduce prescribed fire or combination.
- Reduce number of railroad ignitions by coordination with BNSF railroad welding crews. Request railroad right-of-way fuel reduction mowing/spraying and removal.

Reduce Wildfire Hazard

- Implement FIREWISE practices through creation of defensible space around communities and private homes. Utilize standard Fire Protection Guidelines for Residential Development in the Wildland/Urban Interface as identified in NFPA 1144 Standard for Protection of Life and Property.
- Coordinate with cooperators to employ fuel reduction treatments on CRP and other lands with high or undesirable fuels. Treatments such as double row plow/disk perimeter, mowing vegetation, introduce prescribed fire, other mechanical treatments or a combination (BLM, DNRC).
- Continue grazing in sustainable areas by wild and domestic ungulates to reduce fuel loadings and lower potential wildfire intensity.

Enhance Emergency Response Capabilities

- Obtain GPS units and provide training for fire departments.
- Reconstruct the Thirtymile Creek crossing to ensure north/south access for emergency services.
- Construct dam on Thirtymile Creek to ensure north/south access is maintained in northern portion of County (Turner, Hogeland).
- Conduct study to determine best way to address access issues associated with Thirtymile Creek crossing (Turner Hogeland).
- Construct alternate railroad crossing near Harlem and Zurich for times when BNSF trains block tracks (Harlem, Turner, Hogeland, Zurich).

Enhance Hazmat Response Capabilities

- Provide Haz-Mat training to fire departments.
- Obtain SCBA units for Chinook fire department (Chinook).

Enhance Hazardous Material Awareness

- Provide awareness training to county residents on how to respond to train derailments involving hazardous materials.

6.2.2 Prescribed Fires

Prescribed fire treatments for fuels reductions are generally ecologically and economically sound methods for fuels reductions. Fuels targeted are small-diameter dead surface fuels and understory vegetation such as grass, brush, saplings, and pole-sized trees. Areas targeted for fuels management projects include sites with potential for uncontrollable disaster fires and sites where the ecosystem could be improved through fire use. Fuel treatments are costly and average $250 to $2,200 an acre. Funds are awarded through the NFP for hazardous fuels treatment on private land, but require cost share from landowners (DNRC 2005). In its effort to enhance entire ecosystems, the BLM continues to work closely with other federal, state and local agencies, including rural fire departments, and the public throughout the planning and implementation. *Table 6-1* illustrates BLM prescribed fire statistics over a three year period.

TABLE 6-1
BLM PRESCRIBED FIRE STATISTICS
STATE OF MONTANA

Year	Number of Projects	Acreage by Benefiting Program								
		Forestry	Range	Wildlife	Hazard Reduction	Watershed	Ecosystem Health	Other	Not Specified	Total
2001	11		640	580	2820		3,671	700		8,411
2000	9	93		819	1856		875	52		3,695
1999	22	50	600	980	8,548	50	556	32		18,816

Proposed BLM fire treatments in Blaine County are described as follows:

- The Lion Coulee Prescribed Fire is scheduled for fall of 2005 or the Spring of 2006. A proposed burn of approximately 750 acres will reduce hazardous fuels created from a local blow-down event. The location of the burn is 47.8785 Latitude and -109.2871 Longitude.

6.2.3 Grants

The DNRC has federal funds available on an annual basis through the Volunteer Fire Assistance (VFA) Program. VFA, Title IV, is a federal matching funds program with dollars provided by the USDA Forest Service. Title II/IV authorizes the Secretary of Agriculture to provide funds and technical assistance to DNRC to organize, train and equip local forces for preventing and suppressing wildfires. Requirements for the grant include that the financial assistance on a project can exceed 50 percent of the total project cost and only communities with a population less than 10,000 can partake in the application process. The projects covered by the funds include the following.

Fire Protection Organization and Planning
- Formation of Rural and Volunteer Fire Districts
- Fire Plans

Fire Training
- Structural fire protection
- Wildland fire protection

Fire Equipment
- Communications systems
- Conversion of Excess Military Property
- New equipment purchases

Fire Prevention

- Signs, posters, and educational materials
- Smoke detectors, tools, and equipment
- Prevention projects

Wildland Personal Protective Equipment (PPE)

- Construction or improvement of fire stations for housing fire equipment, normal operational expenses, and maintenance expenses cannot qualify for Volunteer Fire Assistance funds.

