

# *Chouteau County*

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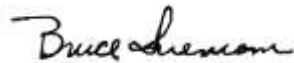
*November 2007*

# *Community Wildfire Protection Plan*

*Prepared By*  
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INCORPORATED

*PMB 2164, 1 Jackson Creek, Montana City, MT 59634*

The Chouteau County Community Wildfire Protection Plan has been prepared by, reviewed and/or approved by the following signatories:



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Prepared by: Bruce Suenram, Fire Logistics, Inc.

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Chair, Board of County Commissioners

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Chouteau County Fire Warden

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President, Chouteau County Fire Council

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BLM – Lewistown Field Office

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Lewis & Clark National Forest

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Northeastern Land Office, MT Dept. of Natural  
Resources & Conservation



# CHOUTEAU COUNTY COMMUNITY WILDFIRE PROTECTION PLAN

## 1. Executive Summary

### 1.1. Problem Overview

Chouteau County is located in North Central Montana, about 100 miles south of the Canadian border. Chouteau County is a relatively large county covering an area of 3,936 square miles. Under the current conditions, Chouteau County has a high degree of potential for extended fire seasons ranging from March through October or November. Chouteau County has fire departments located in Big Sandy, Loma, Fort Benton, Carter, Highwood, and Geraldine, and County Coop engines located in the Knees area and in the Elim areas. Chouteau County has the potential to interact with not only DNRC, but also the Bureau of Land Management, Lewistown Field Office, the Lewis and Clark NF, the Rocky Boy Indian Reservation-Bureau of Indian Affairs, thus providing a high degree of interagency complexity. As with numerous counties in Montana, there is an increasing development of wildland-urban interface areas, especially in the southern portion of the county adjacent to Cascade County, with potential access problems and a general lack of understanding of the need for an asset protection zone to protect the improvements. As a general matter, Chouteau County Fire Department has to deal with multiple ignitions throughout the county from lightning storms.

### 1.2. Process Overview

The Chouteau County Community Wildfire Protection Plan -- hereafter known as "CWPP," has been developed to assist Chouteau County, Chouteau County's Fire Departments and the federal, state, tribal wildland agencies in the identification of private and public lands at risk of severe wildland fires and to explore strategies for the prevention and suppression of such fires. The CWPP is intended to outline the Chouteau County's plans and activities targeted at reducing the risk of a catastrophic wildland and/or wildland-urban interface (WUI) fire event in Chouteau County. The intent of this planning document will ensure that the health, safety and welfare of Chouteau County's citizens remain secure from the threats of structural and wildland fires in the county.

### 1.3. Overall Goals

The CWPP will improve planning and fire suppression tools for county and the county fire department alike, which will result in Chouteau County providing its citizens with tools to live more safely in a fire prone ecosystem. The CWPP fosters the preservation of the economy of Chouteau County by maintaining and improving the efficiency of fire protection in the County.

### 1.4. Methodology

Fire Logistics, Inc. uses Geographic Information System (GIS) based analysis approach to development of the fire hazard assessment for Chouteau County. This enables personnel from Fire Logistics to look at specific areas of high risk in the county such as wildland-urban interface or subdivision areas and focus on issues that should be included in the wildland fire mitigation plan as recommended projects.

Personnel from Fire Logistics, Inc. spent 3 days in Chouteau County in October of 2005 gathering data and touring around the county gathering intelligence for the CWPP. Additional information was gathered



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from the County during visits in March, May, and June of 2006.

Fire Logistics staff developed a draft of our approach to the Chouteau County CWPP between October and March of 2007. In March, the rough draft was posted on the Chouteau County web site for review and comment by the citizens of Chouteau County.

In April 2007, comments from the responding collaborators were incorporated into the final version of the Chouteau County CWPP.

## **1.5. Mitigation Strategy – The Action Plan**

Summary of the specific action is provided, which were developed in the *mitigation plan* of Chapter 7 to include mitigation goals such as evaluate upgrade and maintain emergency wildfire protection responsibilities, decrease fuels, etc. The assumptions for planning priorities of the community fire plan are: protect human health and life, protect critical community infrastructure, protect private property, and protect natural resources. The existing mitigation efforts are described, which include asset protection zones, neighborhood preparedness and fire protection response, and the coordination of prevention programs, protection projects and response plans. Several recommended projects and programs are included as part of the mitigation effort for Chouteau County.



# Community Wildfire Protection Plan

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## 2. Introduction

### 2.1. Background and History

The Chouteau County Community Wildfire Protection Plan (CWPP) has been developed to assist Chouteau County, Chouteau County's Fire Departments and the federal and state wildland agencies in the identification of private and public lands at risk of severe wildland fires and to explore strategies for the prevention and suppression of such fires. The CWPP is intended to outline the Chouteau County Fire's plans and activities targeted at reducing the risk of a catastrophic wildland or a wildland-urban interface (WUI) fire event in Chouteau County. The intent of this planning document will ensure that the health, safety and welfare of Chouteau County citizens remains secure from the threats of structural and wildland fires in the county.

The CWPP will improve planning tools for county and the fire departments alike, which will result in better building and development codes and regulations, as they relate to the development of the WUI and urban development. The CWPP fosters the preservation of the economy of Chouteau County by maintaining and improving the fire protection capability of the County.

The Chouteau County Conservation District retained the services of Fire Logistics, Inc. to:

1. Development of a countywide Community Wildfire Protection Plan (CWPP) that meets NFP, HFRA and FEMA standards for each of the three counties: Cascade, Chouteau, and Meagher. The CWPP must be a stand alone plan. The process must follow the guidance specified in *Preparing a Community Wildfire Protection Plan - A Handbook for Wildland-Urban Interface Communities*. This document is a collaboration of a number of organizations, and can be found at the website for the Society of American Foresters <http://www.safnet.org/policyandpress/cwpphandbook.pdf> **This guidebook is incorporated by reference into this RFP.** All the elements listed in the "Summary and Checklist" of this planning guide must be covered in the CWPP; the term "forest areas" should be understood to include all vegetation types that may be subject to wildfire. Mapped components must be provided in both hard copy and GIS layers.
2. Development of a county Pre-Disaster Mitigation Plan (PDM) that meets FEMA standards for each of the three counties: Cascade, Chouteau, and Meagher. Finished plans will conform to the Federal Disaster Mitigation Act of 2000, 44CFR Parts 201 and 206; Interim Final Rule. The CWPP will cover the wildland fire hazard for each county and as such should be incorporated into the PDM plan. Guidance for FEMA compliance should be taken from FEMA's *Multi-Hazard Mitigation Planning Guidance*, available at FEMA's website <http://www.fema.gov/fima/resources.shtm> **This guidance is incorporated by reference into this RFP.** Mapped components must be provided in both hard copy and GIS layers.
3. Prepare GIS layers including: Evacuation Routes, Fuels, Floodplain, Wildland-Urban-Rural Interface Boundary, Past Fire Occurrence, Fire Prone Landscapes (interpretation of fuels, topography, fire history etc.), Critical Infrastructure, etc. Fire occurrence data should include federal, state and county records. Working with local dispatch and rural fire districts will be necessary to insure completeness of the county fire records. See Attachment A for a list of currently existing GIS layers for each county. Additional existing GIS layers are available through state, BLM and USFS sources.
4. Coordinate meetings with local committees, fire district personnel, local governments, state and federal agencies and keep them informed of activities of the countywide fire and all-hazard planning processes.



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5. Establish and maintain effective working relationships with federal, state, local governments, local fire districts and councils, corporate, and private landowners that will assist in the planning project.
6. Prepare materials and make presentations, both orally and in writing, to individuals or groups about the fire and all-hazard mitigation plans.
7. Prepare news releases, articles, and public service announcements for use by media to enhance public relations, inform the public of the fire mitigation plans.
8. Conduct assessments of individual communities and develop a prioritized list (high, medium, low) of recommended mitigation projects including both private and public lands.
9. Analyze and review the information collected and develop strategies to address fire and other hazards in each county. The hazards to be analyzed in detail (in addition to wildland fire) for each county are:
  - Cascade County: flood-dam failure; severe weather, hazardous materials spill
  - Chouteau County: flood-dam failure; severe weather, hazardous materials spill
  - Meagher County: flood-dam failure; severe weather, earthquake.
10. Provide separate budgets for the CWPP's (all counties combined) and the additional increment for the PDM plans (all counties combined). Quarterly reports detailing the planning, assessment, educational or outreach activities and accomplishments as well as dollars spent in the current period and to date for CWPP's and PDM plans separately.
11. Each county will appoint a local contact person to work with the contractor and facilitate setting up public meetings. Locations for public meetings will be determined in consultation with the counties. Public meetings are expected to be required in 3-4 locations for Cascade and Chouteau counties; one or two locations for Meagher may be adequate as long as joint meetings occur in some locations for Cascade and Meagher (e.g., Monarch, Neihart or King's Hill).

## **2.2. Mission**

The mission of the Chouteau County Community Wildfire Protection Plan is:

*"To preserve Chouteau County's natural, agricultural and manmade resources by mobilizing all citizens of Chouteau County to make their homes, neighborhoods and communities safe from fire."*

## **2.3. Current Relevant Fire Policies**

A brief discussion of the relevant fire policies is provided to educate the community.

### **2.3.1 Federal Policies "Homeland Security is Fire Safety"**

We have briefly described the relevant policies at the national level, which affect fire planning on the local level.

#### **2.3.1.1 National Fire Plan**

"The National Fire Plan (NFP) is a long-term investment that will help protect communities and natural resources, and most importantly, the lives of fire fighters and the public. It is a long term commitment based on cooperation and communication among federal agencies, states, local governments, tribes and



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interested publics.” It mandates community participation in its implementation.<sup>1</sup> The NFP also mandates that local governments develop and adopt local land use plans and ordinances that provide for the maintenance of defensible space and fuel management on municipal and private property.<sup>2</sup>

### **2.3.1.2 Western Governor’s Association, 10-Year Comprehensive Strategy for Reducing Wildland Fire Risks<sup>3</sup> and A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment—Implementation Plan**

The goals of the 10-Year Comprehensive Strategy are to:

- Improve Prevention and Suppression
- Reduce Hazardous Fuels
- Restore Fire Adapted Ecosystems
- Promote Community Assistance.

This is done through a “Framework for Collaboration... Local Level—Successful implementation will include stakeholder groups with broad representation including Federal, State, and local agencies, tribes and the public, collaborating with local line officers on decision making to <sup>4</sup>establish priorities, cooperation on activities, and increase public awareness and participation to reduce the risks to communities and environments.”<sup>5</sup>

### **2.3.1.3 Healthy Forests Restoration Act**

The Healthy Forests Restoration Act (HFRA) represents the legislative component of the Healthy Forests Initiative, introduced by President Bush in January 2003. Title I of the HFRA authorizes the Secretaries of Agriculture and Interior to expedite the development and implementation of hazardous fuel reduction projects on federal land managed by the US Forest Service or Bureau of Land Management when certain conditions are met.

Priority areas for use of expedited authorities include the wildland-urban interface, municipal watersheds, areas impacted by wind throw or insect and disease epidemics, and critical wildlife habitat that would be negatively impacted by catastrophic wildfire.

The HFRA emphasizes the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects and places priority on treatment areas identified by the communities themselves in a CWPP.

### **2.3.1.4 Disaster Mitigation Act 2000**

Disaster Mitigation Act 2000 (DMA 2000) sets policies for “disaster mitigation plans”—plans designed to avoid disasters such as fires and floods. DMA 2000 requires 4 elements in these plans:

1. A planning process.
2. An assessment of risks.
3. A mitigation strategy (action plan) and,
4. A plan maintenance and updating process.

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<sup>1</sup> See [www.fireplan.gov](http://www.fireplan.gov).

<sup>2</sup> See [www.westgov.org/wga/initiatives/fire/implement\\_plan.pdf](http://www.westgov.org/wga/initiatives/fire/implement_plan.pdf)

<sup>3</sup> [www.westgov.org/wga/initiatives/fire/final\\_fire\\_rpt.pdf](http://www.westgov.org/wga/initiatives/fire/final_fire_rpt.pdf)

<sup>4</sup> The full text of the Act is available at <http://thomas.loc.gov/>. Type HR 1904 in the Bill Number box and then select the enrolled bill from the list of options.

<sup>5</sup> [www.westgov.org/wga/initiatives/fire/implement\\_plan.pdf](http://www.westgov.org/wga/initiatives/fire/implement_plan.pdf)



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Disaster Mitigation Plans must be approved by 11/04 to receive HMGP funds after that date.<sup>6</sup>

### **2.3.1.5 Local Implementation of Federal Fire Policies**

Fire protection objectives on the state and private lands in Chouteau County are addressed indirectly in the Cooperative Fire Management Agreement between USDI's Bureau of Land Management, National Park Service – Intermountain Region, Bureau of Indian Affairs – Portland and Billings Area, US Fish and Wildlife Service – Rocky Mountain Region; USDA's Forest Service – Northern Region; and the State of Montana – Department of Natural Resources and Conservation. This agreement requires that Annual Operating Plans be developed and approved by May 1 of each year specifying how the terms of the agreement will be carried out between the cooperating agencies and the state. Cooperation with local county governments is encouraged and additional agreements are executed with Chouteau County. These agreements are to validate the arrangements desired between the county and a federal agency or the state in respect to assistance with their fire management programs.

As a minimum, those procedures for obtaining state and federal assistance for large wildland fire needs to be included in any agreements prepared at the local level. They should include an articulation of the suppression standards that need to be employed by federal or state agencies working on a fire on state and private land. The reverse is also true for county resources working on federal or state lands. In the former case the objective will most likely be to suppress the fire at the smallest size possible utilizing the full range of suppression resources available. In the latter case, however, certain land management objectives may preclude this approach, i.e., mechanical equipment in an Area of Critical Environmental Concern.

There may be circumstances where a fire is human caused and assistance in an investigation is needed. The skill to be a fire investigator can either be developed within the county or it can be brought in from another agency on an as needed basis. Whichever route is chosen, there should be no delay in utilizing a fire investigator when the situation is warranted.

### **2.3.2 State Policies**

The Montana Legislature adopted the following state fire policy during the 2007 legislature. The legislature finds and declares that:

- (1) The safety of the public and of firefighters is paramount in all wildfire suppression activities;
- (2) It is a priority to minimize property and resource loss resulting from wildfire and to minimize expense to Montana taxpayers, which is generally accomplished through an aggressive and rapid initial attack effort;
- (3) Interagency cooperation and coordination among local, state, and federal agencies are intended and encouraged, including cooperation when restricting activity or closing areas to access becomes necessary;
- (4) Fire prevention, hazard reduction, and loss mitigation are fundamental components of this policy;
- (5) All property in Montana has wildfire protection from a recognized fire protection entity;
- (6) All private property owners and federal and state public land management agencies have a responsibility to manage resources, mitigate fire hazards, and otherwise prevent fires on their property;
- (7) Sound forest management activities to reduce fire risk, such as thinning, prescribed burning, and insect and disease treatments, improve the overall diversity and vigor of forested landscapes and improve the condition of related water, wildlife, recreation, and aesthetic resources; and
- (8) Development of fire protection guidelines for the wildland-urban interface is critical to improving public safety and for reducing risk and loss.

<sup>6</sup> [www.fema.gov/pdf/fima/howto1.pdf](http://www.fema.gov/pdf/fima/howto1.pdf)





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Currently there are no State policies that require a rural fire district or county fire organization to develop a community wildfire protection plan; however, it certainly is encouraged by the State Fire Policy. Indirectly, it is a requirement to access federal funds for fuel reduction.

It is the policy of the State to complete pre-disaster mitigation plans in compliance with the Federal direction noted above.

### **2.3.3 Local Policies**

Fort Benton-Chouteau County established a Fort Benton Planning Area Growth Policy in 2003 that includes the City of Fort Benton plus 4.5 miles beyond the corporate city limits. Chouteau County adopted the Chouteau County Growth Policy in 2004. In 1999, the Montana Legislature revised this community development and planning tool and renamed it the Growth Management Policy. The requirements of a Growth Management Policy are detailed in 76-1-601, Montana Code Annotated. The Fort Benton Area Growth Policy and the Chouteau County Growth Policy provide guidance as the community grows and develops. Special attention is given to specific land uses and the need for infrastructure to support those identified uses. Preparing a growth policy includes describing the historical base, establishing key indicators and monitoring the growth trends, and developing policies to accommodate the potential growth and changes in the community.

In the Fort Benton Area Growth Policy, the Public Safety Goal is:

“Ensure that all fire service entities are providing adequate fire fighting and emergency response services, apparatus, equipment, personnel, training and facilities.”

Further the Growth Policy establishes four policy statements:

1. Encourage the fire department to clearly define the level and types of services they provide and move toward development and adoption of a fire protection master plan for their service area.
2. Facilitate the completion of the fire protection facilities portion of the Fort Benton Capital Improvement Program.
3. Provide appreciation, support, and assistance to ensure there are adequate volunteer personnel providing essential emergency services to the area.
4. Encourage the Fort Benton Volunteer Fire Department to consider multi-agency partnerships to provide specialized emergency services such as hazardous materials response, high and low angle rescue and confined space rescue.

Chouteau County's Growth Policy has a Public Safety Goal, which says:

“Provide adequate and timely emergency services to all County residents.”

The County's Growth Policy has several policy statements which provide some overall direction to this CWPP, the most significant are:

1. Economy & Population – Encourage business retention and expansion by blending new technology and innovative practices with traditional economic base industry.
2. Economy & Population – Preserve natural resources, including historic and scenic, for the enjoyment and benefit of all.
3. Local Services – Coordinate between rural fire departments and with agencies with fire fighting responsibility on public lands.
4. New development should have adequate water supply for fire fighting and incorporate fire



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- protection measures in their design.
5. Discourage development where services can not be provided in a timely manner.
  6. Design standards for roads should include provisions for adequate emergency vehicle access.
  7. Coordinate with fire fighting agencies to promote programs for homeowners that will assist with wildfire issues.

Subdivision regulations are normally developed after completion and adoption of the Growth Policy. The existing Subdivision Regulations have not been up-dated since the adoption of Chouteau County's Growth Policy. In ***Planning for Wildfires***, three strategies are offered for dealing with development in the wildland-urban interface, they include:

1. Conduct Wildfire Planning in a comprehensive planning context. This CWPP accomplishes this strategy.
2. Conduct a program of regulation and enforcement that stresses continuous individual responsibility by homeowners and property owners including:
  - a. Subdivision regulations.
  - b. Zoning regulations, such as a wildland-urban interface overlay.
  - c. Building and fire codes
3. Conduct an effective ongoing program of education and outreach to affected residents and property owners.<sup>7</sup>

The County's Development Regulation has been recently up-dated, but needs revision to include requirements for asset protection zones in wildland-urban interface areas.

A Pre-Disaster Mitigation Plan (PDM), developed by Fire Logistics, Inc., is another tool developed to provide Chouteau County with insight into the potential events, which might impact the County. Wildland fire was ranked in the top 5 natural hazards in Chouteau County. As a result, Chouteau County's PDM has the following goals which apply to this CWPP:

- Prevent personal injury, loss of life and damage to property and the environment from natural and technological hazards.
- Document hazards, risk assessments, and vulnerabilities and rate those hazards based on probability and potential impact to the County.
- Encourage public participation in preparedness and mitigation activities, by promoting public awareness and an understanding of natural and technological hazards; as well as the risk those hazards potentially present to quality of life and economic vitality.
- Form partnerships with private and public sector agencies, businesses and organizations to further comprehensive planning and implementation of mitigation measures.
- Establish a framework for reducing future losses from technological and natural disasters.
- Prepare for, mitigate, avoid, reduce and minimize the disruption, damage and losses that occur from a disaster and facilitate post-disaster funding.
- Sustain existing public safety programs by assessing current emergency services capabilities and identifying future needs.
- Enhance public safety, by improving the capabilities of emergency services to respond to and recover from the effects of hazards on people, property and the environment.
- Define a strategy with goals and objectives for long-term and comprehensive mitigation measures and activities.