As a result of the National Fire Plan, the Volunteer and Rural Fire Assistance (VFA/RFA) Program provides assistance to county fire agencies for equipment, training, and fire prevention materials. In 2003, the Department of the Interior agencies (BLM, FWS & BLM) contributed their budgeted Rural Fire Assistance (RFA) Program dollars to be combined with the Volunteer Fire Assistance (VFA) funds granted by the USDA Forest Service. The total assistance available in Montana exceeded $1.1 million in 2004. The DNRC and its partners were recognized with the Ben Franklin Award, given by the Forest Service annually to one state for excellence in delivering these programs. Blaine County received $33,889 dollars in VFA/RFA between 2001 and 2003 (DNRC 2005).

The main goal of the DNRC's Community Protection Fuels Mitigation Grant Program is to protect communities and subdivisions from fires that cross onto private property from adjacent federal property. Assistance is provided to private landowners to reduce fuel hazards. Funding for the program is made possible through the USDA Forest Service as part of the National Fire Plan. Ideal projects are those which treat multiple ownerships and/or contiguous acreage, promoting equal landscape treatment. Past grant recipients include communities, homeowner associations, local governments, and fire departments. Resource Conservation & Development Areas (RC&Ds) can also apply on behalf of individual homeowners, subdivisions, or communities.

The Assistance to Firefighters Grant (AFG) of 2005 is a program provided by the Office for Domestic Preparedness of the U.S. Department of Homeland Security in cooperation with the U.S. Fire Administration. The program is designed to assist local fire departments in protecting citizens and firefighters against the effects of fire and fire-related incidents (Homeland Security 2005).

6.3 PROJECT RANKING AND PRIORITIZATION

A cost-benefit matrix was developed to rank the mitigation projects using the following criteria. Each project was assigned a "high", "medium", or "low" rank for *Population Impacted, Property Impacted*, and *Cost*. For the *Population Impacted* category, a "high" rank represents greater than 50 percent of County residents; a "medium" rank represents 20 to 50 percent of County residents; and a "low" rank represents less than 20 percent of County residents. For the *Property Impacted* and *Project Cost* categories, a "high" rank represents greater than $500,000, a "medium" rank represents between $100,000 and $500,000, and a "low" rank is less than $100,000. The matrix was completed by assigning each rank a numeric value as follows:

TABLE 6-2
COST-BENEFIT SCORING MATRIX

	Population Impacted	**Property Impacted**	**Cost**
High	5	5	1
Medium	3	3	3
Low	1	1	5

The overall cost-benefit was then calculated by summing the total score for each project. *Table 6-3* presents the Hazard Mitigation Project Cost-Benefit Matrix for Blaine County. Projects identified by Blaine County as top priorities based on cost/benefit ranking are presented in *Table 6-4*.