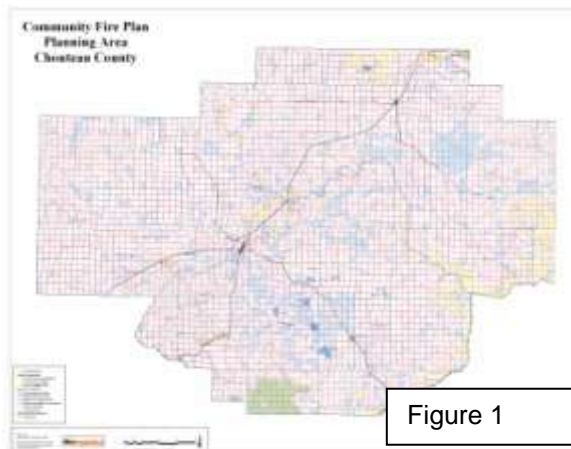
<sup>7</sup> Planning for Wildfires; American Planning Association; 2005



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## **2.4. Planning Area Boundaries**

The Chouteau County CWPP covers Chouteau County in its entirety. The county was further subdivided into sub-planning areas by the 5<sup>th</sup> Code Watershed. The purpose of the 5<sup>th</sup> Code Watershed is to provide a uniquely identified and uniformed method of subdividing large drainage areas. These smaller 5<sup>th</sup> Code Watershed units are approximately 40,000 acres to 250,000 acres and are useful for fire planning purposes as well as other programs by the Natural Resources and Conservation Service and other agencies.



## **2.5. Community Legal Structure, Jurisdictional Boundaries**

There is a mixture of fire protection organizations providing fire services to Chouteau County. These include Fort Benton Fire Department (MCA 7-33-4101-4133), Fort Benton Rural Fire District (RFD), Big Sandy RFD, Geraldine RFD and Highwood RFD (MCA 7-33-2101-2129), Loma, Knees, Elim and Carter Volunteer Fire Companies (MCA 7-33-2311-2316), Chouteau County Fire Department (MCA 7-33-2201-2211), MT Department of Natural Resources and Conservation – County Cooperative Program, Rocky Boy Indian Reservation, Bureau of Indian Affairs, Lewis and Clark National Forest and Bureau of Land Management (See Figure 1 and Jurisdictional Areas Map in Map Section 10.5).

There is a county-wide mutual aid agreement under which resources can be requested to provide assistance to another fire entity.

The Bureau of Land Management is the responsible land management agency for BLM lands and assists the local agencies as needed. The Lewis and Clark NF is the land management agency responsible for the National Forest Lands in Chouteau County and assists the County as needed. The Rocky Boy Indian Reservation provides fire protection to the reservation and provides assistance to the County as requested. Chouteau County assists the Tribal Governments and federal agencies with fire protection assistance as requested.

The Department of Natural Resources and Conservation – County Cooperative Program provides fire support to counties when the county's capability has been exceeded and assistance is requested.

## **2.6. Acknowledgements**

Fire Logistics, Inc. would like to thank the Chouteau County Fire Warden; Chouteau County DES, especially Linda Williams and Glenda Tonne; Big Sandy VFD – Fire Chief Larry Ophus; Loma VFD – Fire Chief Gar Wood; Fort Benton VFD – Fire Chief Pat Hutlin; Carter VFD – Fire Chief Darin Arganbright; Elim VFD – Fire Chief Christina Taylor; Geraldine VFD – Fire Chief Rob Ebeling; Highwood VFD – Fire Chief Rich Hartman; The Knees VFD – Fire Chief Dan Piccard; Bureau of Land Management, especially Shannon Downey and Gary Kirpach; Lewis and Clark National Forest, especially Lee Clark Forest FMO and Jim Homison, Stanford District FMO; Chouteau County Planning Board; Chouteau County Conservation District; the Chouteau County Local Emergency Planning Committee; the Chouteau County Fire Council and Chouteau County Board of County Commissioners for their contributions to this plan.



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### 3. Planning Process

#### 3.1. Stakeholders

The following stakeholders are affected by wildland fire and have a stake in a successfully implemented CWPP:

- Fort Benton VFD
- Big Sandy VFD
- Loma VFD
- The Knees VFD
- Elim VFD
- Carter VFD
- Highwood VFD
- Geraldine VFD
- Chouteau County Fire Warden
- MT Dept. of Natural Resources and Conservation
- Bureau of Land Management
- Lewis & Clark NF
- Rocky Boy Indian Reservation
- County Assistance Team (CAT)
- City of Fort Benton
- Burlington Northern Santa Fe Railroad
- Chouteau County Local Emergency Planning Committee
- Chouteau County Road Department
- Chouteau County DES
- Board of County Commissioners – Chouteau County
- Residents of Chouteau County

#### 3.2. Current Process and Plan Development

In the summer of 2005, the Chouteau County Conservation District awarded a contract to Fire Logistics, Inc. to complete a comprehensive risk assessment of Chouteau County and to develop a mitigation plan which provides recommendations for improvements to the county's fire protection system, mitigation measures for treating the fuels and providing protection to structures. The Chouteau County Community Wildfire Protection Plan (CWPP) is the result of that effort.

##### 3.2.1 Avenues of Community and Public Input – Collaboration

Public meetings of the Chouteau County Planning Board, Chouteau County LEPC and the Chouteau County Rural Fire Council were held on October 4, 2005, November 11, 2005, May 8, 2006, and June 5, 2006 to discuss the CWPP. The following were discussed in these public meetings:

- Mission of the CWPP
- Goals of the CWPP
- Project identification
- Designation of wildland-urban interface areas
- Review draft of the CWPP

In addition, a draft of the CWPP was placed on Chouteau County's web site and a press release was placed in the River Press to notify county residents of the ability to review the document and provide comments on the draft CWPP.



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Comments were incorporated into the final version of the Chouteau County CWPP.

### **3.3. Review of Existing Plans, Studies, Reports, Technical Documents**

The following documents have been reviewed for data, which may need to be referenced and incorporated in the Chouteau County CWPP:

- Wildland Fire Hazard Assessment and Mitigation Plan for the Rocky Boy Indian Reservation; March 2004.
- Chouteau County Cooperative Fire Management Agreement
- Chouteau County Growth Policy Plan; 2004.
- Fort Benton Planning Area Growth Policy; 2004.
- Public Protection Classification Results – Loma FD; 2004.
- Public Protection Classification Results – Fort Benton; 1993
- Memorandum of Understanding between USFWS – Benton Lake National Wildlife Refuge and Chouteau County
- Mutual Aid Agreement between Chouteau County, Pondera County, Teton County, Toole County, Liberty County, Glacier County, Judith Basin County and Fergus County.
- Chouteau County Fire Council Mutual Aid Response Plan; 1993.
- FY 2005 Annual Operating Plan between the USFS Lewis & Clark NF – Judith Ranger District and Chouteau County Fire Districts; 2005.
- Advancing Wildland Fire Training for Fire Departments – Implementation Plan; 2006.
- Subdivision Regulations of Chouteau County; 1997.
- Chouteau County Development Regulations; 2005.

### **3.4. Local Jurisdictional Involvement, Approval, Adoption**

Once the Chouteau County CWPP is reviewed and approved by the Board of County Commissioners, it should be adopted as the fire component of Chouteau County's Pre-Disaster Mitigation Plan.



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## 4. Community Description

### 4.1. General Environmental Conditions

Chouteau County is located in north central Montana. It covers just over 3,973 square miles and has a population of about 5,970 people. The county also crosses seven distinct watersheds. Most lands in the county are used for some type of agriculture and as a result, agriculture is the county's number one industry. The majority of the terrain is relatively flat when compared with the western part of the state and the elevations in the County range from 7,680 feet in the Highwood Mountains to less than 2,300 where the Missouri River exits the County. The county receives approximately 13 inches of rainfall a year in Big Sandy to a high of 29 inches a year in the Highwood Mountains and the adapted ecosystems contain vegetative types and quantities commensurate with soil productivity and available moisture. The Missouri River Break areas of the county are subject to intense lightning storms during the summer months.

#### 4.1.1. Topography, Slope, Aspect, Elevation

The main drainages are Missouri River flowing west to east, Teton River flowing from the west to the east, and Marias River flowing northwest to the southeast. Streams of secondary importance are Highwood, Shonkin, Big Sandy and Arrow Creek. The northern portion of the county drains south into the Marias and Missouri Rivers, and the western portion of the county drains into the Teton River, while the southern half of the county drains to the north into the Missouri River.

This area north of the Missouri River contains rolling topography with some scattered steep slopes and knobs located in the area of the Rocky Boy Indian Reservation. These are most common in the vicinity of the Centennial Mountain and Bailey Peak. The elevation change north of the Missouri River is about 2500 feet and may contribute to winds associated with wildland fires at night in the County north of the Missouri River. South and west of the Missouri River the terrain is made up of rolling upland plateaus and benches, with moderate deep canyons. The eastern portion of the county is primarily badlands and breaks. Elevation changes are more pronounced and approach 5,000 feet toward the southern boundary of the county in the Highwood Mountains. Along the conifer covered ridges, the slopes fluctuate widely, with some steep pitches approaching 60% plus.

Aspect is the direction toward which a slope faces. Because of the topographic nature of Chouteau County, the area north of the Missouri River has a higher representation of southern aspects, whereas south of the Missouri River the terrain is more conducive to all aspects being more or less equally represented.

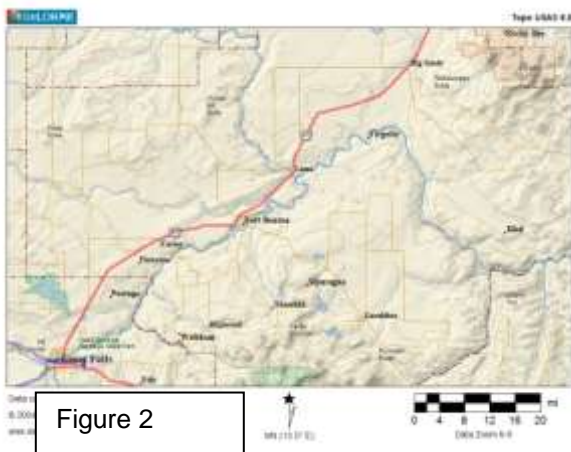


Figure 2 shows the topography of Chouteau County and it is evident that there is some correlation between slope, elevation and vegetative cover types. The pine forest is generally located on higher ground in distinct bands where soil and moisture conditions are conducive to its survival. The ponderosa pine type is usually denser on north and east aspects where the soils can retain moisture somewhat longer than they can on south and west aspects.

The tillable lands that can be irrigated are used for



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hay; grain and root crops while the remaining lands are left in a natural state or are in the Conservation Reserve Program (CRP). These CRP lands are source of great concern to government officials in Chouteau County due to their extremely flammable nature and potential for large fire growth.

### **4.1.2. Meteorology, Climate, Precipitation and Fire Weather**

Weather directly affects fire behavior, with wind and low humidity values being the major influencing factors due to their ability to rapidly dry fuels and allow fires to grow rapidly. Generally, steering winds at the surface and aloft over central Montana in the spring and summer prevail out of the south to west and are moderate to strong across open areas with lighter winds over hilly or mountain areas. Surface winds vary depending on the method used for developing the winds, elevation, aspect and openness of the local terrain. Southwest and west facing slopes are more exposed to the prevailing winds and have drier fuels, which relates to increased fire behavior activity. Fires generally spread from southwest to northeast.

Wind speeds are of great concern for fire fighters and strongly influence all fire activity. Winds are generally caused by one of five methods. The first method is pressure gradient winds. These winds are caused by winds trying to equalize pressure between high and low pressure systems. An example of this is a cold frontal passage accompanied by gusty winds. These winds are typical of open grassy areas found across large portions of northern Chouteau County. A second method for generating winds is by diurnal heating and cooling of the land. These winds are typically found in mountain or hilly areas where daytime upslope and nighttime down slope winds occur. These winds are usually lighter than pressure gradient winds but can be over-ridden by strong pressure gradient winds. The third method of producing wind is by outflow from thunderstorm activity. These winds can be very erratic as well as very gusty and can challenge all wildland fire suppression efforts and lead to fire fighter safety concerns as well as the potential for large wildland fire growth. The fourth method is primarily a winter phenomena with strong to very strong lee slope winds. The fifth method is winds created by elevation cooling of the air mass between the Bears Paw Mountains and the Missouri River creates winds up to 40 miles hours through the night time hours.

The normal summer weather pattern for central Montana can best be understood by looking at the larger weather pattern for the entire western United States. The Bermuda High located in the Caribbean and Gulf of Mexico makes its way across Texas and New Mexico by July and cuts off a supply of low-level moisture from the Gulf of Mexico to the plains of North America. This cause's general thunderstorm activity to decrease across central Montana as the low level moisture diminishes. This allows the lower atmosphere to dry with a corresponding lowering of humidity values. This is timed with the development of a high-pressure system that sets up across Montana with subsidence within the high-pressure system that dries the atmosphere. This subsidence does two things; it brings very warm temperatures (95-110) to the area and it significantly lowers the relative humidity values. During this time overnight humidity recovery becomes poor allowing the drying of fuels of all size classes (1 hour, 10 hour, 100 hour, and 1000 hour plus time lag fuels). The 1-100 hours time lag fuels will show evidence of drying within 3-5 days. The 1000 hours fuels will take significantly longer to dry, usually in the 3-5 weeks range.

The typical fire season in central Montana is from early spring into the fall or early winter or from March through November. Spring, before green-up, can be a time of large fire growth as dry residual winter cured fuels combined with gusty winds pose a threat of large fires. Moisture in the spring provides for fuel growth and is a time for prescribed fire activity. As the season turns to summer, the amount of moisture from thunderstorms taper off while grasses and shrubs begin to lose their live fuel moisture, down fuels begin to dry, and fire conditions normally peak by late August. As autumn approaches, conditions generally begin to cool and killing frost begins to affect fuels. Dry cold frontal passages become common and can promote conditions of extreme fire behavior especially when accompanied by very strong winds. Late fall conditions in late October and November mark the transition into winter, but again, dry cold frontal passages at this time of year and the lack of snow pack can lead to conditions of rapid fire growth and high intensity fire behavior during wind events.



## *Community Wildfire Protection Plan* *Chouteau County, Montana*

Climatic seasonal changes can influence fire behavior as well. Winter months of December through February are generally non-fire months, but snow pack accumulations can be a key factor in potential fire activity for any given fire season. In the last half of the 20<sup>th</sup> century, spring seasons (April through June) were generally moist months with low fire frequencies. The ignitions that did occur resulted in mostly low intensity fires. Since 1988, the weather patterns have been changing to a warmer and dryer cycle resulting in extended fire seasons; spring months no longer can be counted on as a low fire period of the year. Long-term drought conditions have increased the fire complexity in central Montana and Chouteau County and it is not unusual for significant pre green-up fires to occur in the early spring.

Moisture regimes in the spring and summer can be defined in terms of storm tracks, which typically move across the county from southwest to east. The storm track affecting the analysis area starts along the western or southern edges of Chouteau County and tracks northeastward across the county before moving out onto the eastern plains of Montana. Significant moisture associated with these storm tracks will be higher in April and May and will trend downward in June with mainly dry thunderstorms expected in July and August. Thunderstorm activity is possible in September and early October but at a much-reduced rate compared to early spring.

Winters have been mild for the past few years with a pronounced drought that affected large portions of the Northern Rockies. Winter and spring snow events have been fewer with less snow accumulating over the mountains with streams and rivers flowing at or near record low levels. In addition, subsurface moisture continued to be short helping to stress vegetation of all types. Bug kill has spread across large portions of the Northern Rockies and forested areas of Chouteau County over the past few drought years providing standing dead fuels for potential large fires. The winter of 2005-2006 continued this trend with warmer than normal conditions along with drier than normal moisture however several spring storm systems in March and April 2006 have provided much needed widespread moisture across large portions of Montana. While this moisture has helped the agriculture community and helped replenish surface and subsurface moisture with near normal streams and reservoirs, the long-term drought continues to pose potential large fire problems in the larger fuel types.

The higher elevations in the Highwood Mountains of southern Chouteau County provide the orographic lifting that results in more moisture to this forested area with a corresponding increase in thunderstorm activity. Heavy lightning activity associated with these storms contributes to a significant number of fire starts along the storm's path especially in late July and August. Dry lightning events increase during this period with these thunderstorms often producing strong down draft winds with little if any rain. These storms can be several miles wide at their bases with lightning expected anywhere within a 40-50 mile radius of the storms.

A review of the fire history for Chouteau County for the years 1991-2005 showed the following:

1. Average maximum temperature warmest in July and August.
2. Average wind speed was strongest in winter, early spring and late fall. During the summer winds are light to moderate with the higher winds over open ground and from a westerly direction. Wind gusts during the summer were strongest from thunderstorm outflow winds.
3. August is consistently the driest month with weather records showing poor nighttime relative humidity recovery. During the day light hours the relative humidity begins to drop substantially beginning at 0900 and remains low until 2100. These lows bottom at the lower teens around 1700-1800. In reviewing the weather history, there are also days in August where relative humidity values remained low for multiple twenty-four hour periods.
4. Moisture events did occur in August, but were limited in location, content and duration. The remnants of these events kept the maximum relative humidity high in that particular area for a period of seven days after initiation.
5. Continued drought conditions have begun to modify but have stressed large fuels.
6. Drought stressed conifer stands contributed to large fire spread, where high fire intensities did not allow for aggressive initial attack or fire suppression with ground forces due to safety concerns.





# Community Wildfire Protection Plan

## Chouteau County, Montana

7. Lightning occurrence usually begins in April with the heaviest occurrence in May and June. Dry Lightning is most prevalent July and August.

Tabular conditions of temperature, humidity, precipitation and winds are listed below. Caution should be used with the November data as the sample period is limited. These conditions are more typical of mountain locations while warmer temperatures, lower humidity values and stronger winds can be expected over open areas.

Chouteau County		Years 1991-2005								
Temp	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
<b>Max</b>	57.3	65.5	74.3	79	94	93.8	82.4	69.2	53.5	
<b>Avg</b>	48.6	58	68	76.1	86.3	86.5	75.5	59.7	45.2	
<b>Min</b>	31	51.6	59.1	70.4	71.4	76.7	68.6	22.3	29.4	
RH	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
<b>Max</b>	54.6	42.9	58.1	43.9	51.4	40	35.9	58.7	57.2	
<b>Avg</b>	37.6	33	33	35.2	27.6	23.8	27.4	35.6	44	
<b>Min</b>	27.1	25.5	15.7	28	13.2	15.9	19.7	24.7	31.3	
Pcpn	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
<b>Max</b>	1.84	3.1	4.68	4.45	4.46	2.99	1.19	1.87	0.97	
<b>Avg</b>	0.44	1.2	2.1	2.82	1.55	1.08	0.63	0.79	0.36	
<b>Min</b>	0.04	0.16	0.31	0.58	0.03	0	0.18	0.45	0	
Wind	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
<b>Max</b>	9.2	10.4	11.1	10	8.9	9.2	8.9	9.8	9.7	
<b>Avg</b>	8	8.6	9	8.4	7.6	7.8	8	7.8	7.3	
<b>Min</b>	6.6	7.2	7.5	7.1	6.7	7.1	6.8	6.3	5.7	

### 4.2. Population, Demographics

Population and demographics information was derived from the 2000 Census. The population for Chouteau County was 5,970. The population of Fort Benton is 1,594. In the county the population was spread out with 28.80% under the age of 18, 6.50% from 18 to 24, 24.10% from 25 to 44, 23.10% from 45 to 64, and 17.50% who were 65 years of age or older. While these demographics don't indicate the population is aging, the demographics of Geraldine and Highwood indicate that the population over the age of 65 is a significant concern. Because of the aging population and the fact that the majority of the county's younger residents must move away to find work, there is a significant problem in recruiting and retaining volunteer fire fighters for the county fire departments.