TABLE 6-3
CWPP MITIGATION PROJECT COST BENEFIT MATRIX

GOAL	HAZARD MITIGATION PROJECTS	HAZARDS MITIGATED	JURISDICTION	POPULATION IMPACTED	PROPERTY IMPACTED	COST	COST/BENEFIT RANKING
Enhance Early Warning Capabilities	Launch public awareness campaign so residents understand what hazards are present when sirens are used.	Fire, Flooding, Tornadoes	Blaine County	High	High	Low	High
Enhance Early Warning Capabilities	Develop warning system for train derailments involving hazardous materials.	Technological	Chinook, Harlem, Zurich, Savoy, Lohman	High	High	Low	High
Improve Fire Fighting Capabilities	Identify appropriate locations for the installation of dry hydrants to provide water for fire fighting.	Fire	Blaine County	High	High	Medium	High
Improve Fire Fighting Capabilities	Develop new water supplies in rural areas for fire fighting.	Fire	Blaine County	High	Medium	Medium	High
Improve Fire Fighting Capabilities	Obtain mobile generators for response vehicles to pump water from hydrants and/or bladders.	Fire	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	Coordinate with State Regional DES and Federal partners for scheduling and attendance at Incident Command System (ICS) 100/200 and/or IS 700 or State of Montana DES training requirement.	Fire	Blaine County/DES/DNRC	High	High	Low	High
Improve Fire Fighting Capabilities	Develop Type III Incident Management Team table of organization utilizing expertise within the county and adjacent counties within the MT State DES Region. Utilize the National Incident Management System (NIMS) as structure to identify Incident Commander(s), Safety, Information and Liaison Officers, and Operations, Planning, Logistics, Finance Section Chiefs. All Risk and Wildland Fire Type III teams may require separate specialists in operations, plans and logistics.	Fire	Blaine County/DES/DNRC	High	High	Low	High
Improve Fire Fighting Capabilities	Develop a County Wildfire-Emergency and All Risk Operations Plan, including a County/Interagency communications plan with cooperators and communities.	Fire	Blaine County/DNRC/DES/BLM/Fort Belknap	High	High	Low	High
Reduce Wildfire Hazards	Continue grazing in sustainable areas by wild and domestic ungulates to reduce fuel loading and lower potential wildfire intensity	Fire	Blaine	High	High	Low	High
Reduce Wildfire Hazards	Implement Firewise practices through creation of defensible space around communities and private homes. Utilize standard Fire Protection Guidelines for Residential Development in the Wildland/Urban Interface as identified in NFPA 1144 Standard for Protection of Life and Property from Wildfire (2002). Participate in the National Firewise Communities program.	Fire	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	Utilize and enforce Blaine County Burning Permit. Examine adjacent Counties Burning Permits and standardize requirements.	Fire	Blaine County	High	High	Low	High
Reduce Wildfire Hazards	Coordinate with cooperators to employ fuel reduction treatments on CRP and other lands with high or undesirable fuels. Treatments such as double row plow/disk perimeter, mowing vegetation, introduce prescribed fire, other mechanical treatments or a combination.	Fire	Blaine County/BLM/DNRC	High	High	Low	High
Improve Fire Fighting Capabilities	Reduce number of railroad ignitions by coordination with BNSF railroad welding crews. Request railroad right-of-way fuel reduction mowing/spraying and removal.	Fire	Blaine County	High	High	Low	High
Enhance Emergency Response Capabilities	Obtain GPS units and provide training for fire departments	Fire	Blaine County	High	High	Low	High
Enhance Emergency Response Capabilities	Construct dam on Thirtymile Creek to ensure north/south access is maintained in northern portion of County.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Turner, Hogeland	Low	High	High	High
Enhance Haz-Mat Response Capabilities	Provide Haz-Mat training to fire departments.	Fire, Technological	Blaine County	High	High	Low	High
Enhance Communication Systems	Improve communication amongst volunteer fire fighters.	Fire	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	Obtain larger fire response vehicles to accommodate mobile generators.	Fire	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	Develop GPS database of water sources in County to enhance fire fighting efforts.	Fire	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	Utilize County and cooperators expertise to meet training needs. Provide incentive for fire fighters to attend training. Practice until proficient with County GPS units and cooperators communications systems.	Fire	Blaine County	High	High	Low	High
Enhance Emergency Response Capabilities	Conduct study to determine best way to address access issues associated with Thirtymile Creek crossing.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Blaine County	Medium	High	Medium	High
Enhance Early Warning Capabilities	Obtain bullhorns or loud speakers to broadcast emergencies locally.	Fire, Flooding, Tornadoes	Blaine County	High	High	Low	High
Enhance Communication Systems	Coordinate radio/repeater sites to enhance communication system.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	With cooperators, provide classroom or video fire suppression training for rural area citizens and County employees who will response to wildland fires.	Fire	DNRC/Blaine County/BLM	High	High	Low	High
Improve Fire Fighting Capabilities	Implement fuel reduction measures along highways, communication sites, around perimeter and within communities by cutting or mowing where feasible.	Fire	Blaine County	High	High	Low	High