### 4.3. Infrastructure: Roads, Driveways, Utilities, Communication, and Water Supply

Highway 87 traverses Chouteau County from the southwest to the northeast. Montana Route 80 is a primary highway that extends southeast from Fort Benton to Stanford. Secondary Highways include Montana 228 that runs south to Highwood and Montana 223 running to the northwest to Chester. Chouteau County maintains an extensive network of graveled roads that can be utilized to provide access for fire suppression activities.

There are access problems along the river corridors, where there is no access or access is limited to ferry crossings or significant travel times are required due to poor direct access routes. Another significant



# Community Wildfire Protection Plan Chouteau County, Montana

problem that fire suppression activities would face with access during the wildfire season is the gumbo road conditions following a rain or thunderstorm event and the subsequent heavy rains.

Burlington Northern Santa Fe Railroad tracks generally follow Highway 87 through the county to Fort Benton and have a significant amount of rail traffic which has the potential to start wildland fires.

Large propane tanks are located throughout Chouteau County at ranch and home sites.

Electric transmission lines and distribution power lines along with telephone lines and railroad signal lines are concentrated along Highway 87 and local distribution lines to some populated areas. Northwestern Energy, Sun River and Hill County Electric Cooperatives provide electrical power to the county.

Qwest, Central Montana Communications, and Triangle Telephone Cooperative provide telephone service to Chouteau County.

Cellular phone service is generally available; however, there are areas within the county that do not have cellular phone service. Cellular phone service is provided Verizon, Altel, and Chinook Wireless.

There are municipal water systems serving the Towns of Fort Benton, Highwood, Geraldine, Loma and Big Sandy for fire protection purposes. In the County, there is no developed water supply and water tenders must transport fire protection water to the fire scene. Stock ponds and creeks are available at times for a water supply point, but during this extended drought, water is a premium to ranchers.

Radio communication for Chouteau County Fire Departments is generally very good except for along the Missouri River Corridor.

## 4.4. Emergency Services

Emergency services within Chouteau County include fire protection, emergency medical services including ambulance transportation, law enforcement, and emergency preparedness.

### 4.4.1. Fire Protection

The Fort Benton Fire Department, Fort Benton Rural Fire District, Geraldine Rural Fire District, Highwood Rural Fire District, Big Sandy Rural Fire District, Carter Fire Department, Knees VFC and the Loma Fire Department provide community structural fire suppression and protection.

Wildland fire protection is provided by all of the above fire entities plus the Elim VFC under the direction of the county fire warden with various fire suppression resources throughout the County under the Chouteau County Co-Op plan. The wildland fire apparatus is located strategically throughout the county (See Figure 3 and Fire Station Location Map in Map Section 10.5).

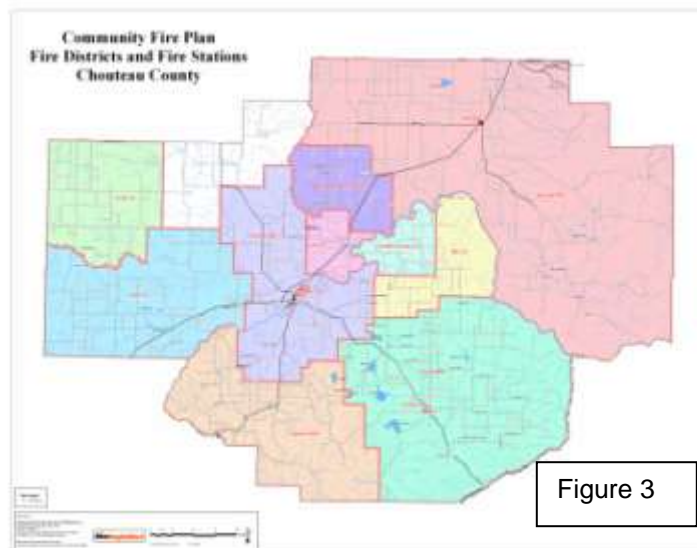


Figure 3



# Community Wildfire Protection Plan

## Chouteau County, Montana

Big Sandy Fire Department	
Location	Apparatus
Big Sandy Fire Station	
	Engine 111 – Type 1 (1980)
	Engine 112 – Type 1 (1977)
	Tanker 1T1 (1981)
	Engine 161 – Type 6 (1989)
	Engine 162 – Type 6 (1993)
	Engine 163 – Type 6 (1974)
	Engine 164 – Type 6 (1981)
	Engine 165 – Type 6 (1967)
	Engine 1491 – Type 6 (1983)
	Engine 1590 – Type 6 Heavy w/Foam (1990)
	Ambulance (1998)
	Ambulance (2003)
	Rescue – Super Vac (1977)
	Suburban – Command Vehicle



**Big Sandy Fire Station**



**Big Sandy FD Ambulance**



**Big Sandy Engine 1590**





# Community Wildfire Protection Plan Chouteau County, Montana

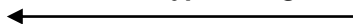
Carter Fire Department	
Location	Apparatus
Carter Fire Station	
	211 – Type 1 Engine
	231 – Brush/Tanker
	261 – Type 6 Engine



**Carter FD Water Tender**



**Carter FD Type 1 Engine**



Elim VFC	
Location	Apparatus
Taylor	361 – Type 6 Engine
Tadejs	362 -- Type 6 Engine



**Elim VFC Engine 361**



**Elim VFC Engine 362**





# Community Wildfire Protection Plan Chouteau County, Montana

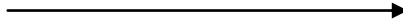
Knees VFC	
Location	Apparatus
Knees Fire Station	
	611 – Type 2 Engine
	662 – Type 6 Engine
	DSL Trailer Mounted Pump



**Knees VFD Engine 611**



**Knees VFD Engine 662**





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Fort Benton Fire Department	
Location	Apparatus
Fort Benton Fire Station	
	Engine 411 – Type 1
	Engine 421 – Type 2
	Engine 431 – Type 3
	Engine 451 – Type 5
	Engine 461 – Type 6
	DSL 191 – Type 3 Engine with foam



**Fort Benton Rural FD Engine 431**



**Fort Benton FD Engine 411**



**DSL 191 – Type 3 Engine with foam**





# Community Wildfire Protection Plan Chouteau County, Montana

Geraldine Rural Fire District	
Location	Apparatus
Geraldine Fire Station	
	521 – City Engine – Type 2
	533 – Engine Type 3
	562 – Engine Type 6
	564 – DNRC Engine Type 6
	Ambulance



**Geraldine RFD Engine 562**



**DNRC Engine 564**



**Geraldine RFD Engine 533**



**Geraldine RFD Engine 521**





# Community Wildfire Protection Plan Chouteau County, Montana

Highwood Rural Fire District	
Location	Apparatus
Highwood Fire Station	
	811 – Type 2 Engine
	812 – Water tender 3200 gallons
	861 – Type 6 Engine
	862 – Type 6 Engine
	Command & Supply Vehicle



**Highwood RFD Water Tender 812**



**Highwood RFD Engine 811**



**Highwood RFD Engine 862**



**Highwood RFD Command & Supply Vehicle**







# Community Wildfire Protection Plan Chouteau County, Montana

Loma VFC	
Location	Apparatus
Loma Fire Station	
	Engine 711 – Type 1
	Water Tender 733 – Type 3
	Engine 7-1102 – Type 6
	Engine 764 – Type 6



**Loma VFD Engine 711**



**Loma VFD Engine 7-1102**



As a “Coop County,” Chouteau County is required to make a significant commitment to a wildland fire before requesting assistance from Montana DNRC. As part of the county equipment, Chouteau County furnishes water tenders, dozers and motor graders from the County Road & Bridge Department for wildland fire suppression efforts in the county.

Chouteau County is within the Northeastern Land Office (NELO) of Montana DNRC’s geographic area. When State assistance is requested the NELO provides additional resources such as air tankers, helicopters, single engine air tankers and crews and overhead. During the fire season these resources may be committed to other incidents and may not be available.

Chouteau County Disaster Emergency Services has mutual aid agreements with surrounding counties and these have recently been updated.

### 4.4.1.1. Fire Engine Pump/Draft Source Sites

Water supply sources for wildland fire protection and structural fire protection throughout Chouteau County are relatively scarce. They include rivers, creeks, stock ponds and reservoirs. Due to the long-term drought in Chouteau County, most ranchers would not authorize fire protection entities to utilize their scarce water resources for fire protection. As a result during this extended drought period, water supply sources need to be delivered to the fire, through fire apparatus such as water tenders. There is no map of the water sources in the county.



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### **4.4.1.2. Training, Certification, and Qualification**

All incidents require different skill levels of incident management personnel. To assist in assigning appropriate incident commanders to wildland fire incidents, an incident analysis can be used as a guide to identify and mitigate certain complexity and safety issues by selecting a different strategy, tactic, or higher qualifications of incident command personnel. Certain assumptions are made in this analysis:

- As an incident becomes more complex, the need for more competent incident management personnel, an incident management team or organization increases.
- To facilitate assembling an efficient and effective organization, key managers should be involved during the early stages of the complexity analysis; this should include federal, state, and local partners.
- The incident analysis is not a cure-all for the decision process; local fire history, current fire conditions, and management experience must be considered.

All wildland fires, regardless of size, must have an assigned Incident Commander (IC). The training, certification and qualifications of the Incident Commander (IC) vary by the type, size and complexity of fire. General guidance is:

#### **Type 5 Incident**

- Resources required typically vary from two to six fire fighters
- The incident is generally contained within the first burning period and often within a few hours after resources arrive on scene.

#### **Type 4 Incident**

- Command staff and general staff functions are not activated.
- Resources vary from a single resource to several resources.
- The incident is usually limited to one operational period in the control phase.
- No written incident action plan (IAP) is required. However a documented operational briefing will be completed for all incoming resources (See Briefing Checklist – Incident Response Pocket Guide).

#### **Type 3 Incident**

- In-briefings and out-briefings are more formal.
- Some or all of the command and general staff positions may be activated, usually at the division/group supervisor and/or unit leader level.
- Type 3 organizations manage initial attack fires with a significant number of resources, an extended attack fire until containment/control is achieved, or an escaped fire until a Type 1 or Type 2 team assumes command.
- Resources vary from several resources to several task forces or strike teams.
- The incident may be divided into divisions.
- The incident may involve multiple operational periods prior to control, which may require a written IAP.
- A documented operational briefing will be completed for all incoming resources and before each operational period. See Briefing Checklist in Resources Section.
- Staging areas or an incident base may be used.

By completing an Incident Complexity Analysis, a county fire warden can assess the hazards and complexities of an incident and determine the specific incident management positions needed (See Northern Rockies Incident Organizer in Resources Section 10.4).

Required training, experience and prerequisites for various wildland fire management positions are contained in PMS 310-1 (Wildland and Prescribed Fire Qualification System Guide). PMS 310-1 has been



# Community Wildfire Protection Plan

## Chouteau County, Montana

adopted by the Northern Rockies Coordinating Group (NRCG) and, consequently, applies to all wildland fire fighting personnel in the state of Montana and Chouteau County for mobilization outside of the county. Within the County, local standards would apply.

Members of the Chouteau County Fire Departments have extensive training and on the ground experience in the wildland fire arena. Over the years, many members of Chouteau County fire organizations have advanced their qualifications to the point where members of the fire organizations are on the MT DNRC County Assistance Team (CAT). This training and experience allows Chouteau County fire organizations to safely and efficiently manage wildland and wildland-urban interface fires for the county. Their experience on the CAT allows representatives of Chouteau County fire organizations to effectively deal with incoming IMT's when they are deployed in Chouteau County.

The level of training of Chouteau County fire organizations allows the Chouteau County fire departments to assist the BLM and the USFS with initial attack efforts on BLM and USFS lands due to occasional shortages of initial attack resources. The County is signatory to an Annual Operating Plan with the Lewis & Clark NF – Judith Ranger District which requires county personnel to meet the PMS 310-1 level of training to fight wildland fire outside their jurisdictions.

The United States Fire Administration and the National Fire Protection Association conducted a needs assessment of the fire service in the United States; one of the findings was that only 26% of the fire departments in the US can handle a wildland-urban interface fire affecting 500 acres with local trained personnel.<sup>8</sup> The Chouteau County fire departments are in those very few fire departments in Montana that can manage such an incident.

### 4.4.2. Law Enforcement

The Chouteau County Sheriff's Department and Fort Benton Police Department provide law enforcement and evacuation services to the city and county. Due to limited resources in the Sheriff's Department, a significant evacuation during a wildland-urban interface fire will be a challenge.

### 4.4.3. Emergency Management

County emergency preparedness comes under the office of the Chouteau County Disaster and Emergency Services. The Chouteau County DES Coordinator has been and continues to be significantly involved in responding to and mitigating wildland fires in the county.

## 4.5. Insurance Ratings

The insurance premiums that residential and commercial customers pay are based on a rating system established by the Insurance Services Office (ISO). In its evaluation of a community, ISO considers the water system and the fire protection provided by the fire department. The relative weight of the components is:

Water Supply	-	50
Fire Department	-	40
Fire Dispatch	-	10

The ISO rating system produces ten different Public Protection Classifications, with Class 1 receiving the most insurance rate recognition and Class 10 receiving no recognition.<sup>9</sup> **A split rating such as Class 6/9 & 10 means that a department is rated as a Class 6 within 1,000 feet of a fire hydrant or certified water point, a Class 9 when over a 1,000 feet from a hydrant and within 5 miles of a fire station, and a Class 10 rating applies when the insured is more than 5 road miles from a fire station.**

<sup>8</sup> A Needs Assessment of the U.S. Fire Service, USFS & NFPA, 2002

<sup>9</sup> Fire Protection Handbook, NFPA 1997



# Community Wildfire Protection Plan Chouteau County, Montana

The majority of Chouteau County currently has an ISO rating of Class 10. However, the county's fire departments have worked to lower their ISO ratings. Individual fire departments ratings are listed in the following table:

## Insurance Services Office Ratings of Fire Departments

Department	Rating
Big Sandy Rural Fire District	Class 6/9
Carter VFC	Class 9
Elim VFC	Class 10
Knees VFC	Class 10
Fort Benton FD	Class 6
Fort Benton RFD	Class 10
Geraldine RFD	Class 8
Highwood RFD	Class 7/9
Loma FD	Class 6/9

Improvements to the water delivery system, dispatch and the fire departments could improve the ISO rating for the individual fire protection agencies. This would result in potential annual insurance premium savings to the fire department's customers, e.g., home and business owners. It is important to note that some insurance companies will not insure structures that are outside of 5 road miles from a fire station.

## 4.6. Land Use/Development Trends

The majority of land use in Chouteau County is agricultural based (See Figure 4 and Land Cover Map in Map Section 10.5).

Currently new land development is at a slow pace; however, subdivision development is occurring in Cascade County immediately adjacent to Chouteau County. Early in 2007, a couple of new subdivisions are proposed in Chouteau County near Highwood.

## 4.7. Air Quality

The State of Montana's air quality is managed by the Montana State Airshed Group through the Department of Environmental Quality. Chouteau County is located in Airshed 9 (See Figure 5). Generally, open burning is permitted year around in the eastern Montana opening burning zone (Airshed 9 and 10), during December,

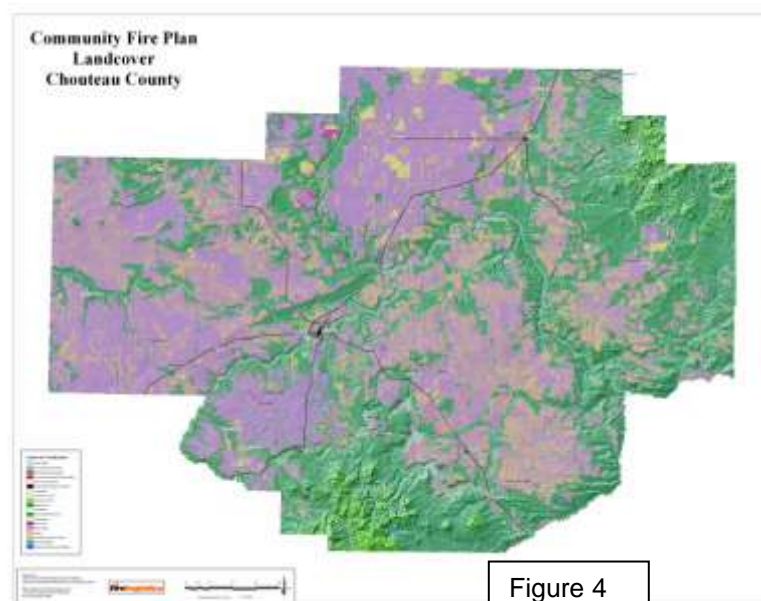
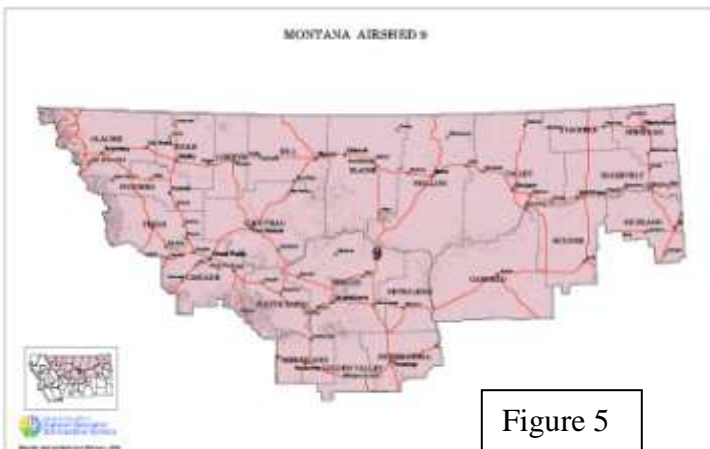


Figure 4



# Community Wildfire Protection Plan Chouteau County, Montana



January, and February the DEQ needs to be notified by telephone of agricultural or prescribed wildland open burning. In most cases this approval can be obtained for any proposed open burning in the eastern Montana zone because of good smoke dispersal and the lack of significant air quality issues such as the valley inversions experienced in western Montana.

## 4.8 Summary

The impacts of the elements of the community have on the wildland fire

program and the delivery of wildland fire fighting services in Chouteau County is summarized in Table 4.8.1.



# *Community Wildfire Protection Plan*

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**Table 4.8.1**

Element	Summary of Impact on Chouteau County's Wildland Fire Program
Topography, Slope, Aspect, Elevation	Accessibility Increased rates of spread
Meteorology, Climate, Precipitation and Fire Weather	Accessibility of water Increased number of high fire danger days Increased flammability of fuels
Population, Demographics	Reduced availability of volunteers Reduced availability of skills and experience Need for increased recruitment and training Need for fire protection planning
Infrastructure	Reduced accessibility
Fire Protection	Lack of fire protection Implementation of local government fire protection services Increased damage from structure fires High cost wildland-urban interface fires
Fire Engine Pump/Draft Source Sites	Accessibility of water
Training, Certification, and Qualification	Availability of personnel Financial Constraints Mitigate potential liability
Law Enforcement	Capacity to deliver evacuation services, security Operational Cooperation
Insurance Ratings	Predictor of service capability Increase or decrease in insurance premiums paid
Land Use/Development Trends	Changing fire protection risk profiles
Air Quality	Ability to conduct prescribed burns



# Community Wildfire Protection Plan Chouteau County, Montana

## 5. Current Fire Environment

The following narratives describe the current fire environment in Chouteau County. These perspectives are a result of an on the ground tour conducted by Chouteau County Fire Warden and Fire Logistics, Inc. personnel in October of 2005.

### 5.1. Wildfire Problem Definition

The Conservation Reserve Program (CRP) land and with the change of agricultural practices, i.e. no-till farming, have created a significant wildland fire problem in the vast majority of the county. As stated in Chapter 4, Chouteau County does have areas of forested land. Ponderosa pine and scattered juniper is the dominant conifer through the largest portion of the forested land in the county. However, the areas



Figure 6

within the Highwood Mountains contain continuous stands of multi-storied Douglas fir, Lodgepole pine and sub-alpine fir. As will be discussed in the next section, these conifer species is a fire prone ecosystem is subject to repeated wildland fires. The impacts of those frequent fires can be quite variable depending on the values at risk (See Figure 6).