TABLE 6-3
CWPP MITIGATION PROJECT COST BENEFIT MATRIX

GOAL	HAZARD MITIGATION PROJECTS	HAZARDS MITIGATED	JURISDICTION	POPULATION IMPACTED	PROPERTY IMPACTED	COST	COST/BENEFIT RANKING
Enhance Early Warning Capabilities	Obtain or update sirens in all communities.	Fire, Flooding, Tornadoes, Haz-Mat, Winter Storms	Blaine County	High	High	Medium	High
Maintain Integrity of Water Supply	Assist with reconstruction of St. Mary's water pipeline that supplies Milk River.	Technological	Blaine County	High	High	High	High
Enhance Early Warning Capabilities	Obtain siren for Dry Fork Dam	Flooding, Technological	Blaine County	Medium	Medium	Low	Medium
Enhance Communication Systems	Obtain satellite phones to enhance communication in southern part of County.	Fire, Flooding, Tornadoes, Winter Storms	Southern Blaine County	Medium	High	Medium	Medium
Improve Fire Fighting Capabilities	Identify site(s) and develop water storage facilities for towns of Turner and Hogeland.	Fire	Turner, Hogeland	Low	Medium	High	Medium
Enhance Emergency Response Capabilities	Construct alternate railroad crossing near Harlem and Zurich for times when BNSF trains block tracks.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Harlem, Turner, Hogeland, Zurich	Medium	Medium	Medium	Medium
Enhance Emergency Shelter Facilities	Define emergency shelters in each community.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Blaine County	High	Low	Low	Medium
Enhance Emergency Shelter Facilities	Install two-way switches in facilities where emergency generators are used.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Blaine County	High	Low	Low	Medium
Enhance Emergency Shelter Facilities	Install pigtails at shelters to accommodate mobile generators.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Blaine County	High	Low	Low	Medium
Enhance Hazardous Material Awareness	Provide awareness training to county residents on how to respond to train derailments involving hazardous materials.	Technological	Blaine County	High	Medium	Low	Medium
Enhance Emergency Shelter Facilities	Obtain mobile generators for emergency shelters.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Blaine County	High	Low	Low	Medium
Minimize Risk of Wildfire at Urban Interface	Reduce number of abandoned wood buildings in towns.	Fire	Blaine County	Low	Low	Low	Low
Improve Fire Fighting Capabilities	Obtain a temporary water bladder(s) of 5,000 to 10,000 gallons for Turner and Hogeland until permanent water storage facilities are constructed.	Fire	Turner, Hogeland	Low	Medium	Low	Low
Enhance Emergency Response Capabilities	Reconstruct the Thirtymile Creek crossing to ensure north/south access for emergency services.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Turner, Hogeland, Chinook, Zurich, Harlem	Low	Low	Medium	Low
Enhance Emergency Shelter Facilities	Obtain emergency generator for Little Rockies Senior Center.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Harlem	Low	Low	Low	Low
Enhance Emergency Shelter Facilities	Equip all schools in Harlem with pig-tails for emergency generators.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Harlem	Low	Low	Low	Low
Enhance Emergency Shelter Facilities	Obtain emergency generator for all schools within County.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Blaine County	High	High	Low	Low
Enhance Haz-Mat Response Capabilities	Obtain SCBA units for Chinook fire department as a priorty and all departments	Fire	Blaine County	Low	Low	Low	Low

POPULATION IMPACTED

High = > 50% of County residents

Medium = 20 to 50% of County residents

Low = < 20% County residents

PROPERTY IMPACTED & PROJECT COST

High = > $500,000

Medium = $100,000 to $500,000

Low = < $100,000

COST BENEFIT FORMULA

High = "5" for Population Impacted & Property Impacted; "1" for Cost

Medium = "3" for Population Impacted & Property Impacted; "3" for Cost

Low = "1" for Population Impacted & Property Impacted; "5" for Cost

TABLE 6-4
HIGH PRIORITY MITIGATION PROJECTS

GOAL	HAZARD MITIGATION PROJECTS	HAZARDS MITIGATED	JURISDICTION	POPULATION IMPACTED	PROPERTY IMPACTED	COST	COST/BENEFIT RANKING
Enhance Early Warning Capabilities	Launch public awareness campaign so residents understand what hazards are present when sirens are used.	Fire, Flooding, Tornadoes	Blaine County	High	High	Low	High
Enhance Early Warning Capabilities	Develop warning system for train derailments involving hazardous materials.	Technological	Chinook, Harlem, Zurich, Savoy, Lohman	High	High	Low	High
Improve Fire Fighting Capabilities	Identify appropriate locations for the installation of dry hydrants to provide water for fire fighting.	Fire	Blaine County	High	High	Medium	High
Improve Fire Fighting Capabilities	Develop new water supplies in rural areas for fire fighting.	Fire	Blaine County	High	Medium	Medium	High
Improve Fire Fighting Capabilities	Obtain mobile generators for response vehicles to pump water from hydrants and/or bladders.	Fire	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	Coordinate with State Regional DES and Federal partners for scheduling and attendance at Incident Command System (ICS) 100/200 and/or IS 700 or State of Montana DES training requirement.	Fire	Blaine County/DES/DNRC	High	High	Low	High
Improve Fire Fighting Capabilities	Develop Type III Incident Management Team table of organization utilizing expertise within the county and adjacent counties within the MT State DES Region. Utilize the National Incident Management System (NIMS) as structure to identify Incident Commander(s), Safety, Information and Liaison Officers, and Operations, Planning, Logistics, Finance Section Chiefs. All Risk and Wildland Fire Type III teams may require separate specialists in operations, plans and logistics.	Fire	Blaine County/DES/DNRC	High	High	Low	High
Improve Fire Fighting Capabilities	Develop a County Wildfire-Emergency and All Risk Operations Plan, including a County/Interagency communications plan with cooperators and communities.	Fire	Blaine County/DNRC/DES/BLM/Fort Belknap	High	High	Low	High
Reduce Wildfire Hazards	Continue grazing in sustainable areas by wild and domestic ungulates to reduce fuel loading and lower potential wildfire intensity	Fire	Blaine	High	High	Low	High
Reduce Wildfire Hazards	Implement Firewise practices through creation of defensible space around communities and private homes. Utilize standard Fire Protection Guidelines for Residential Development in the Wildland/Urban Interface as identified in NFPA 1144 Standard for Protection of Life and Property from Wildfire (2002). Participate in the National Firewise Communities program.	Fire	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	Utilize and enforce Blaine County Burning Permit. Examine adjacent Counties Burning Permits and standardize requirements.	Fire	Blaine County	High	High	Low	High
Reduce Wildfire Hazards	Coordinate with cooperators to employ fuel reduction treatments on CRP and other lands with high or undesirable fuels. Treatments such as double row plow/disk perimeter, mowing vegetation, introduce prescribed fire, other mechanical treatments or a combination.	Fire	Blaine County/BLM/DNRC	High	High	Low	High
Improve Fire Fighting Capabilities	Reduce number of railroad ignitions by coordination with BNSF railroad welding crews. Request railroad right-of-way fuel reduction mowing/spraying and removal.	Fire	Blaine County	High	High	Low	High
Enhance Emergency Response Capabilities	Obtain GPS units and provide training for fire departments	Fire	Blaine County	High	High	Low	High
Enhance Emergency Response Capabilities	Construct dam on Thirtymile Creek to ensure north/south access is maintained in northern portion of County.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Turner, Hogeland	Low	High	High	High
Enhance Haz-Mat Response Capabilities	Provide Haz-Mat training to fire departments.	Fire, Technological	Blaine County	High	High	Low	High
Enhance Communication Systems	Improve communication amongst volunteer fire fighters.	Fire	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	Obtain larger fire response vehicles to accommodate mobile generators.	Fire	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	Develop GPS database of water sources in County to enhance fire fighting efforts.	Fire	Blaine County	High	High	Low	High