Currently, Chouteau County fire departments are responsible for wildland protection on the state and private lands within Chouteau County. The Bureau of Land Management and the United States Forest Service are responsible for providing wildland fire protection on federal lands within Chouteau County. The Rocky Boy Indian Reservation is responsible for wildland fire suppression within the reservation boundaries.

through out Chouteau County indicates that there are wildland engines generally located throughout the areas of the county where fire occurrence is the highest and where there is a willing host (typically a rancher or resident) who will make a commitment to attending required training and respond to wildland fires in the areas and throughout the county.

An analysis of the placement of wildland engines

### 5.2. Wildland Urban Interface

During the past several fire seasons of 2000 through 2003 it has become evident that wildland-urban interface fire losses have increased throughout the Western United States (See Figure 7). The expectation under the Federal Fire Policy is “that losses will increase in the future.”<sup>10</sup>

The wildland-urban interface is defined as the line, area, or zone where structures and other human development meet or intermingle with undeveloped



Figure 7

<sup>10</sup> Federal Fire Policy, 2001



# Community Wildfire Protection Plan Chouteau County, Montana

wildland or vegetative fuels.<sup>11</sup> Similar terms are wildland/residential interface and wildland-urban intermix. For the purposes of this CWPP, “the wildland-urban interface is defined as a group of homes and other structures with basic infrastructure and services within or adjacent to Federal land; in which conditions are conducive to a large scale wildfire event; and for which a significant threat to human life or property exists as a result of a wildland fire disturbance event.”<sup>12</sup>

From a fire fighter’s perspective there are nine Wildland-Urban Interface “Watchout” Situations that are significant to the safety of wildland fire fighters:

- Wooden construction and wood shake roofs
- Poor access and narrow congested one-way roads
- Inadequate water supply
- Natural fuels closer than 30 feet to structures
- Extreme fire behavior
- Strong winds
- Need to evacuate the public
- Structures located in chimneys, box or narrow canyons, or on steep slopes in flashy fuels
- Inadequate bridge load limits

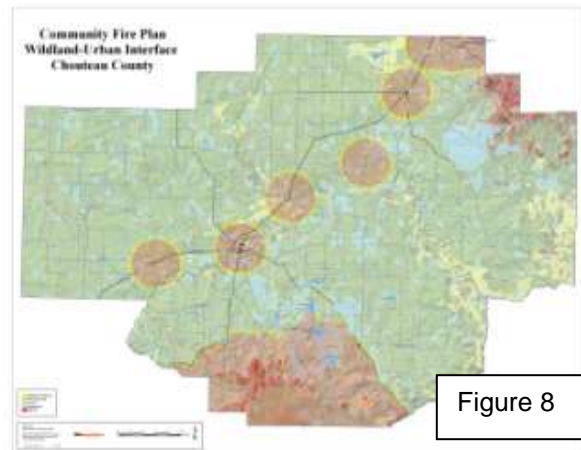
Chouteau County communities that are listed in the Federal Register as “Communities at Risk” from wildland fire include:

- Geraldine
- Square Butte
- Duck Creek Drainage
- Boxelder Creek

There are several additional areas of wildland-urban interface within the county, which have been identified during this planning process (See Figure 8 and Wildland-Urban Interface Area Map in Map Section 10.5).

Additional areas of wildland-urban interface in Chouteau County include:

- Highwood, the Highwood Mountains and associated areas
- Carter\*
- Fort Benton\*
- Loma\*
- Big Sandy\*



\*At risk from a rangeland or CRP fire.

The potential development of portions of southwest Chouteau County into residential lots of varying sizes will contribute to the wildland-urban interface fire problem for the fire protection agencies in the county. This leads to several complex problems, which need to be addressed in the CWPP:

- Access
- Asset Protection Zones
- Water Supply
- Building Construction Requirements
- Fuel Reduction On All Ownerships

<sup>11</sup> *Ibid.*

<sup>12</sup> Healthy Forest Restoration Act





## *Community Wildfire Protection Plan* *Chouteau County, Montana*

- High costs of wildland fires when the structure protection resources need to be acquired from other areas of the state.
- Kinds And Types Of Fire Apparatus Required For Fire Protection

### **5.3. Structure Fire Problem Definition**

Currently, Fort Benton Fire Department, Geraldine RFD, and Big Sandy RFD have fire protection responsibilities for all structure protection within the incorporated city limits. These departments plus the Highwood RFD, Loma FD, Elim, Knees and Carter VFC's provide structure protection for structures within the county. Essentially the entire county is covered for structural fire protection and only Elim VFC does not have any structural fire apparatus.

The best way to quantify the structure fire problem in the Chouteau County outside of the city limits is to conduct an occupancy risk assessment, which evaluates the severity of a specific structure in relation to the fire districts ability to handle the types and severity of emergencies with that structure.<sup>13</sup> Risk categories used in the Self-Assessment Manual developed by the International Commission on Fire Accreditation are:<sup>14</sup>



<sup>13</sup> Fire and Emergency Service Self-Assessment Manual, Commission on Fire Accreditation International, 6<sup>th</sup> ed.

<sup>14</sup> Ibid



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Category	Description
Maximum/Worst Risk	Occupancies classified as maximum risk will be of substantial size and contain a concentration of properties, which present a very high risk of life loss, loss of economic value to the community or large loss damage to property in the event of a fire. These risks impact the need for the fire department to have multiple alarm capability and have an adequate assessment of their ability to concentrate resources.
High Hazard/Key Risk	Built-up areas of substantial size with a concentration of property presenting a substantial risk of life loss, severe financial impact on the community or unusual potential damage to property in the event of fire.
Moderate/Typical Risk	Built up areas of average size, where the risk of life loss or damage to the property in the event of a fire in a single occupancy is usually limited to the occupants. In certain areas, such as small apartment complexes, the risk of death or injury may be relatively high. The moderate/typical risks are often the greatest factor in determining fire station locations and staffing due to the frequency of emergencies in this category. To assure an equitable response and to provide adequate initial attack/rescue capability to the majority of incidents, the typical risk is often used in determining needed resources.



**Maximum/Worst Risk**



Chouteau County fire agencies have similar risks located throughout the county. As demonstrated by the grain elevator fire in Geraldine in 2001, a heavy commitment of mutual aid resources and long duration incidents are required for incidents in these maximum/worst risks.

**High/Key Risk**



**Moderate/Typical Risk**





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The Commission on Fire Accreditation International, *Fire and Emergency Service Self-Assessment Manual* outlines the needed staffing levels for incidents occurring in the different types of risk occupancies, which are detailed in the following table.<sup>15</sup>

### Staffing Resources for Risk Type Occupancies.

Task	Maximum/ Worst Risk	High Risk	Moderate Risk	Low Risk
Attack Line	4 (16-18*)	4	2	2
Search and Rescue	4	2	2	
Ventilation	4	2	2	
Back-up-Line	2	3	3	1
Pump Operator	1	1	1	
Water Supply	1	1	1	
Utilities Support	1	1	1	1#
Command/Safety	2	2	1	
Forcible Entry	*			
Accountability	1			
Salvage	*			
Overhaul	*			
Communication	1*			
Chief's Aid	1	1		
Operations Officer	1			
Administration	1			
Logistics	*			
Planning		1*		
Staging		1*		
Rehabilitation	1			
Sector Officers	1-4*			
High-Rise Evacuation	10-30*			
Stairwell Support	10*			
Relief	*			
Investigation	*			
<b>TOTALS</b>	<b>25-65*</b>	<b>17</b>	<b>13</b>	<b>3-4</b>

# Can often be handled by the first due officer.

\* At maximum and high-risk fires, additional fire fighting personnel are needed

Structural fire suppression whether in a rural environment or in one of our cities requires the accomplishment of the above listed tasks, many of which must occur almost simultaneously to ensure effective and safe operations at the incident scene. To ensure an effective fire fighting force on the scene of significant fires in these kinds of risks, current staffing levels need to be augmented with paid-call fire fighters, volunteers and mutual aid from other fire departments.

A principal difference between rural fire departments and their municipal counterparts is that the rural departments must typically solve water supply issues, in addition to fighting the fire. Typical rural departments incorporate water tenders, portable tanks, draft points, etc. into their fire protection strategies for rural areas of Chouteau County.

To be minimally effective in controlling a structure fire, the initial responding apparatus should reach the scene of the structural fire before “flashover” occurs.<sup>16</sup> The time from ignition to flashover varies based on the materials involved in the fire, but generally occurs somewhere between 4 and 10 minutes. The following chart illustrates the relationship between the response time or reflex time and flashover and/or

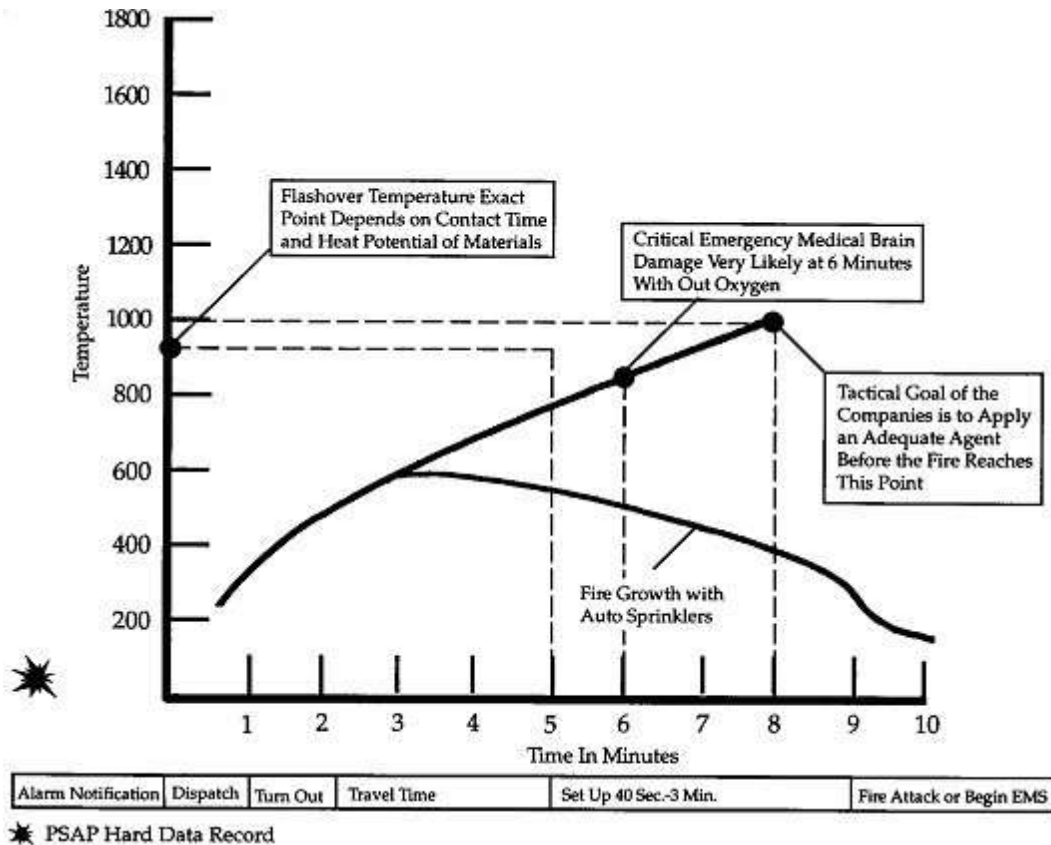
<sup>15</sup> *Fire and Emergency Service Self-Assessment Manual, Commission on Fire Accreditation International, 6<sup>th</sup> ed.*

<sup>16</sup> *Evaluation & Planning of Public Fire Protection, John Granito*



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critical brain damage in an EMS incident.



## The Significance of Flashover

### Pre-Flashover

- Limited to one room
- Requires smaller attack streams
- Search & Rescue is easier
- Initial assignment can handle

### Post-Flashover

- May spread beyond the room of origin
- Requires more larger attack lines
- Search and Rescue is difficult
- Requires additional fire companies

For municipal departments in small and medium sized cities, all of the first alarm apparatus will not arrive at the fire scene simultaneously. For the departments in Chouteau County, the typical scenario requires the volunteer fire fighters to be paged, the fire fighters either respond to the station or directly to the incident, if they respond to the station, then they don their personal protective equipment, board the apparatus and respond to the scene of the incident.

There is currently a written mutual aid agreement between all of the fire agencies in Chouteau County. In Chouteau County, as in many areas of the country, fire services agencies are now transcending the traditional fire service hierarchy and geopolitical boundaries to meet increased service demands and



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reduce expenditures.<sup>17</sup>

### **5.4. Local Fire Ecology**

The fire ecology of the forest and grassland habitat types is an integral part of the changing dynamics of the fuel conditions. By understanding fire's role within these plant communities coupled with the knowledge of the extent of the conservation reserve program (CRP) and potential subdivision development, one can further understand the present day risks.

A method of placing various forest and grassland habitats type into fire groups is commonly used to determine response of vegetation to fire and the path certain species take during succession. Fire groups describe the natural role of fire following a sequence from low to high elevation vegetative categories (Fisher, et. al. 1983). They paint an average picture of fire intensities and frequencies, and describe the natural role of fire prior to active fire suppression efforts. Fire groups correlate directly to Pfister's Habitat Types of Montana (1977), in how they respond to fire disturbance, and are grouped in this analysis based on vegetation similarities.

#### **FORESTED ECOLOGY**

There are a number of conifer species that have adapted to the ecology of Chouteau County, with the most prevalent timber type being ponderosa pine. Douglas fir and lodge pole pine are present in the county, but located predominately in the Highwood Mountains and some scattered northern aspects.

The ponderosa pine type is a fire adapted tree species that has developed natural mechanisms to cope with frequent fire. It has a thick corky bark that insulates the tree's cambium from heat generated by wildland fires. The cambium is the living layer of cells between the bark and the woody portion of the tree stem and is responsible for the growth of both new wood and new bark. Ponderosa pine can be found on isolated dry sites such as those found in Chouteau County. Because of the frequency of lightning storms in the county, it is estimated that fire burned in and under most of the natural pine stands at a 10-20 year interval and less than that in some areas. Because of this frequency fuel loadings were traditionally low in the stands as dead branch wood and needle litter were consumed during these fire events. The fires also tended to thin out patches of heavy regeneration that resulted from good cone crop years and favorable moisture conditions. The fires kept the density of trees lower by selectively killing some of the thinly barked seedlings and smaller individual trees. The trees that did survive had a greater supply of nutrients and water to nourish them and were stronger and healthier. In the absence of the heavy fuel loadings, periodic low intensity fires would have had no significant impacts on the older trees that remained.

Since the advent of fire protection, however, the situation has changed considerably. The natural litter occurring from the trees in these stands has accumulated for decades. In most areas there are many more trees per acre than there would have been historically. There are also more situations where continuous fuel exists from the ground to the crowns of mature trees (ladder fuels). This results when too many seedlings survive and, because of intense competition for water and nutrients, form overcrowded pockets of spindly trees. These trees will survive to intermediate heights with many of them bent or broken by snow loads.

Today, when a wildland fire occurs it is much more likely to have greater negative consequence. The higher fire intensity caused by a greater amount of fuel, results in an increased amount of heat. This increased heat can have adverse effects on the soil and, subsequently, the productivity of the site. Higher intensity fires are also more difficult to keep away from improvements landowners and fire fighters wish to protect. Most importantly, they increase the risk to fire fighters.

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<sup>17</sup> Klamath County Fire District No. 1 Deployment Process, 2000



# Community Wildfire Protection Plan Chouteau County, Montana

Four timber fire groups are represented in Chouteau County: Dry ponderosa pine, Cool Dry Douglas fir, Moist Douglas fir and cool habitats dominated by lodgepole pine. The following will describe the fire ecology of each type and how fire plays a role.

## Warm, Dry Ponderosa Pine

This Group consists of ponderosa pine stands with predominantly grass undergrowth. Dense ponderosa pine understories often develop beneath scattered overstory trees on some Group Two sites. Fires that start in such stands often burn vigorously in the crowns of the understory trees. Consequently, fast spreading, severe fires result despite relatively light down and dead fuel loadings (See Figure 8).

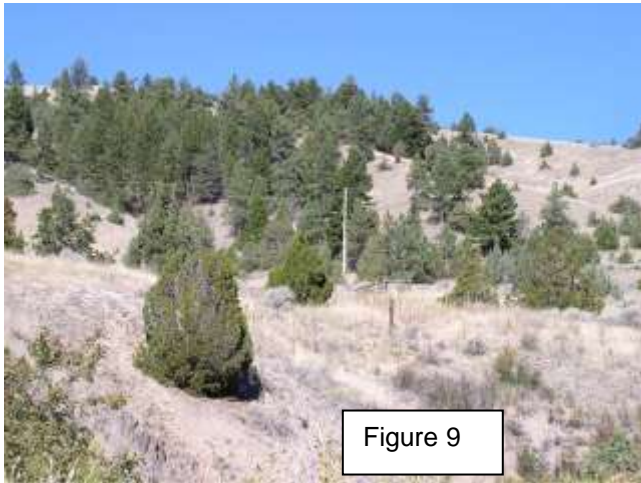


Figure 9

Numerous fire history studies conducted in the ponderosa pine forest types throughout the western states have shown fire to have been a frequent event, occurring at intervals from 5 to 25 years in most locations. These low intensity surface fires maintained a more open stand of trees and removed much of the understory helping to prevent the development of a stand destroying crown fire. Successful fire control during the 20th century has undoubtedly affected some Group Two stands. A primary effect is the increased presence of two-storied stands on some sites where the understory is a dense stand of pole-sized or larger trees. When fire control eventually fails in such stands, large, severe fires often result.

## Cool Dry Douglas fir

This group exists on dry sites that are generally too dry for lodgepole pine and too cold for ponderosa pine. Rocky Mountain Juniper, limber pine, and sub-alpine fir can be found as minor species within these stands. This fire group includes big sagebrush, common juniper, wax currant, russet buffaloberry, white spirea, and mountain snowberry (See Figure 10).

Downed dead fuel loads for this group average 10 tons/acre. While downed, dead woody fuel loading can, at times, be significant, live fuels are less of a problem, due to the harsh site conditions. This factor plus the usual open nature of these stands results in a low probability of a crown fire. Individual trees will often have branches close to the ground and if sufficient ground fuels are available, torching can occur.

The role of fire in this fire group is not well defined. Fire probably occurred less frequently than in the warmer Douglas fir habitat types.



Figure 10



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The relatively light fuel load, sparse undergrowth, and generally open nature of the stands would appear to favor a long fire-free interval. However, fire history studies have estimated a fire interval of 35 to 40 years (Arno and Gruell, 1983).

Fire plays an important role in favoring ponderosa pine within this group. Without fire, Douglas fir would slowly replace ponderosa pine. Fire's role in seedbed preparation on most of these fire group sites is confounded by the difficulty of regeneration beyond the seedling stage on these droughty sites because of undergrowth and overstory competition. Where dense regeneration does occur, fire probably played a role as a thinning agent in sapling and pole-sized stands. Ground fire probably maintains many mature stands in an open, park like condition. Many pre-settlement stands were actually scattered groves. Modern fire suppression has allowed these groves to become more dense forest stands.

Opportunities for wildland fire use may be limited in some stands in this group, due to the normally sparse fuels. Where sufficient surface fuels exist, prescribed fire can be used to accomplish timber, range and wildlife management objectives.

Fire can be used following timber harvest activities to prepare the seedbed and to reduce wildland fire hazards from the harvest related slash. Care needs to be taken in managing the fire intensity when prescribed burning in partial-cut stands. The hazard reduction objective in these situations should be only to remove the fine fuels. Burning under moist conditions is recommended.

### Moist Douglas fir

This group exists at elevations ranging from 4,800 ft. to 7,200 ft. Douglas fir is both the indicated climax species and a vigorous member of seral communities. It is not uncommon for Douglas fir to dominate all stages of succession on these sites. Lodgepole pine is a major seral component in many stands. Whitebark pine is usually well represented at higher elevations (See Figure 11).