TABLE 6-4
HIGH PRIORITY MITIGATION PROJECTS

GOAL	HAZARD MITIGATION PROJECTS	HAZARDS MITIGATED	JURISDICTION	POPULATION IMPACTED	PROPERTY IMPACTED	COST	COST/BENEFIT RANKING
Improve Fire Fighting Capabilities	Utilize County and cooperators expertise to meet training needs. Provide incentive for fire fighters to attend training. Practice until proficient with County GPS units and cooperators communications systems.	Fire	Blaine County	High	High	Low	High
Enhance Emergency Response Capabilities	Conduct study to determine best way to address access issues associated with Thirtymile Creek crossing.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Blaine County	Medium	High	Medium	High
Enhance Early Warning Capabilities	Obtain bullhorns or loud speakers to broadcast emergencies locally.	Fire, Flooding, Tornadoes	Blaine County	High	High	Low	High
Enhance Communication Systems	Coordinate radio/repeater sites to enhance communication system.	Fire, Flooding, Technological, Tornadoes, Winter Storms	Blaine County	High	High	Low	High
Improve Fire Fighting Capabilities	With cooperators, provide classroom or video fire suppression training for rural area citizens and County employees who will response to wildland fires.	Fire	DNRC/Blaine County/BLM	High	High	Low	High
Improve Fire Fighting Capabilities	Implement fuel reduction measures along highways, communication sites, around perimeter and within communities by cutting or mowing where feasible.	Fire	Blaine County	High	High	Low	High
Enhance Early Warning Capabilities	Obtain or update sirens in all communities.	Fire, Flooding, Tornadoes, Haz-Mat, Winter Storms	Blaine County	High	High	Medium	High
Maintain Integrity of Water Supply	Assist with reconstruction of St. Mary's water pipeline that supplies Milk River.	Technological	Blaine County	High	High	High	High

POPULATION IMPACTED

High = > 50% of County residents

Medium = 20 to 50% of County residents

Low = < 20% County residents

PROPERTY IMPACTED & PROJECT COST

High = > $500,000

Medium = $100,000 to $500,000

Low = < $100,000

COST BENEFIT FORMULA

High = "5" for Population Impacted & Property Impacted; "1" for Cost

Medium = "3" for Population Impacted & Property Impacted; "3" for Cost

Low = "1" for Population Impacted & Property Impacted; "5" for Cost

6.4 PROJECT IMPLEMENTATION AND LEGAL FRAMEWORK

Once the Blaine County PDM Plan is formally adopted, the County will use the cost-benefit analysis in the Plan to focus project prioritization. Mitigation projects will be considered for funding through federal and state grant programs, and when other funds are made available through the County. Coordinating organizations may include local, county, or regional agencies that are capable of, or responsible for, implementing activities and programs. The DES Coordinator will be responsible for mitigation project administration.

A number of state and local regulations and policies form the legal framework available to implement Blaine County's hazard mitigation goals and projects. A list of these regulations and plans is presented below.

State of Montana

- Montana Subdivision and Platting Act
- Montana Building Codes
- Montana Sanitation in Subdivision

Local

- Blaine County Hazardous Material Response Plan for Transportation Incidents
- Blaine County "Master Plan"
- Blaine County Emergency Operations Plan (EOP)
- Blaine County Burn Permit Regulations

A summary of how the CWPP Plan can be integrated into this legal framework is presented below.

- Partner with other organizations and agencies with similar goals to promote building codes that are more disaster resistant on the State level.
- Develop incentives for local governments, citizens, and businesses to pursue hazard mitigation projects.
- Allocate county resources and assistance for mitigation projects.
- Partner with other organizations and agencies in north-central Montana to support hazard mitigation activities.

6.5 ROLES AND RESPONSIBILITIES

6.5.1 Coordinated Groups

The National Interagency Fire Center is comprised of USFS, FWS, NPS, BLM, BIA, National Association of State Foresters (NASF), NWS, Office of Aircraft Services and the U.S. Fire Administration and entity of FEMA. NIFC provides outreach programs, prevention techniques, and organized education to participating organizations.

The National Wildfire Coordinating Group (NWCG) provides strategic coordination between wildland firefighting agencies in Montana, northern Idaho, North Dakota and parts of South Dakota. Its primary mission is to foster interagency cooperation across jurisdictional and administrative boundaries by providing direction, adopting standards, and resolving issues common to its members. NWCG offers advanced fire fighting courses and certification for firefighters such as the "Red Card" Wildland Firefighter program. Blaine County fire entities have representation and participate in the activities of the Northern Rockies Geographic Area.

The Lewistown Interagency Dispatch Center provides initial attack dispatch service for the Lewistown Field Office of the BLM, the CM Russell Game Range of the US Fish & Wildlife Service, and the Judith and Musselshell Districts of the Lewis and Clark National Forest. The dispatch office is located at the Airport at the BLM Central Montana Fire Zone in Lewistown.