Shrubs and moist forbs dominate the undergrowth along with pine grass, bear grass, and elk sedge. Common shrubs include ninebark, snowberry, white spirea, oceanspray, blue huckleberry, grouse whortleberry, kinnikinnick, twinflower, and common juniper.

Downed dead fuel loads average 13 tons/acre, but can often be much heavier. Fuel conditions will vary according to stand density and species composition. The most hazardous fuel conditions occur in well-stocked stands with dense Douglas fir understories. These stands are usually characterized by relatively large amounts of downed twigs and small branch wood less than 3 inches in diameter beneath partially fallen and standing dead sapling and small pole-sized stems.

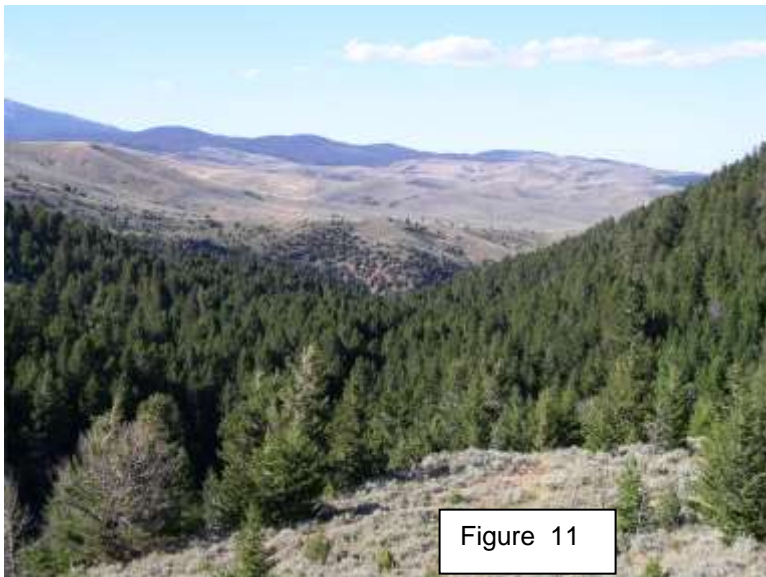


Figure 11

The absence of a dense understory results in a reduced fire hazard. However, the density of overstory trees and the presence of dead branches near ground level, create ladder fuels leading to crown fire potential under severe burning conditions.



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Fuel conditions in stands dominated by lodge pole pine tend to be less hazardous than in stands dominated by Douglas fir. Ladder fuels are much less prevalent, so the probability of fire going from the forest floor to the crown is not as great.

The tendency toward overstocking and the subsequent development of dense understories is the main reason for high-hazard fuel conditions in many of these stands. Fuel accumulation due to fire suppression, natural mortality, snow breakage, blow down and insect and disease mortality are at a high level in many stands. Relatively deep duff develops and contains a lot of rotten logs. Fires may often sit and smolder undetected in the duff until burning conditions become favorable for fire spread, resulting in a large acreage being burned.

Historically, fire was important as a thinning agent and as a stand replacement agent. Low to moderate severity fires converted dense pole-sized or larger stands to a fairly open condition. Subsequent light burning maintained stands in park like conditions. Severe fires probably occurred in dense, fuel-heavy stands and resulted in stand replacement. Fire's role as a seedbed-preparing agent is less important in this group than in dry Douglas fir.

Fire has a demonstrable effect on wildlife habitat through its effect on food plants. The combination of opening up stands by killing overstory trees, reducing competition by removing understories, and rejuvenation of sprouting plants through top kill, can significantly increase the availability of palatable browse and forage.

Fire's role as a stand replacement agent becomes more pronounced when the natural fire-free interval is increased through fire suppression, unless corresponding fuel reduction occurs. Stands within this group are quite variable depending on site conditions, stand history, and successional stages. Fire management considerations must, therefore, be attuned to this variation. Protection from unwanted fire may be a major fire management consideration in those stands where combinations of live and dead fuels result in severe fire behavior potential. It may be difficult and impractical to abate the fire hazard in such stands except in conjunction with a timber harvest operation. Pre-attack planning coupled with rapid detection and initial attack may be the only reasonable means to deal with this situation until such time as harvest operations can be scheduled.

### **Cool Habitat Types/Lodgepole Pine**

Fire group 7 contains two groups of habitat types. The first consists of lodgepole pine climax series habitat types that support essentially pure stands of lodgepole pine (See Figure 12). The second group consists of those Douglas fir, spruce, and subalpine fir habitat types that, regardless of potential climax species, are usually found in nature supporting lodgepole pine dominated stands. These stands seldom reach a near climax condition. Periodic wildfires seem to recycle the stand before a substantial amount of mature lodgepole pine dies out. Subalpine fir, spruce, Douglas fir and whitebark pine occur in varying amounts with



Figure 12





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lodgepole pine in most of these habitat types.

Undergrowth in this group often consists of dense mats or layers of grasses or shrubs. The most common graminoid species are pinegrass, bluejoint, and elk sedge. Common shrubs include grouse whortleberry, blue huckleberry, dwarf huckleberry, myrtle whortleberry, twinflower, kinnikinnick, white spirea, bunchberry dogwood, snowberry, common juniper, bitterbrush, buffaloberry, and Oregon grape.

The average downed dead woody fuel load in this group is 15 tons/acre, but maximum loads may greatly exceed this value. This group's fuel load is characterized by relatively large amounts of material 3 inches and larger.

Live fuels in this group can be a problem. The primary live fuel consideration is related to the occurrence of dense patches or entire stands of young lodgepole pine with intermingled crowns and lower branches extending down to the surface fuels. When ignited under favorable burning conditions, such stands are can be destroyed in a few minutes.

Densely stocked, clean-boled trees characterize many mature stands with large amounts of deadfall on the forest floor. An immediate source of deadfall in a young lodgepole pine stand is the snags created by a previous fire.

The role of fire in the seral lodgepole pine forest is almost exclusively as the agent that perpetuates or renews lodgepole pine. Without periodic disturbance, the shade-tolerant species replaces the lodgepole pine because it does not regenerate well on duff or under shaded conditions. Fire interrupts the course of succession and increases the proportion of lodgepole with each burn. Within 50 to 100 years following a severe fire, a lodgepole pine forest will exist even though shrubs and herbaceous cover may become dominant immediately following the burn.

Large stand replacement fires play a definite role in the ecology of lodgepole pine forests. The natural range of fire in seral lodgepole pine stands runs from less than 100 years to about 500 years. The interval between any two fires in one area might be only a few years. Recurring cool fires may thin a stand or otherwise rejuvenate it without doing serious damage. Stands greater than 60 to 80 years old, however, become increasingly flammable due to overcrowding. Eventually an ignition sets off a major conflagration. In certain areas such a stand replacement fire can cover thousands of acres. Vast tracts of lodgepole can develop in this way as the serotinous cones open and shower the burn with seeds.

The exclusive dominance of lodgepole pine in the lodgepole community types is attributed in a large part to fire for the following reasons:

1. Historic repeated wildfires over large areas may eliminate seed sources of potential shade-tolerant competitors.
2. Light ground fires may remove invading shade-tolerant competitors from the understory.
3. Dense stands may prevent regeneration of all conifers for up to 200 years in the absence of disturbance or stand deterioration.
4. Sites may be unfavorable for the establishment of other conifers.

The primary fire management consideration in this group's habitat types is protection from unwanted fire during extended periods of drought and during severe fire weather conditions. Stand replacement fires at such times often crown and become catastrophic, resulting in complete stand mortality.

Opportunities for use of prescribed fire are limited in natural stands because of the low heat resistance of lodgepole pine, spruce and subalpine fir. The other problem is that burning during conditions that would allow for low fire intensities, make it difficult to sustain a prescribed fire in these stands.



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## RANGELAND ECOLOGY

Rangeland and the ecology of the plant species that occupy these sites have their own relationship to wildland fire. The grass species can be a contributor to fire behavior, but can easily be modified through agricultural practices, such as grazing (Bunting, Kilgore, Bushey, 1987).

The sagebrush grass range is fairly extensive within the county. Silver Sagebrush is the predominate species. Silvertip Sagebrush dominates areas within the county. It is a noted sprouter but apparently can be controlled by fire in some areas of its range. Other authors refer to Silvertip Sagebrush as an occasional re-sprouter following fire. In some instances it re-sprouts vigorously following spring burns, but fall burns result in greater mortality and low vigor of sprouts.

Many species of nature grasses abound within the county. With proper range management practice these grasses provide outstanding grazing opportunities for range animals and wildlife. Areas of grasses that are absent from grazing find that over time they become rank and provide little for forage and present a significant danger from wildfire.

## 5.5. Hazardous Fuels

As displayed in Figure 13 (See Land Cover Map in Map Section 10.5) the continuity of heavy fuels, i.e. Douglas fir, ponderosa pine, subalpine, and lodge pole pine is concentrated in the Highwood Mountains. Scattered stands of ponderosa pine and juniper dominate the wooded coulees interspersed between the agricultural tracts in Chouteau County. There are areas of continuous coniferous fuels covering several thousand acres in size and these are the areas that have the greatest potential for supporting large intense fires. Fires may be terrain driven, plume dominated, or wind driven in this fuel type.

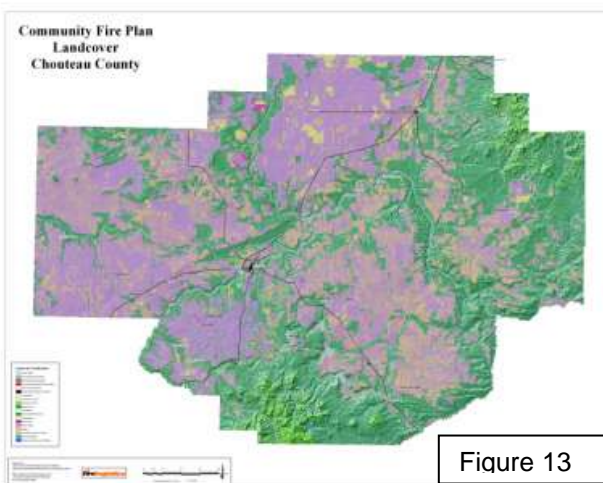


Figure 13

Areas of sage and brush species also have potential for large intense fires but they are less likely except under wind driven conditions. There are many thousands of acres of this fuel type in the county.

The most common fuel type in Chouteau County is grassland which includes a significant amount of CRP. Some of the CRP land has been enrolled in the program for approximately 20 years. Fires in the grassland type will exhibit significant fire behavior which includes high intensity fire behavior that are not easily controlled.

### 5.5.1. Fire Regime Condition Class

To best understand hazardous fuels ranking, a definition system called “vegetative condition class” is one approach to define and interpret the importance of fire frequency in the ecosystem. Current “Condition Class” is defined in realms of departure from the historic fire regime, as determined by the number of missed fire return intervals. Fire has always been a part of the wildland, changing and shaping the structure and composition of vegetation in the area. The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes are:

I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the



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dominant overstory vegetation replaced);

II – 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);

III – 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced);

IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);

V – 200+ year frequency and high (stand replacement) severity.

All of the wildland-urban interface areas in the Chouteau County were historically maintained by fire. Because of the predominance of fire dependent tree species on these sites, fire helped maintain them. Low intensity surface fires burned, keeping ground vegetation from becoming ladder fuels. As fire became less of a factor (fire suppression) in maintaining the vegetation in these areas, the vegetation changed. As a result, there are more vegetation and ladder and ground fuels (litter mat and down woody material) that contribute to higher intensity fires than occurred historically. This has increased the risk, hazards and threats to people and human resource values within the wildland-urban interface.

Current “Condition Class” is defined in realms of departure from the historic fire regime, as determined by the number of missed fire return intervals. There are three “Condition Classes” that have been developed to categorize the current condition with respect to each of the historic fire regime groups.

The following table describes each Condition Class:

Fire Regime Condition Class	Description	Potential Risks
Condition Class 1	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) are low
Condition Class 2	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate; Risk of loss of key ecosystem components are moderate
Condition Class 3	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components are high

The timbered portions of the county can be considered to fall into Condition Classes 2 and 3.



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The areas of grass and brush that are managed for agricultural purposes can be considered class 1. Those areas that are not managed or are held within the CRP programs fall well outside the natural regime for the natural fire cycle and could be considered to fall into Condition Class 2.

## 5.5.2. Natural Fire Breaks

Other than the county's transportation system, irrigated agricultural uses, and the Missouri River, the Teton River, and the Marias River, there are few breaks in the fuels in Chouteau County. Grazing is probably one of the best fuel management tools available for rancher and in many cases provides an anchor point to initiate wildland fire suppression activities.

## 5.6. Fire History

The fire history for Chouteau County began long before European settlement advanced into Montana. Data from the Tenderfoot D area, as well as some from the greater Yellowstone ecosystem (Barrett 1973, Fire History of Tenderfoot Creek Experimental Forest) indicate that large fires occurred during severe droughts in the early to mid-1600's.

Some of the worst droughts and severe fire years in the Pacific Northwest occurred between the late 1800s and the 1930s. However, fire scar and fire atlas data for the Lewis and Clark National Forest indicate a general decline in large wildland fires beginning as early as the late 1800's. Fire scar samples suggest that these large fires occurred on an average of every 2 or 3 decades during the pre-European settlement era.

Since European settlement began in the county during the late 1800's, large fire occurrence has been significantly decreased. These changes were the direct result of homesteading and grazing from sheep and cattle modified the fuel complexes to the extent that the sizes of the fires in this ecosystem were reduced significantly.

Beginning in the late 1980's and continuing through 2006, Chouteau County has been under a long-term drought. Due primarily to the drought impact on fuels, the county has experienced a number of significant large wildland fire events. Years of significant fire activity were: 1988, 1996, 1998, 1999, 2000, 2002 and 2003.

## 5.7. Expected Fire Behavior

Fire behavior describes the way fires ignite and spread. Topography, fuel conditions, and weather all influence fire behavior and how wildland fires burn in Chouteau County. Fuel is the only factor influencing fire behavior that we have the ability to manage. The following fire behavior assessment shows fire intensities and fire spread rates in different fuel types/models that are found in Chouteau County. It is important to understand this information to determine what areas contribute to the fire problem in the county (See Figure 14 and Behave Fire Model Map in 10.5).

The following fuel types/models were used for analyzing potential fire behavior:

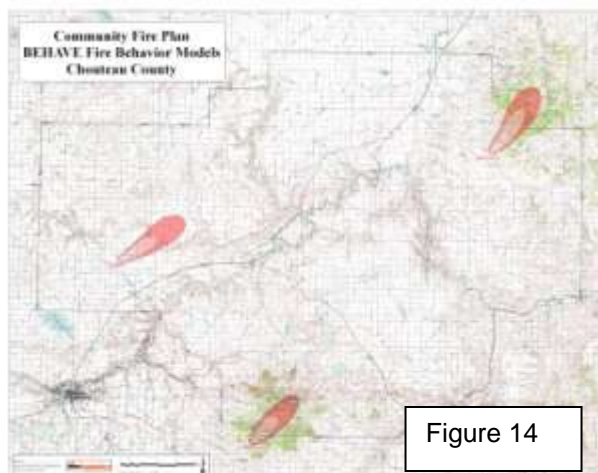


Figure 14



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**Fuel Model 1:** Grass that dominated by short grass where very little shrubs or timber is present over less than  $\frac{1}{3}^{\text{rd}}$  of the area. The fine, porous, and continuous fuels that have cured or are nearly cured govern fire spread.

**Fuel Model 2:** Grass with open timber overstory that cover  $\frac{1}{3}^{\text{rd}}$  to  $\frac{2}{3}^{\text{rd}}$  of the area. This model represents the open grass and ponderosa pine and harvested areas where an overstory of timber remains. Fire spread is primarily by a surface fire through the curing or dead grasses with the litter and dead down wood from the open shrub or timber overstory contributing to fire intensity. This fuel model also includes scattered sagebrush within grasslands without ponderosa pine overstory.

**Fuel Model #4: (This fuel model has more nearly represented the dense, continuous stands of ponderosa pine and Douglas-fir regeneration in this area).** Fire intensity and fast-spreading fires involve the foliage and live and dead fine woody material in the crowns of a nearly continuous understory of ponderosa pine and/or Douglas-fir regeneration. Besides flammable foliage, dead woody material in the stands significantly contributes to the fire intensity. A deep litter layer may also hamper suppression efforts.

**Fuel Model #6:** This model represents the area around the Bears Paw Mountains. Fires are carried through the shrub layer where foliage is more flammable than fuel model 5, but requires a wind greater than 8 mph. Fire will fall to the ground without a wind and the shrubs are not as tall as described in fuel model #4.

**Fuel Model #9: (This fuel model can represent some stands of dense ponderosa pine overstory in our area).** Fires run through the surface litter faster than model 8 and have longer flame heights (due to the sometimes dense layer of ponderosa pine needles). Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning.

Fire behavior calculations for these fuel models were made using the fuels, weather, and topographic conditions prevalent for Chouteau County. One is for normal August fire season conditions, called Average, and one for extreme August fire season conditions, called Extreme. The extreme case also takes into consideration severe drought conditions. These conditions would be present in August and September when all the vegetation has cured and dried.

## **WEATHER**

The weather that led to the extreme burning conditions in 1988 and 2000 started with drought conditions the previous fall. A low snow pack combined with warm, dry springs and hot, dry summers, led to very low fuel moistures and severe fire seasons during these years. The 1990 fire season was characterized by an extended dry fall. High wind associated with the passage of dry frontal systems added to the spread of the large catastrophic fires of 1988, 1990, and 2000. A repeat of these conditions can and will be experienced when similar weather conditions exist.

The following weather parameters were used representing severe August burning conditions in this area.



# Community Wildfire Protection Plan

## Chouteau County, Montana

	Time of Day		
	1400 – 1700 hours	1700 – 2200 hours	2200 – 0200 hours
Air Temperature	80-89	70-79	50-59
Humidity	10 – 14%	15 – 19%	20 – 24%
20 foot wind speed	30 mph*	20 mph*	20 mph*
Mid-flame wind speed	9 mph	6 mph	6 mph

\*Wind reduction factor of .3 for partially sheltered stands is used.

Critical level fuel moisture inputs for surface fuel models are:

- One hour time lag dead fuel <1/4 inch diameter
- Ten hour time lag dead fuel 1/4 to 1 inch dia.
- One hundred hour dead fuel 1 in. to 3 in. dia.

Typical Fuel Moisture Inputs for Critical Fire Weather			
	1400 – 1700 hours	1700 – 2200 hours	2200 – 0200 hours
One Hour Fuels	4%	6%	6%
Ten Hour Fuels	6%	6%	7%
Hundred Hour Fuels	8%	8%	8%
Live Woody Fuel Moisture	70%	70%	70%

Other inputs are

- |                                 |                    |
|---------------------------------|--------------------|
| Fuel Model 1 = 0-15 % slope     | Fuel Shading = 0%  |
| Fuel Model 2 & 4 = 15-30% slope | Fuel Shading = 45% |
| Fuel Model 9 = 30% slope        | Fuel Shading = 85% |

Fire behavior calculations were made using the BEHAVE Fire Modeling System, Andrews and Chase, USFS, General Technical Report INT-194, for surface fires, and Predicting Behavior and size of Crown Fires in the Northern Rocky Mountains, Rothermel, USFS, General Technical Report INT-438.

For Crown Fire Calculations, Rothermel’s models for Drought Summer and Severe Drought-Late Summer were used. These conditions would be present normally after early August during periods of drought when all the vegetation had cured and dried and was available to be consumed by fire.