6.5.2 Federal

The BLM Offices and stations are located in Lewistown and Zortman. BLM provides fuel treatments on public lands that are adjacent to communities and provides information as to the "clear and mutual understanding of education and mitigation" for example wildfire training to various departments with the counties. BLM offices are also located in Havre and Malta, but have no wildfire suppression engines assigned.

FEMA is responsible for providing fire suppression assistance grants. Major assistance and hazard mitigation grants in response to fires are also provided by FEMA when warranted. FEMA's goal is to encourage comprehensive disaster preparedness plans and to help increase the capabilities of state and local governments in emergency management. FEMA provides programs at the federal, state and local level regarding emergency management.

6.5.3 DRNC

The Montana Cooperative Fire Agreement of 2005 and the Blaine County Cooperative Management Plan of 2004 prepared by the DNRC, clearly define the rolls and responsibilities of the DNRC, local departments and other supporting agencies. The DNRC is required by statute to provide training at no cost to state firefighters and other cooperators. Training includes activities such as fire prevention, detection, and prescribed burns in addition to fire suppression. Dozens of training courses are provided yearly to state firefighting personnel and to State/County Cooperative Fire Program personnel in every county in the State. The DNRC coordinates with federal, tribal, and local agencies in the design development, and delivery of advances courses as a member of the interagency Northern Rockies Coordinating Group (NRCG). All Montana counties participate in and have signed agreements with the state to fight wildland fires on state and federal lands not protected by an existing fire agency. The DNRC provides training, equipment and assistance when fires exceed the capabilities of local departments. DNRC provides inspection of equipment loaned to local fire departments.

The DNRC Forestry Division Northeastern Land Office in Lewistown is the office providing fire protection to the county. Unit offices in the DNRC Northeastern Land Office district that provide assistance to the county are located in Havre and Glasgow. There are no initial attack units located in the DNRC district. The DNRC provides assistance to Counties through Direct Assistance, Mutual Aid and Direct Protection. In the case of a Direct Protection incident the DNRC has primary responsibility because this fire occurred on land protected by DNRC as part of a forest fire district (or) this fire occurred on land covered by a DNRC fire protection affidavit (or) this fire poses a direct threat to lands protected by DNRC. County Assist fires are those when the DNRC is providing assistance to a County Co-op. A letter of assistance signed by the county commissioners must be submitted requesting DNRC to assist the county. Mutual aid is assistance provided by a Supporting Agency at no cost to the Protecting Agency. Mutual aid is limited to those initial attack resources that have been determined to be appropriate and which are preplanned and shown in Annual Operating Plans or mobilization guides. DNRC also provides mutual aid to one of the Fire Departments in the state under the Montana Mutual Aid Act (DNRC 2005).

6.5.4 LOCAL

The County Sheriff's Department is responsible for enforcing fire laws and maintaining public safety. A list of responsibilities and activities the Sheriff's Department provides are as follows:

- Issue and Enforce Burn Permit Requirements (*Appendix J*)
- Notify and Evacuate Residents and Provide Security to Evacuated Areas
- Provide Traffic Control and Escort Fire Equipment
- Conduct Fire Investigations to determine ignition sources
- Dispatch VFD and FD

Fire Departments and Volunteer Fire Departments are responsible for the following:

- Provide public services regarding fire suppression and prevention
- Provide public service announcements regarding emergency operations
- Conduct fire inspections
- Perform public safety demonstrations
- Educate public by holding first aid and CPR classes
- Provide wildland protection

The DES is responsible for activating the Emergency Operation Centers (EOC's) and coordinating resource ordering and allocation. DES is the point of contact for disseminating information for rural VFD's and assists the VFD's to be more efficient and streamlined in their department documentation procedures. It also ensures that timely and periodic broadcasts or announcements are issued to the public and press to advise them of hazards, conditions, and emergency information. Issuance of Emergency Declarations is an authority of the DES. This DES is active in promoting via hands on or contacting appropriate agencies training for all Rural VFD's. DES actively pursues available grants such as AFG '05.