# Community Wildfire Protection Plan Chouteau County, Montana

<b>FIRE BEHAVIOR PROJECTIONS FOR CRITICAL AUGUST FIRE WEATHER</b>				
	Fuel Model 1	Fuel Model 2	Fuel Model 4	Fuel Model 9
	Rate of Spread			
1400 – 1700	345 chains/hr	149 chains/hr	245 chains/hr	29 chains/hr
	4.3 mph	1.9 mph	3.1 mph	.4 mph
Flame Length	8.6 feet	12.8 feet	35.4 feet	5.4 feet
Fire line Intensity	607	1,444	13,241	219
1700 – 2200	136 chains/hr	66 chains/hr	131 chains/hr	13 chains/hr
	1.7 mph	0.8 mph	1.6 mph	0.2 mph
Flame Length	5.4 feet	8.5 feet	25.7 feet	3.5 feet
Fireline Intensity	225	600	6,660	87
2200 – 0200	117 chains/hr	60 chains/hr	122 chains/hr	11 chains/hr
	1.5 mph	0.75 mph	1.5 mph	0.1 mph
Flame Length	4.9 feet	8.1 feet	24.4 feet	3.2 feet
Fireline Intensity	179	536	5,877	70

\* Critical fireline intensity and minimum flame length has been estimated for initiation of crown combustion dependent upon height to live crown. Typical height to the live crown base in the area of concern is approximately 5 to 20 feet. Conditions favorable for initiation of a crown fire are estimated at 59 BTU/ft/s fireline intensity and 2.9 foot flame lengths for a height to live crown of 5 feet. For a 20 foot height to live crown, 174 BTU/ft/s fireline intensity and 7.7 foot flame lengths would be required. This would indicate that crown fires could be initiated in all the timbered Fuel Models under the weather conditions described. Once a crown fire is initiated potential fire behavior can be estimated utilizing Rothermel's crown fire models. When spotting is possible, the Probability of Ignition where the firebrand lands must also be considered. Using the air temperature of 80 - 89 F. and a fine fuel moisture of 4%, the Probability of Ignition in Fuel Model 2 is 75%. This means that there is a 75% chance that a firebrand will start a spot fire if it lands in a receptive fuel bed.

In most case wildland fires ignite and burn under conditions that are not critical in natural and can be suppressed by wildland fire suppression forces. The following charts provide information that relates to fires burning under “normal” circumstances. Normal means the average or typical August climatic and fuel moistures.

These charts are just one of a number of scenarios that can be developed thru the BEHAVE fire behavior modeling process and should only be used as a reference.

The following weather parameters were used representing typical August burning conditions in this area.



# Community Wildfire Protection Plan Chouteau County, Montana

	Time of Day		
	1400 – 1700 hours	1700 – 2200 hours	2200 – 0200 hours
Air Temperature	70 – 79	70-79	50 -69
Humidity	25 – 29%	25 – 29%	30 – 34%
20 foot wind speed	5 mph*	5 mph*	Calm
Mid-flame wind speed	1.5 mph	1.5 mph	Calm

\*Wind reduction factor of .3 for partially sheltered stands is used.

Live Fuel Moisture Inputs for Typical Fire Weather			
	1400 – 1700 hours	1700 – 2200 hours	2200 – 0200 hours
One Hour Fuels	6%	8%	10%
Ten Hour Fuels	8%	8%	9%
Hundred Hour Fuels	10%	10%	10%
Live Woody Fuel Moisture	100%	100%	100%

The same slope and fuel shading is used as in the critical fire weather simulation.

<b>FIRE BEHAVIOR PROJECTIONS FOR TYPICAL AUGUST FIRE WEATHER</b>				
	Fuel Model 1	Fuel Model 2	Fuel Model 4	Fuel Model 9
	Rate of Spread			
1400 – 1700	12 chains/hr	11 chains/hr	22 chains/hr	3 chains/hr
	0.15 mph	0.14 mph	0.28 mph	0.04 mph
Flame Length	1.8 feet	3.7 feet	11 feet	1.8 feet
Fire line Intensity	19	96	1,035	21
<hr/>				
1700 – 2200	3 chains/hr	5 chains/hr	8 chains/hr	2 chains/hr
	0.12 mph	0.12 mph	0.25 mph	0.04 mph
Flame Length	1.6 feet	3.5 feet	10.5 feet	1.6 feet
Fireline Intensity	16	86	944	17
<hr/>				
2200 – 0200	3 chains/hr	5 chains/hr	8 chains/hr	2 chains/hr
	0.04 mph	0.06 mph	0.10 mph	0.02 mph
Flame Length	0.7 feet	2.5 feet	6.7 feet	1.3 feet
Fireline Intensity	3	40	358	10





# Community Wildfire Protection Plan Chouteau County, Montana

Normal fire behavior under typical conditions for this area will usually result in wildland fires of low to moderate intensities that can be successfully suppressed. Some of these fires may exhibit torching, short crown fire runs, and spotting during the afternoon burning period. However, large, high-intensity fires exhibit some common characteristics. They normally occur during drought conditions when fuels are cured and very dry and there is continuous source of forest fuels. The prevailing wind usually pushes these fires in a northeasterly direction. These winds are associated with frontal passages. They can be quite strong and are from the south, southwest, and west. This direction of primary spread is very evident with all major fires in the Northwest. High intensity crown fires typically cause long range spotting, burn rapidly both up and down slopes, at times both day and night, and are essentially "uncontrollable". **It is this kind of fire that is of most concern to residents and fire fighters in the wildland-urban interface.**

The following table is the fire behavior interpretations that should be used for the fire behavior outputs.

## Fire Suppression Interpretations from Flame Length

<u>Flame Length</u>	<u>Fireline Intensity</u>	<u>Interpretations</u>
< 4 feet	< 100 BTU/ft/sec	Fires can generally be attacked at the head or flanks by fire fighters using hand tools. Handline should hold fire.
4 – 8 feet	100 – 500 BTU/ft/sec	Fires are too intense for direct attack on the head with hand tools. Handline cannot be relied upon to hold the fire. Bulldozers, engines, and retardant drops can be effective.
8 – 11 feet	500 – 1000 BTU/ft/sec	Fires may present serious control problems: torching crowning, and spotting. Control efforts at the head will probably be ineffective.
> 11 feet	> 1000 BTU/ft/sec	Crowning, spotting and major fire runs are probable. Control efforts at the head of the fire are ineffective.

Fires are classified according to the fuels they are burning in; ground fires, surface fires, and crown fires. Each burns with different intensities and spread rates depending on fuel, wind, and topography. The transition from a fire burning in the surface fuels on the forest floor to a fire that burns in the crowns of the trees is determined by the amount of available fuel, the fire intensity or flame length, the presence of ladder fuels to carry the fire into the standing trees, and the wind. A fire may start out torching a single tree or small group of trees. When a fire becomes established in the tree crowns, the wind will usually carry the fire in the crowns creating fire intensities that cannot be dealt with by fire suppression forces.

Crown fires are normally driven by the wind but the dryness of the fuels and tree crowns can cause what is known as a plume dominated crown fire. Crown fires of this type occur because of dry, explosive, and cumulative drought conditions present in the forest. A plume dominated crown fire does not necessarily need wind to keep it sustained. Because of successful fire suppression efforts for the last 100 years, the increased fuel complex in many areas increases the potential for a plume dominated wildland fire.

Spot fires are caused by burning embers carried aloft by the wind and smoke column and dropped ahead of the main fire front. Spot fires need a dry fuel bed to ignite and it is not uncommon for these fires to start ¼ to ¾ of a mile ahead of the main fire front. These spot fires create serious problems for fire suppression



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forces trying to protect lives and property well ahead of an advancing fire front. As spot fires start and gain intensity, they can become as active as the main fire front. This was experienced during the Blaine County Fire in 1991. Some fires travel so quickly through a combination of crowning and spotting that there is absolutely no way for fire suppression forces to gain control.

Some of the timber stands in the Highwood's and on the Rocky Boy Indian Reservation would support a crown fire because of the presence of ladder fuels and heavy, down woody debris on the forest floor of the timber stands. This type of stand replacement fire behavior would need to be associated with an extended drought and an ignition moved by extremely high winds.

### **5.8 FIRE BEHAVIOR MODELING**

Three locations were selected for fire behavior modeling. One is located in the eastern side of the county within a portion of CRP (Conservation Reserve Program), the second in the northern portion of the county in the area near the border of the Rocky Boy Indian Reservation and the Bears Paw Mountains and the third involving the Highwood Mountains.

Fires were simulated using the topography on site, typical fuel models present, and the most probable weather under these severe burning conditions. Slopes immediately downwind range from 0% to 30%. The values predicted are only approximations, but never the less provide a valuable estimate of fire behavior under comparable conditions. The calculated fire size at 1 hour assumes a continuous fuel bed with constant conditions.

Chouteau County has three distinct fire behavior models (a grass model, a brush model and a timber model, each of which can burn at different time of any calendar year. The factors that are similar between the three is a potential to threaten structures and jeopardize the lives of the resident of the county.

#### **CRP Fire**

The first fire behavior run is modeled after the grasses that are grown within the conservation reserve program (CRP) enrolled lands. This fire behavior run will display a fire that is initiated within the agricultural base of the county. Although the fire can occur over a large portion of the county, for this exercise, the fire is located west of Fort Benton near the western boundary of the county.

A fire starting on a parcel of CRP ground can potentially burn from the time that the grasses cure and dry until they move out of dormancy in the spring. The main source of fuel for the fire will be those grasses on the CRP parcel. The prevalent winds are southwest. Winds speeds of 20-40 mph are not unusual and can continue for long period of time. Chouteau County can be very dry, so even with fairly low temperatures the relative humidity remains very low. In the grass model this is the second critical factor.

With high winds and low relative humidities the CRP fire will quickly move from the southwest to the northeast. Long and short distance spotting will make this fire extremely difficult to control and potentially lethal to those things that lie in its path.

Although the elliptical shape of this fire shown on the map seems quite uniform, this fire will be an irregular pattern due to the available fuels (CRP) and scattered parcels of agricultural lands that are being tilled.

The fire that will be described in this fuel model will not be the worst case weather scenario, but one that could easily happen during periods of less critical fire weather, but one that will still have significant potential.

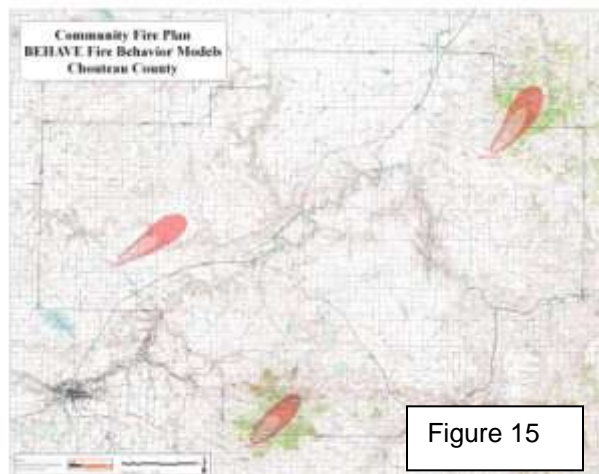


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Assuming a fire starts on a late fall day at approximately 1400 with southwest winds of 30 mph and a using the critical fuel moistures from page 44. A six hour burning period will be used for the fire behavior projection and final fire size. A six hour window is used, since the fire behavior will be slowed once the area loses its energy provided by the sun. In most cases, but not all, once the relative humidity rises above 40%, the ability to use direct fire suppression tactics may be employed.

Using a 30 mph wind with the critical fuel moistures, this fire potentially could move at a rate of over 200 chains per hour (13,200 feet per hour) and reach a size of 3,506 acres at the end of two hours, 14,033 acres at four hours and 31,576 acres at the end of six hours. These rates of spread typical, but in real life, the broken topography, the scattered parcels of till agricultural lands and potential long distance spotting will have significant affect on the total size of this fire. For these exercise, the elliptical shape of the fire is based on the rates of spread described (See Figure 15 and Behave Fire Modeling Map in Section 10.5).

Those structures in front of this fire would certainly be in jeopardy without an adequate asset protection zone (defensible space) and most likely could not be protected due to the size and scope of this event. An evacuation would be started by the Chouteau County Sheriff's Department.



### Highwood Fire

The Highwood Mountain Range is located in the southeastern side of the county. This mountain range juts up from the prairie surrounding it and is predominantly Douglas fir and lodgepole pine habitat types.

In the late 19<sup>th</sup> century this mountain range burned completely and regenerated to the mixed conifer stands that exist today. The natural fuel loading within the range is quite slight except where some limited burning has been completed by the Forest Service. The prescribed fires conducted by the Forest Service killed a variety of age class and size class trees. Some and eventually all of these trees will come down and contribute to the natural fuel loading within these project areas. Since these prescribed burn projects areas do not encompass large tracts of ground, their influence on sustained fire behavior will be limited. From forest health perspective, the timber stands are in good shape and these stands will remain healthy until they reach an older age class.

The fire that will be modeled will be one that will burn only during periods of sustained drought. This will limit the longer burning window that was described in the CRP Fire example.

During period of sustained drought, a fire beginning along the southwestern side of the Highwood Mountains at a lower elevation and pushed by winds of 30 to 40 mph can move a fire off the ground and into a crown fire.

The conditions that need to exist that can cause a fire of this nature are:

- Long term drought that will reduce live fuel moisture to the extent that was displayed during the 1988, 2000 and 2003 fire season.
- High sustained winds speeds
- Critical fire weather (single digit relative humidity's and high temperatures)
- An ignition located downwind and on a steep slope.



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- A day of very high probability of ignitions
- Very low humidity recovery

A fire starting under these conditions would easily transition from a ground fire to a crown fire. A crown fire initiating along the southwestern side of the Highwood's would move upslope to the northeast. Long distance spotting would cause the fire to move across the entire mountain range. If the critical fire weather continued for a number of days and free burning condition exist, the entire range could be threatened. This could be very similar to the fire that burned most of the range in the late 19<sup>th</sup> century. If this occurred, this fire would transition from a wind dominated fire to a plume dominated fire that could burn until those conditions cease to exist or the fire runs out of available fuel.

Using a 30 mph wind, the rate of spread will be 29 chains/hour (1,914 feet/hour), at 40 mph wind the rate of spread will be 46 chains/hour (3,036 feet/hour), and at 50 mph the rate of spread will be 67 chains/hour (4,422 feet/hour). A fire, starting under critical fuel moisture condition and driven by a 30-50 miles per hour wind, could move across the Highwood Mountains and onto the prairie. A fire burning under these conditions potentially can reach a size of 11,856 acres in a six hour burning window, with sustained winds.

This will not be an easy fire to suppress and one that potentially will threaten lives and structures within its path. The Highwood Mountains do have some natural fuel breaks that will modify this fire's spread, but as occurred in the late 19<sup>th</sup> century, they were of little value. The opportunity for fuel and climatic conditions to exist that have the potential for this type of event, are limited, but have occurred three times in the past fifteen years. As time passes and the stands age and reach maturity, the risk of this fire event occurring is greater.

### **Rocky Boy Fire**

In the east and northeastern corner of Chouteau County is a substantial portion of mixed conifer and sage intermixed with a variety of grasses. The topography in this area of the county is broken terrain with mountainous features. The grass and sage are generally located on the southern high energy exposures. The timber component is scattered along the southern exposures, but dominant on the northern exposures. Grazing has modified the fuel bed and resulting fire behavior. The climatic conditions of the area are similar to those in the other parts of the county, but the area does include a wind anomaly that can affect night time burning conditions.

This fire will begin along the bottom third of a southern exposure and will move to the northeast driven by both the wind and topographical features. The wind will be the primary driver moving the fire into a wind dominant plume. Long distance spotting can be expected into all aspects of the topography. Once the wind subsides, high day time temperatures and low relative humidities may cause those heavy stands of conifers located along the northern aspects to become involved in a stand replacement fire.

The Rocky Boy Fire was modeled using fire model 6, since fuel model 4 tends to over predict in this area. Using a 30 mph wind, the rate of spread will be 248 chains/hour (16,368 feet/hour). A fire burning under these conditions can reach a size of 29,509 acres in a six hour burning window, with sustained winds.

### **Summary**

The fire events described above are not atypical and should be expected and should be used for planning purposes.



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The overall complexity of any ignition that escapes initial attack or a set of weather and fuel conditions, which indicate the potential for large fire growth, could adversely affect public health and safety, property and resources values requires a coordinated public safety effort in Chouteau County.

Chouteau County has the potential to experience and has experienced large wildland-urban fires similar to that as illustrated by the BEHAVE run. As a result, the County needs to ensure that a coordinated planning, warning, communication and evacuation system is in place. In addition, the Chouteau County Fire Department staff needs the knowledge, skill and ability to manage a large and complex wildland fire management workload.

### 5.9. Fire Effects Assessment

Wildland fires generally have three possible outcomes on forested areas. They can be lethal, non-lethal or mixed. These outcomes are alluded to in 5.1 Fire Regime Condition Class. A broad definition of each follows:

- Lethal – Fire is of high enough intensity and long enough duration to cause mortality in all or most of the trees and shrubs in the burned area. This result is likely in a hardwood ecosystem but the exception in a healthy ponderosa pine ecosystem. It can result, however, from severe burning conditions and/or unnaturally high fuel accumulations in the forest. When a lethal fire occurs it will be evident for decades that the area has been burned.
- Non-lethal – Fire is not of high enough intensity or long enough duration to kill the trees in the burned area. This is a more normal result in a healthy ponderosa pine ecosystem since the trees have adapted to fire by producing a thick bark. This bark protects the tree's cambium from heat. Within two years of a non-lethal burn almost all evidence of the fire has disappeared.
- Mixed – Fire will create significant areas of both lethal and non-lethal effects within the burned area.

Unless a lethal or mixed fire is experienced, any wildland fire burning in Chouteau County has a much higher probability of negatively impacting human improvements, livestock and forage than it does creating any long term damage to natural resources. While a wind driven, high intensity fire can certainly occur in the county, most fires are expected to be non-lethal or mixed. They may kill pockets of trees in places like draws and steep slopes but many trees will survive. A ponderosa pine can have over 60% of its crown scorched and it can still produce new needles the following year. The most significant natural resource loss from a non-lethal fire may be the short-term loss of forage for livestock.

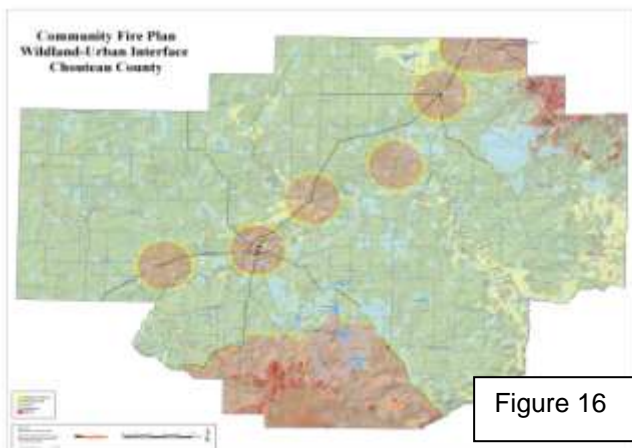


Figure 16

Landowners can reduce the exposure of their buildings, structures and themselves to a spreading fire. Asset protection and fuel modification zones, which may include grazed areas, should be in place around sites needing protection (See Figure 16 and the Wildland-Urban Interface Areas Map in Section 10.5). This is particularly effective on the south and west sides or down slope from such areas since most fires will progress to the north and east or upslope. Exceptions to this general rule can occur when a thunderstorm is in the vicinity of the fire and downdrafts from it cause the fire to spread erratically.



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It is imperative that any new start be controlled as soon as possible. If a fire goes unattended it will continue to spread making eventual control more labor intensive and probably more difficult as it gets into new fuel sources. It also increases the chances of the fire being exposed to some type of severe weather event that can create a dangerous situation for life and property including those of the fire fighters.

### **5.10. County Fire Complexities**

Chouteau County has several distinct issues that not only make the wildland fire program complex, but requires very highly skilled fire managers to provide fire leadership and maintain success.

The fire issues revolve around the semi arid landscape and poor moisture regime that due to the lack of moisture during any of the four seasons can place the county into a fire season throughout a large share of the year. Many counties in Montana go through periods of long term drought, but few have the extremely arid landscape that even on a good year goes for long period without significant precipitation.

The second issue is the significance of wind that is generated from the Rocky Mountain Front Range, which is a part of living in the county, but one that can turn an ignition into a large wildland fire in a very short period of time.

The third issue is the size and scale of the county and the scattered numbers of outlying fire stations. Tied with this issue is the significant reduction in number in the population of this rural county and age class of available fire fighting personnel.