6.5.5 FIREWISE

FIREWISE is a Community-wide Outreach Program sponsored by the NWCG. Members of the NWCG are responsible for wildland fire management in the United States and include USDA-Forest Service, the Department of the Interior Agencies, the National Association of State Foresters, the U.S. Fire Administration and the National Fire Protection Association. FIREWISE promotes fire wise practices with the following objectives:

- Educating the public and local organization by providing public outreach programs regarding wildfire hazards
- Encouraging residents to take responsibility in reducing the risk of a wildfire by creating defensible space around their home and other structures
- Increasing awareness on the benefits of prescribed burning and managed natural wildland fires to obtain ecological benefits
- Maintaining firefighter and public safety
- Provide programs such as the "Red Rock – Green Rock" program to allow communities to easily identify at risk homes and communities (FIREWISE 2005).

7.0 PLAN MAINTENENACE PROCEDURES

The Plan maintenance section of this document details the formal process that will ensure that the Blaine County Community Wildfire Protection Plan remains an active and relevant document. The Plan maintenance process includes a schedule for monitoring and evaluating the Plan and producing a Plan revision every five years. This section describes how the county will integrate public participation throughout the Plan maintenance process. Also included in this section is an explanation of how Blaine County government intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms.

7.1 MONITORING, EVALUATING AND UPDATING THE PLAN

The Blaine County Community Wildfire Protection Plan will be reviewed every *year* or as deemed necessary by knowledge of new wildfire hazards, environmental conditions, or other pertinent reasons. The review will determine whether a Plan update is needed prior to the required five year update. The Plan review will identify new mitigation projects and evaluate the effectiveness of wildfire mitigation priorities and existing programs.

The DES Coordinator will be responsible for scheduling a meeting of the Blaine County Board of Commissioners (Board) to review and update the Plan. The meeting will be open to the public and advertised in the local newspaper to solicit public input. The Board, assisted by the public will review the goals and wildfire mitigation measures or projects to determine their relevance to changing situations in the county, as well as changes in state or federal policy, and to ensure they are addressing current and expected conditions. The Board and public will also review the risk assessment portion of the Plan to determine if this information should be updated or modified, given any new available data. The list of critical facilities will also be reviewed and enhanced with additional details. The DES Coordinator will give a status report detailing the success of various wildfire mitigation projects, difficulties encountered, success of coordination efforts, and which strategies should be revised. The status report will be published in the local newspaper to update local citizens.

The DES Coordinator will be responsible for the five year update of the Plan, and will have six months to make appropriate changes to the Plan before submitting it to the Board and public for review and approval. Before the end of the five-year period, the updated Plan will be submitted to the National Fire Plan Coordinator's Office in Missoula, Montana for acceptance. The DES Coordinator will notify all holders of the CWPP when changes have been made.

7.2 IMPLEMENTATION THROUGH EXISTING PROGRAMS

Blaine County will have the opportunity to implement wildfire hazard mitigation projects through existing programs and procedures. Local officials will work with the County departments to ensure wildfire hazard mitigation projects are consistent with planning goals and integrate them, where appropriate.

A number of different state administered federal programs periodically have funds available to assist counties with hazardous fuels reduction projects, fire fighting training and others.

After the adoption of the mitigation plan, the County will work with the State Building Code Office to make sure that the County adopts, and is enforcing, the minimum standards established in the State Building Codes. In addition, the County will work with other agencies at the state level to review,

develop and ensure building construction codes that are adequate to mitigate or prevent damage by wildfire hazards. This is to ensure that life-safety criteria and flame retardant building material standards are met for new construction.

Meetings of the Board will provide an opportunity for local officials to report back on the progress made on the integration of mitigation planning elements into county planning documents and procedures.

7.3 CONTINUED PUBLIC INVOLVEMENT

Blaine County is dedicated to involving the public directly in review and updates of the Community Wildfire Protection Plan. The public will have many opportunities to provide feedback about the Plan. Copies of the Plan will be catalogued and kept at all appropriate agencies in the County as well as at the Public Library. The existence and location of these copies will be publicized in the County newspaper. Section 2.0 of the Plan includes the address and the phone number of the DES Coordinator responsible for keeping track of public comments on the Plan.

A series of public meetings will also be held prior to each annual review and five year update, or at lesser intervals when deemed necessary by the Board. The meetings will provide the public a forum for which they can express its concerns, opinions, or ideas about the Plan. The DES Coordinator will be responsible for using county resources to publicize the annual public meetings and maintain public involvement through the newspapers and radio.

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