The fourth issue is the fuel complex that includes fire behavior grass models, brush models, and timber models. The grass and brush models cover the largest part of Chouteau County and are the fuel types that result in the highest number of ignitions. In the grass models, the most challenging fire problem results from the Conservation Reserve Program. This program is an excellent wildlife and soil conservation program, but provides for challenging wildland fire suppression efforts if lands that are enrolled in the CRP program are ignited. These parcels of CRP land are scattered around the county, easily ignited, and could result in extreme fire behavior, especially under windy conditions.



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## 6. Risk Assessment

A fundamental part of any fire plan is identifying what you might lose in a wildland fire, known as assets or values at risk.

### 6.1. Values at Risk

The primary intent of fire protection is to protect the values at risk and maintain healthy forest and grassland ecosystems. The purpose of a successful fire management program is to reduce the risks associated with values that are important to the county, its citizens, and natural resources. Values at risk will be used to assist fire protection agencies in prioritizing mitigation projects.

Some of the values at risk in Chouteau County are:

- Health & Safety – Public & Fire fighters
- Property, Improvements & Facilities – Private & Public
- Recreation/Community Impacts – Economic & Social
- Forest/Ecosystem Health
- Timber, Grazing, Hay and Grain Crops
- Cultural and Historic Resources
- Aesthetics/Scenery

#### 6.1.2. Health and Safety

**Fire fighter safety should never be compromised.**

Chouteau County needs to maintain the safety of their fire fighters. Thorough situational awareness on the part of the firefighter and strong incident management by the fire department leadership is critical to the safety of personnel. Wildland fires are capable of moving over significant distances in a short period of time. It is possible that firefighting resources could become trapped during one of these events if they do not maintain a constant situational awareness.

Chouteau County has the potential to have a series of multiple wildland fire situations during any fire season. A fire season of this nature could conceivably last for several months. The county fire agencies should work toward expanding their leadership capability so they can deal with simultaneous complex ignitions.

In 1997, the “TriData Study: Wildland Firefighter Safety Awareness Study” was commissioned to find ways to improve firefighter safety. Of the 114 recommendations, the #1 recommendation was to “Implement a large-scale, long-range fuel management program.” Fire protection agencies, county officials, and the public must insist on hazardous fuel reduction efforts on a landscape-basis if they are truly serious about improving safety of not only fire fighters but the public in general.

#### 6.1.3. Property, Improvements & Facilities

Few wildland fires burn where there is not some threat to homes, ranch out buildings or other structures, fences, power lines, communication sites, or some other type of infrastructure. Since 1990 the National Association of Home Builders estimates that 60% of the new homes built were located in the wildland urban interface.<sup>18</sup> Fuel treatments (asset protection zones) in the immediate area around structures, designed to reduce wildland fire intensity, can dramatically improve their probability of survival. However,

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<sup>18</sup> Dan Bailey, ICC, personal conversation



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restricting treatments to these areas does little to protect other values-at-risk, some of which may be equally or more important from a neighborhood and/or a community standpoint.

One of the largest problems facing wildland protection agencies in Chouteau County is the unwillingness of residents to realistically look at the fire environment in which they live and their failure to correct hazardous fuel situations around their homes and other structures. In lieu of county residents undertaking any kind of hazard abatement actions that would mitigate fire behavior potential, the protection organizations have no choice but to take only such actions that will facilitate orderly evacuation of occupants and will insure the safety of their fire fighters. This will mean writing off some structures where the Incident Commander cannot reasonably expect the apparatus or the fire fighters to safely withstand an oncoming fire front.

## 6.1.4. Recreation

Opportunities to enjoy outdoor recreation activities can also be severely hampered by wildland fire and fires can have an adverse effect on the economy of Chouteau County. Areas can be closed to the public for extended periods of time during high fire danger. Often these closures and restrictions occur in early fall during upland bird and big game hunting seasons when many non-county residents have plans to travel to the area.



Figure 17

Recreational activities contribute significantly to the economy of the county, but at the same time unattended campfires in the campgrounds cause impacts to the fire protection system (See Figure 17).

## 6.1.5. Forest/Ecosystem Health

See Section 5.4 Local Fire Ecology.

## 6.1.6. Timber, Grazing Hay and Grain Crops

Agriculture and grazing are two of the primary uses on the private lands in Chouteau County. Haying and hay storage, grain fields and croplands are at risk during large wildland fire. During the Blaine County Fire, ranchers affected by the fire were more concerned about the losses to their grazing and hay storage than they were about their homes and improvements on their ranches.

The Bureau of Land Management, Fish and Wildlife Service and State of Montana has scattered land holdings within the county and are tasked with providing rangeland and recreation use on those lands.

There is some limited potential for timber harvest within the county with some harvests occurring on private ranches.

## 6.1.7. Cultural and Historic Resources

There are cultural and historic resource sites located throughout Chouteau County that need to be protected during fire suppression and fuel reduction activities.

## 6.1.8. Aesthetics/Scenery

Picturesque long-distance vistas especially in the Missouri and Marias River Corridors are a very important



Figure 18





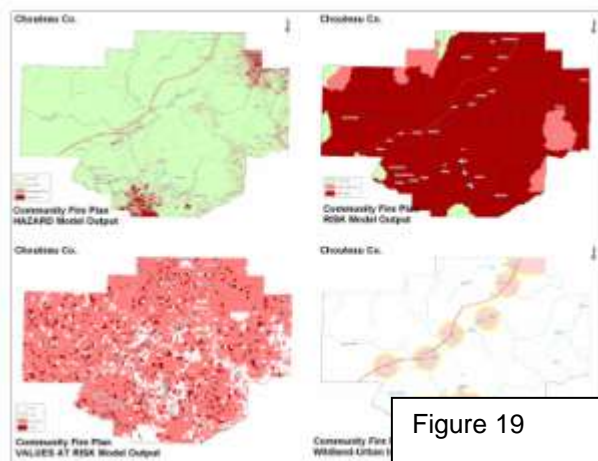
# Community Wildfire Protection Plan Chouteau County, Montana

component of the landscape. Wildfires impact the aesthetics of an area, which can further impact the economy of the county by impacting tourism (See Figure 18).

## 6.2. Risk Estimation

As with the federal agencies, the county's first priority is protection of human life and secondly, personal property.

In order to identify the problem areas in Chouteau County a process was developed by Fire Logistics to



look at hazard, risk and values in a collective manner (See Figure 19 and Fuel Hazard Model, Risk Model, Values at Risk and Fire Hazard Assessment Model Maps in Map Section 10.5).

Fire hazard is the interaction of fuels (vegetation, buildings, and other flammables), topography (fires will burn more intensely on south and west slopes, up slopes, in narrow draws, and on upper slopes), and weather (temperature, wind speed and direction, and humidity). The interaction of these factors affects the rate of spread and the intensity of a wildland fire.

Fire risk is the chance that a fire will start in a particular area. Although lightning is an important and leading cause of wildland fires, person caused wildland fire starts are a common source of ignition. The greatest number of human activities with fire starting potential is found close to a home. Common causes of wildland fires include children experimenting with fire, chain saws, grass mowers, debris burning, improper disposal of barbecue coals and ashes, and smoking. Structure fires have the potential to spread into the wildlands. Power lines, agriculture activities, hiking trails, campgrounds, recreational activities and harvesting are other activities or uses that are of high fire risk.

Values at risk include life (fire fighters and the public), communities, property, infrastructure, industrial facilities, timber, grazing and natural resources.

The first step was to develop a vegetative layer that placed the prevalent cover types into a high, moderate, low or inflammable category. This was overlain with a map of the historical fire occurrence for the county for the past 11 years. This created a good representation of where fires traditionally occur and what their potential for growth would be. The third factor incorporated was the location of structures by parcel. This helped identify where the priorities, in terms of life and property, for protection existed. This composite map gave Fire Logistics a basis for their recommendations to Chouteau County for focusing prevention, protection and fuels modification efforts in the areas where they would be of most benefit.

### 6.2.1. Discussion of Risk

Most working ranches have adequate clearing around them to hypothetically protect them from crown fire or a running surface fire. A problem can occur if there is too much clutter or untended vegetation around their structures however, that would allow for a simple surface fire to ignite those structures.

Subdivision structures are inherently more vulnerable. People who own them often fail to recognize the relationship between the amount of vegetation around their structures and the threat to that structure from a wildfire. Some are even obstinate about that point and they refuse to remove any vegetation even though its continued presence reduces the probability that their home will survive a wildfire to almost



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zero. Fire fighters must be very careful to look out for their own welfare first when asked to protect a structure where the owner has refused to do any work to enhance that structure's probability of surviving a wildland fire (See Figure 20).

The following list represents current priorities for fire protection within Chouteau County.

Ranches, out buildings and town sites threatened from a fast moving CRP fire

The Highwood Mountains and associated areas

Geraldine  
Square Butte  
Duck Creek Drainage  
Boxelder Creek  
Bears Paw



Figure 20

In looking at the GIS layered map of Chouteau County and the modeled fires, it is apparent why these priorities have been established. These areas are particularly challenging from a protection standpoint because of the lack of some basic amenities such as access, telephone service and a water supply. The response times are also lengthy for wildland fire fighters because of the remoteness of these areas.

History has proven the possibility for large wildland fires in this part of the state when enough continuous fuels are available and when certain weather conditions are present. During one of these events, the actions that have been taken beforehand will generally prove to be much more effective than any actions taken during the event. When conditions of extreme fire behavior exist little can be accomplished aside from evacuating people from harms way and keeping fire fighters in safe positions. Any fuel modification efforts that have been completed prior to the event will greatly enhance the firefighter's efforts to protect property during the event.



# Community Wildfire Protection Plan

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## 7. Mitigation Strategy -- The Action Plan

This Chapter provides the steps that are being taken or should be taken in Chouteau County to reduce the wildland and structure fire threats to public, fire fighters and other values at risk.

### 7.1. Mitigation Goals

***An overarching principle of this Community Wildfire Protection Plan is that fire fighter and public safety is the highest priority!***

The mitigation goals of this Community Wildland Protection Plan are to:

- Identify, designate and map areas of wildland-urban interface in the county.
- Evaluate, upgrade and/or maintain community wildland and structural fire preparation and response facilities, water supplies, and equipment to suppress and mitigate wildland fire risks with financial assistance through competitive grant program administered by the MT DNRC.
- Prevent threats to and destruction of property from wildland fire by adopting subdivision regulations, which include access, water supply, asset protection zones, and fire stations.
- Develop and maintain regulations to ensure asset protection zones are created and maintained around structures and improvements in the county.
- Educate community members to prepare for and respond to wildland fire and to mitigate wildland fire damage.
- Improve training and qualifications of fire personnel to more efficiently manage incidents and to effectively interface with incoming Incident Management Teams deployed in the county.
- Work as a partner to identify, coordinate and implement fuels reduction projects between private landowners, the Lewistown Field Office of the Bureau of Land Management, the Lewis & Clark NF, the Bureau of Indian Affairs, and the Rocky Boy Indian Reservation.
- Position fire protection agencies, county leaders, rural communities, residents, and forest owners and managers to be better prepared to protect the County's residents and its natural resources from the potentially devastating impacts of wildland and wildland-urban interface fires.
- To identify economic development opportunities for fuel reduction enterprises.
- Decrease the chances of a wildland fire spreading from federal lands onto private lands while, correspondingly, decreasing the risk of a wildland fire spreading from private lands onto federal lands within the county.
- Reduce wildland fuel loads in and around our neighborhoods and communities, create fuel breaks in appropriate locations in Conservation Reserve Program lands and promote healthy forest and rangeland ecosystems by reduction of hazardous fuels.
- Implement the Chouteau County CWPP with ongoing monitoring and evaluation

Planning priorities of the CWPP in order of importance are:

- Protect human health and life



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- Protect critical community infrastructure
- Protect private property
- Protect natural resources

## 7.2. Existing Mitigation Efforts

The following sections describe the existing mitigation measures that are being utilized in Chouteau County to decrease the risks from wildland or wildland-urban interface fires. Chouteau County and Chouteau County fire agencies should ensure that these efforts are supported and continued.

### 7.2.1. Fire Protection Response

Long travel distances for fire suppression resources are the norm in Chouteau County. The Chouteau County Fire Departments have located the engines and water tenders as strategically as they can throughout the county within the opportunities that exist. Each engine must be hosted, maintained and operated by a willing volunteer, i.e., a rancher. When a fire is reported the Chouteau County fire personnel are notified and they respond on a closest forces concept. They also respond to new ignitions reported on BLM and USFS administered lands.

The federal agencies have developed strict requirements for wildland fire fighters including an annual physical fitness-testing requirement. These are the result of a myriad of reviews and investigations of serious incidents that have occurred in wildland firefighting over the years. All Chouteau County FD personnel who are dispatched out of their jurisdiction must meet the same standards as their federal counterparts.

## 7.3. Coordinated Prevention, Protection Projects, and Response Plan

Future efforts in planning and implementation of prevention, mitigation and response projects should be closely coordinated between Chouteau County and their cooperating partners, i.e., BLM, USFS, and the State of Montana. It is likely that some projects would be more effective if implemented on the lands of two or more jurisdictions rather than by a single entity. Cooperation and coordination will also result in avoiding duplicating efforts or overlooking opportunities to protect values at risk.

In an effort to reduce new fire starts during periods of very high or extreme fire danger, there is a statewide process for instituting fire restrictions and closures by zone in the Northern Rockies Geographic area (See Figure 21). Chouteau County and its cooperators are coordinated in this process through the Great Falls Division – Central Montana Zone, to ensure close communications and common actions occur during critical periods of fire danger.

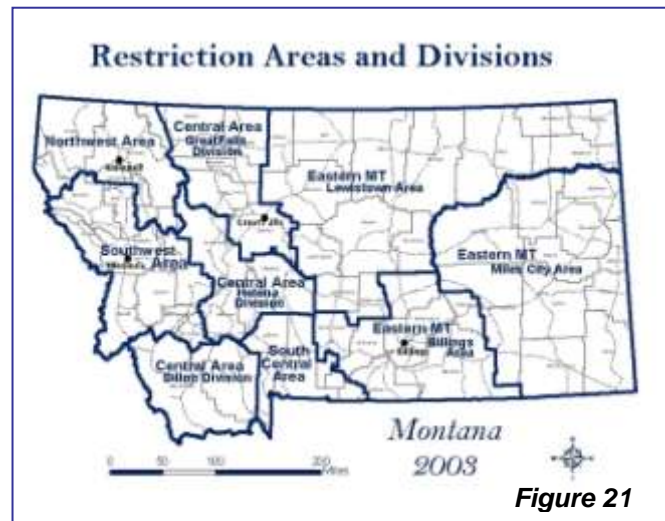


Figure 21

## 7.4. Prioritization Process

Recommended projects have been prioritized based on the risk estimation in Section 6.2. See 7.6 Prioritized Actions.



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## **7.5. Recommended Projects and Programs**

This area describes recommended projects and actions that address the mitigation goals of the Chouteau County CWPP. The funding mechanism for both the State of Montana and BLM is directed toward projects that show collaboration between private, counties, tribes, state and federal partners.

### **7.5.1 Wildland-Urban Interface Areas**

Recommended Project 7.5.1.1 – The Chouteau County Board of County Commissioners should designate the following as wildland-urban interface areas in Chouteau County:

- Town sites of Big Sandy, Loma, Virgelle, Fort Benton, Carter
- Highwood, and the Highwood Mountains and associated areas
- Geraldine
- Square Butte
- Duck Creek Drainage
- Boxelder Creek

Project Coordinator – Chouteau County DES Coordinator

### **7.5.2. Fuel Modification Projects**

This section addresses specific actions to reduce fuel loads, whether in forests, brush, or grasslands.

Recommended Project 7.5.2.1 – Form a collaborative planning group (Fire Safe Council) with the BLM, ranchers, Chouteau County fire agencies, Chouteau County Disaster & Emergency Services, Board of County Commissioners, power companies, BNSF and other cooperators to plan fuel reduction projects on a landscape basis.

Project Coordinator – Chouteau County Fire Warden

#### **7.5.2.1. Vegetation Management**

Silvicultural treatment of fuels is a technique used to eliminate a portion of the fuels in forested areas. Some of the smaller trees are cut and removed to create more growing space between the larger trees. This basic forestry practice of thinning will usually increase timber values for the landowner by concentrating annual growth in a few larger trees rather than many small trees.

Limbing is another technique accomplished by removing the lower branches of trees and like thinning it reduces the ladder fuels that allow a fire to climb from the ground up into the forest canopy. General litter cleanup is the removal of dead and downed woody debris on the forest floor that can contribute significantly to fire behavior, as these fuels tend to be very dry and readily combustible.

Recommended Project 7.5.2.1.1 – Reduce the vegetation in those areas within the Highwood Interface Area where the continued presence of the fuels represents a clear potential to generate high fire intensities. Wildland fires burning under high intensities will pose the greatest threat to structures, their inhabitants or fire fighters. The county could start in those areas where fuel modification projects would have the most potential to positively impact the greatest number of people or structures (Farmers Union Camp and adjacent owners). Changing crown density and interrupting the ladder fuel continuity should be highest priority. Fuel modification areas need to be a minimum of 50 feet wide and closer to 100 feet whenever possible. Look for areas of active tree or shrub encroachment where the absence of periodic natural fires has allowed vegetation, like juniper or heavy ponderosa pine regeneration, to survive.



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Eliminating these plants while they are young is relatively inexpensive and over time it will significantly reduce the resistance to control factor for fire fighters when fighting a fire in that area.

Project Coordinator – Chouteau County Fire Warden, USFS and BLM

Recommended Project 7.5.2.1.2 – Once the fuels in an area have been reduced to an acceptable level it is critical that they not be allowed to return to the condition they were in prior to treatment. Treated areas should be inspected at 5-10 year intervals to determine if they would still be effective during a wildland fire. Most likely they will need some type of follow up maintenance, at that point in time, but this work should require less effort and at a reduced cost from the original treatment. If it is not accomplished periodically the full treatment costs will be required again in 20-30 years.

Project Coordinator – Chouteau County Fire Warden, USFS and BLM

Recommended Project 7.5.2.1.3 – Develop additional fuel reduction projects around the Highwood Mountains and Square Butte.

Project Coordinator – Chouteau County Fire Warden, USFS, BLM, the Rocky Mountain Elk Foundation

Recommended Project 7.5.2.1.4 – Develop a fuels reduction program jointly with the Rocky Boy Indian Reservation to construct fuel breaks and asset protection zone (defensible space) around improvements on the Indian Reservation.

Project Coordinator – Chouteau County Fire Warden, Rocky Boy, and BIA

Recommended Project 7.5.2.1.5 – Develop a fuel reduction plan for Round Butte area.

Project Coordinator – Chouteau County Fire Warden, USFS, BLM and Rocky Mountain Elk Foundation

Recommended Project 7.5.2.1.6 – Identify strategic fuel break locations, throughout the county, along county roads that are either mail routes or school bus routes to break up the continuity of the CRP. The fuel breaks should be constructed as wide as possible along both sides of the county road to provide an opportunity to anchor or suppress a fire in the CRP.

Project Coordinator – Chouteau County Fire Council and Chouteau County Fire Warden

Recommended Project 7.5.2.1.7 – Develop an educational program to present to the residents of Big Sandy, Loma, Virgelle, Fort Benton, Carter, Highwood, Geraldine and Square Butte to inform them of the risks from a CRP fire and the need to construct asset protection zones (defensible space) around their communities.

Project Coordinator – Chouteau County DES Coordinator

Recommended Project – 7.5.2.1.8 – Involve the Rocky Mountain Elk Foundation and other interested conservation groups with the IX Ranch and other interested ranchers to implement stewardship fuels projects on their ranch lands.

Project Coordinator – Chouteau County Fuels Coordinator

Recommended Project – 7.5.2.1.9 – Work with owners of cottonwood river bottoms where an early spring or late fall fire in the river bottoms will threaten Loma or other communities to implement a fuel management prescription that would divide the cottonwood stands into 40 acres blocks separated by plowed lines that are at least 15 feet wide.



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Project Coordinator – Chouteau County Fuels Coordinator

### **7.5.2.2. Prescribed Burning**

Prescribed burning—or controlled burning—is a relatively quick and inexpensive way to reduce fuel loads. However, in many situations, especially where there are structures nearby, preparatory work needs to be done to reduce the overall flammability of the site.

The county may wish to explore the opportunities for using prescribed fire on private lands especially on the CRP lands within the county. There are some tangible benefits to local ranchers and when they use low to moderate intensity prescribed fire to increase the quantity and palatability of grass on pastures and CRP. It will also set back the encroachment of ponderosa pine unto grasslands where this is a problem. Forage levels have been increased two to four times the pre-burn levels on many sites in Montana and sage has been reduced to about 10 percent of pre-burn levels. One drawback to prescribed fire is that the area to be burned should not be grazed for one season prior to burning and one season after burning. The reasons are to insure enough fine fuels are present on the site to adequately carry the fire during burning and to allow the new and/or rejuvenated grass plants adequate time to develop healthy root systems the following growing season. Several research publications completed by the Intermountain Research Station discuss the types of results that can be expected.

One of the greatest benefits to prescribed burning is the training opportunity it provides for the fire fighters. On a wildfire they are often forced to be reactive rather than to plan and execute actions in a more orderly fashion. When conducting a prescribed burn they will be able to observe fire behavior in a non-emergency setting. They will also learn how to effectively ignite the area to be burned and how to deploy the holding forces to make the best use of available skills and equipment. All of this can be accomplished while functioning in the serious but more controlled environment of a prescribed fire.

Recommended Project 7.5.2.2.1 – Opportunities may arise from planning efforts to jointly conduct prescribed fire projects. Chouteau County fire agencies should participate in these burns when practical to improve their training, qualifications and experience in wildland fire management. Efforts such as these promote better interagency cooperation and working relationships.

Project Coordinator – Chouteau County Fire Warden, USFS and BLM

Recommended Project 7.5.2.2.2 – Work with the Chouteau County Weed Department to establish a wash requirement for contractors, local and government apparatus that conduct prescribed burns within the county.

Project Coordinator – Chouteau County Weed Department

Recommended Project 7.5.2.2.3 – Chouteau County fire agencies and Chouteau County Conservation District conduct a prescribed burning workshop for farmers and ranchers.

Project Coordinator – Chouteau County DES & Chouteau County Conservation District

### **7.5.2.3. Grazing**

Chouteau County can expect the continued encroachment of fires off of timbered grounds, such as BLM and USFS lands, onto private ownership.

Recommended Project 7.5.2.3.1 - Landowners should be encouraged to sustain grass ecosystems through grazing and to control tree encroachment in those areas, particularly where they are adjacent to



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heavily timbered federal lands.

Project Coordinator – Chouteau County Conservation District and Chouteau County Fire Warden

## 7.5.3. Industrial Resource Management

Recommended Project 7.5.3.1 – Work with the gas and oil development companies to develop fuel reduction and fire protection measure to ensure that wildland fires do not impact the oil and gas facilities.

Project Coordinator – Chouteau County DES Coordinator

Recommended Project 7.5.3.2 – Ensure that railroads within the county control the fire hazard along their right-of-way according to Section 69-14-721 MCA. If a fire occurs as a result of an ignition along the railroad right-of-way, the Chouteau County Fire Departments should ensure that a fire investigation occurs to document that the cause and origin of the fire was the railroad and then bill the railroad for suppression costs for all railroad fires.

Project Coordinator – Chouteau County Fire Warden

## 7.5.4. Biomass Utilization

Recommended Project 7.5.4.1 – Explore any opportunities to dispose of biomass material on either a profit or break even basis. If there is no market for chips or hog fuel in the area and no possibility of utilization for posts or poles, look at designating a site or sites where material can be safely piled and burned during low fire danger periods.

Project Coordinator – Chouteau County DES Coordinator

Recommended Project 7.5.4.2 – Explore involving the local RC&D or other economic development agencies within north central Montana to develop companies which might utilize the biomass generated from the fuel reduction projects (See Figure 22).

Project Coordinator – Economic Development Groups in Chouteau County



Figure 22

## 7.5.5. Safety Zones

Location of safety zones within some of the subdivisions is probably the best approach to protecting human life during a fast moving fire, especially when residents are faced with the alternative of trying to navigate narrow roads under smoky conditions. Any required clearance work on these identified areas should be accomplished prior to fire season as labor and equipment become available. One important point is to insure that the development of procedures, such as when to occupy them and what should and should not be taken into them, are clearly understood by anyone who may need to use them.

Recommended Project 7.5.5.1 – Review the Farmers Union Camp protocols or procedures to determine if safety zones may be necessary considering ingress and egress issues as well as the surrounding fuel type.





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Project Coordinator – Chouteau County Fire Warden

### **7.5.6. Infrastructure Improvements**

Improvements to improve local infrastructure are discussed in this section.

#### **7.5.6.1. Water Supply**

Although water supply is not a direct function of the Chouteau County fire agencies, water supply unquestionably impacts the structure fire suppression performance of the department. Water supply, or lack of water supply, indirectly affects the whole community through the insurance rates they pay.

Recommended Project 7.5.6.1.1 – Prepare a strategic water source plan for the county, which shows the most efficient sources of water needed to support wildland firefighting efforts. It may be necessary to develop new sources in some isolated dry locations in order to reduce refill times to an acceptable level. Explore opportunities to use dry hydrants and stored water facilities. GPS the location of water supply points to develop a water supply map for Chouteau County.

Project Coordinator – Chouteau County Fuels Coordinator

Recommended Project 7.5.6.1.2 – Continue to encourage individuals to develop water sources that can be used by fire protection personnel.

Project Coordinator – Chouteau County Fire Warden

Recommended Project 7.5.6.1.3 – Work with the design engineers who are developing the Rocky Boy Water System to ensure that the water mains that are supplying water to towns in Chouteau County are engineered and sized to ensure adequate fire flows for the community over and above peak domestic water demand.

Project Coordinator – Chouteau County DES Coordinator

#### **7.5.6.2. Utilities**

Recommended Project 7.5.6.2.1 – The Chouteau County fire agencies should work with Northwest Energy, Hill County and Sun River Electric Cooperatives to ensure that the required clearances are maintained for all electrical transmission lines in the Chouteau County.

Project Coordinator – Chouteau County Fire Warden

Recommended Project 7.5.6.2.2 – Northwestern Energy and Hill County and Sun River Electric Cooperatives should provide power line safety demonstrations to the Chouteau County fire agencies and subdivision and homeowner associations on a biannual basis.

Project Coordinator – Chouteau County Rural Fire Council and Power Company Managers

#### **7.5.6.3. Emergency Response**

Emergency response to wildland, wildland-urban interface and structure fires includes the placement of stations, apparatus and personnel to meet the needs of the community.

Recommended Project 7.5.6.3.1 – All the fire departments should develop a capital improvement plans to



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up-grade fire apparatus and equipment, within Chouteau County Fire Department.

Project Coordinators – Chouteau County Fire Warden, Fire Chiefs with assistance of the Board of County Commissioners.

Recommended Project 7.5.6.3.2 – The Highwood RFD should immediately de-annex any lands within the rural fire district that are included in the Lewis & Clark NF due to the potential of having a cost-share agreement imposed on the rural fire district from a major wildland fire.

Project Coordinator – Board of Trustees of the Highwood RFD

Recommended Project 7.5.6.3.3 – Work with the county commissioners to add structural fire apparatus at the Elim VFC.

Project Coordinator – Chouteau County Fire Warden, Elim VFC Fire Chief and Chouteau County Commissioners

Recommended Project 7.5.6.3.4 – The Chouteau County fire agencies should continue to maintain and enhance the interagency cooperation between the fire departments and MT Department of Natural Resources and Conservation, Rocky Boy Indian Reservation, United States Forest Service and the Bureau of Land Management.

Project Coordinator – Chouteau County Fire Warden, DNRC Area Manager, L & C NF – Judith Ranger District Fire Management Officer and BLM Fire Management Officer

Recommended Project 7.5.6.3.5 – Purchase satellite phones for the agencies that are responsible for emergency services along the Missouri River corridor to insure affirmative communications with the county dispatch center.

Project Coordinator – Chouteau County DES Coordinator

Recommended Project 7.5.6.3.6 – Develop and provide an educational program that communicates information about the levels of service of the county's fire protection agencies to the public.

Project Coordinator – Chouteau County DES Coordinator

### **7.5.6.3.1. Fire Stations**

Recommended Project 7.5.6.3.1.1 – All fire stations should have a well maintained asset protection zone constructed around the fire stations.

Project Coordinator – Fire Department Fire Chiefs

Recommended Project 7.5.6.3.1.2 -- As subdivisions encroach on the southwest corner of Chouteau County, Highwood RFD is going to have to consider adding an additional fire station to provide adequate fire service to any new developments.

Project Coordinators – Highwood RFD, Chouteau County Planning Board, and Board of County Commissioners

### **7.5.6.3.2. Training, Certification, and Qualification**

Recommended Project 7.5.3.3.2.1 – Develop a training program which encompasses County Fire



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Wardens, County Sheriff's, Disaster and Emergency Service officials, Mayors, City Councils and Fire Chiefs, and other government officials, to maintain currency with their fire program to include their roles and responsibilities as government officials. This training would provide the skill level to determine the appropriate level of Incident Management Team (IMT) and the ability to write a delegation of authority to the IMT, which would include the management objectives of the local government for the emergency incident.

Project Coordinator – Chouteau County Fire Warden in association with MT County Fire Wardens Association

Recommended Project 7.5.3.3.2.2 – Consider adopting the National Wildfire Coordinating Group's 310-1 or National Fire Protection Association Standard 1051 as the minimum training standard for Chouteau County Fire personnel as a tool to mitigate liability issues.

Project Coordinator – Chouteau County Fire Warden and Chouteau County Board of County Commissioners.

### **7.5.6.3.3. Operational Procedures & Programs**

Recommended Project 7.5.6.3.3.1 – GPS the perimeters of all fires that are 100 acres or larger and develop a fire history database and maps for the county utilizing GIS. Upgrade GSP units so that they are capable of tracks allowing Chouteau County Fire personnel to map the perimeter of fires larger than 100 acres so that they interface with the county's GIS program at the Chouteau County Disaster & Emergency Services.

Project Coordinator – Chouteau County Fire Warden

Recommended Project 7.5.6.3.3.2 – Chouteau County Fire Department should order the County Assistance Team (CAT) as early as possible during an emerging incident to avoid experiencing key overhead shortages and overloading Chouteau County personnel.

Project Coordinator – Chouteau County Fire Warden

Recommended Project 7.5.6.3.3.3 – The Chouteau County Weed Plan should be amended to require that fire suppression equipment be washed down prior to fire suppression activities to eliminate weed seeds and other noxious species moving into Chouteau County.

Project Coordinator – Chouteau County Weed Department with support from the Chouteau County Fire Warden

### **7.5.6.3.4. Staffing**

Recommended Project 7.5.6.3.4.1 – Develop a recruiting and retention program for the Chouteau County Fire agencies.

Project Coordinator – Chouteau County Rural Fire Council

Recommended Project 7.5.6.3.4.2 – Hire a part time fuels/mitigation coordinator to manage the implementation of the mitigation and fuels projects recommended in this CWPP.

Project Coordinator – Chouteau County DES Coordinator



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### **7.5.6.4. Access**

Recommended Project 7.5.6.4.1 – As road signs are replaced throughout the county, they should be non-combustible reflective road signs that would withstand a wildland fire.

Project Coordinator – Chouteau County Road Department and Chouteau County Commissioners

Recommended Project 7.5.6.4.2 – Install road name signs that are non-combustible and reflective on all roads that currently do not have signs.

Project Coordinator – Chouteau County Road Department

### **7.5.7. Asset Protection Zone (Defensible Space)**

One of the single most important mitigating factors to increase the chances for the home's survival during a wildland-urban interface fire is the creation and maintenance of an asset protection zone (defensible space). An asset protection zone refers to an area around the home where the native vegetation has been modified to reduce the wildland-urban interface fire threat to the home and provides a safe area for fire fighters to work effectively and safely (See Figure 23).

Slope and fuels affect the size of the asset protection zone. Homes near steep slopes and in heavy fuels will need to clear additional vegetation to mitigate the effects of the radiant and convective heat currents and flame lengths. The slopes should be planted to native vegetation that is fire resistant.

Recommended Project 7.5.7.1 - The National Fire Plan also mandates that local governments develop and adopt local land use plans and ordinances that provide for the maintenance of defensible space and fuel management on municipal and private property.<sup>19</sup> The Chouteau County Commissioners have adopted the Chouteau County Development Regulations, which could be amended to include requirements for asset protection zones (defensible space) and fuel management in designate wildland-urban interface areas (See Asset Protection Zone Guidelines in Resources Section 10.4 of CWPP).



Figure 23

Project Coordinator – Chouteau County Fire Warden

Recommended Project 7.5.7.2 – The cities of Fort Benton, Big Sandy and Geraldine should ensure that residences adjacent to wildland areas in the communities of Fort Benton, Big Sandy, and Geraldine are provided with adequate asset protection zones.

Project Coordinator – Fire Department Fire Chiefs

Recommended Project – 7.5.7.3 – Work with the Chouteau County and Big Sandy Conservation Districts to develop an informational brochure to send to the members of the districts about implementing and maintaining asset protection zones (defensible space) around their homes and improvements.

<sup>19</sup> See [www.westgov.org/wqa/initiatives/fire/implement\\_plan.pdf](http://www.westgov.org/wqa/initiatives/fire/implement_plan.pdf)



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Project Coordinator – Chouteau County Fuels Coordinator

## 7.5.8. Recommended Building Materials/Fire Wise Construction

A home may be vulnerable to a wildland-urban interface fire because of its design, construction and/or location. There are steps a homeowner or developer can take to reduce the chance of home catching fire, or resist further damage if it does catch fire.

Recommended Project 7.5.8.1 – Recommend the use of Firewise Construction, Design and Materials<sup>20</sup> and Firewise Construction Checklist<sup>21</sup> to developers and homebuilders. See Resources Section 10.4 of CWPP.

Project Coordinator – Chouteau County DES Coordinator

## 7.5.9. Fire-Resistant Landscaping

The landscaping plan of the homeowner is an integral component of the defensible space developed by the homeowner. Each lot should be thought of in terms of four zones, with each zone having a different purpose and emphasis in the overall defensible space concept for the property.

**Zone A** consists of the area from immediately next to the home to a distance of approximately five feet. The primary purpose of this zone is to have the least flammable type of landscaping immediately adjacent to the home to prevent ignition from firebrands and direct flame contact.

**Zone B** lies between five feet and at least 30 feet from the home. This zone provides the critical area where fire fighters can defend the home and where the fuels have been substantially reduced in height and volume.

**Zone C** represents the lot from 30 feet to approximately 60 feet from the structure. This area lies outside the formal landscape area and should be modified as described in the asset zone guidelines, which are attached (See Asset Protection Zone Guidelines in Resources Section 10.4 of CWPP).

**Zone D** is the property perimeter buffer which is 60 feet to the property line for lots 2 ½ acres or less or 60 feet to 200 feet around the perimeter of lots larger than 2.5 acres. This serves as a transition zone where you want to reduce the wildfire rate of spread and intensity, begin bringing the fire from a crown fire into a ground fire so that fire department resources can safely respond.

Provisions should be made as each phase is submitted for review to ensure the landscaping plans are reviewed for their appropriateness as a component of the defensible space requirement for the property. Provisions also need to be made by the developer to ensure long-term continuing maintenance for the defensible space surrounding the homes and businesses in the project (See Asset Protection Zone Guidelines in Resources Section 10.4 of the CWPP).

Recommended Project 7.5.9.1 – Utilize the Firewise Landscaping Checklist<sup>22</sup> and Fire and Your Landscape, Fire Scaping Resources for Montana Homeowners<sup>23</sup> (See Resources Section 10.4 of the CWPP).

<sup>20</sup> Firewise Construction, Design and Materials, Stack, Colorado Forest Service

<sup>21</sup> [www.firewise.org](http://www.firewise.org).

<sup>22</sup> [www.firewise.org](http://www.firewise.org)

<sup>23</sup> Montana Nursery & Landscape Assoc. 2003



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Project Coordinator – Chouteau County Fire Warden

### **7.5.10. Evacuation Plan**

Getting people out of harms way in a fire is critical. This section addresses specific projects designed to move people quickly, safely, and effectively.

Recommended Project 7.5.10.1 – Annually update evacuation plans for Highwood Creek area and conduct a tabletop exercise biannually.

Project Coordinator – Chouteau County Sheriff & County Disaster & Emergency Services Coordinator

### **7.5.11. Public Education**

Educating residents about wildland fire issues is one of the most effective ways to reduce fire hazards, whether that be in K-12 schools, or programs designed for adults.

Recommended Project 7.5.11.1 – Sponsor a Firewise Community Program locally within the county for the public and conduct it biannually. Integrate weed and fire management into any public education that is conducted during the Firewise Community Program.

Project Coordinator – Chouteau County DES Coordinator

Recommended Project 7.5.11.2 – Utilize a program such as the “Living with Fire in Montana” developed by Missoula County Fire Protection Association to educate residents, realtors, fire and government officials about living in a wildland fire environment.

Project Coordinator – Chouteau County Fuels Coordinator

### **7.5.12. Legal Requirements**

#### **7.5.12.1. Subdivision Regulations**

Recommended Project 7.5.12.1.1 – Adopt appropriate subdivision regulations which address the wildland-urban interface (See Model Subdivision Regulations in Resources Section 10.4 of CWPP).

Project Coordinator – Chouteau County Board of County Commissioners

Recommended Project 7.5.12.1.2 – The county fire warden and fire chiefs need to ensure that wildland fire concerns are addressed in the subdivision review process for any future planned subdivision. The purpose for this input is to avoid creation or perpetuation of any untenable situations, from a fire protection standpoint. Issues such as road systems, water supply, building materials, asset protection zone and covenants covering vegetation management are all of concern to the fire warden and the fire chiefs and they can directly affect his ability to be effective.

Project Coordinator – Chouteau County Planning Board and Chouteau County Board of County Commissioners

Recommended Project 7.5.12.1.3 – Develop a mechanism to track new development and structures, which are in the wildland-urban interface areas of the county to enable structure fire agencies and



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Chouteau County Fire to pre-plan evacuations and fire attack.

Project Coordinator – Chouteau County Fire Warden and Planning Board

### **7.5.12.2. Agreements, MOU's & Operating Plans**

Recommended Project 7.5.12.2.1 – Review all agreements and memorandums of understanding with cooperators. Follow up on those that have not yet been up-dated and insure annual operating plans are completed when specified.

Project Coordinator – Chouteau County Fire Warden

Recommended Project 7.5.12.2.2 – Develop materials and training programs to ensure that a delegation of authority is properly executed between the appropriate “Authority Having Jurisdiction” and the Type III, II, or I Incident Commanders.

Project Coordinator – Chouteau County Fire Warden

### **7.6. Prioritized Actions, Implementation Timeline**



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Recommended Project	Short Term (< 1 Year)	Medium Term (1-3 Years)	Long Term (3+ Years)
7.5.1.1	X		
7.5.2.	X		
7.5.2.1.1		X	
7.5.2.1.2			X
7.5.2.1.3		X	
7.5.2.1.4		X	
7.5.2.1.5		X	
7.5.2.1.6		X	
7.5.2.1.7		X	
7.5.2.1.8		X	
7.5.2.1.9			X
7.5.2.2.1		X	
7.5.2.2.2	X		
7.5.2.2.3		X	
7.5.2.3.1		X	
7.5.3.1		X	
7.5.3.2		X	
7.5.4.1		X	
7.5.4.2		X	
7.5.5.1	X		
7.5.6.1.1		X	
7.5.6.1.2		X	
7.5.6.1.3	X		
7.5.6.2.1		X	
7.5.6.2.2		X	
7.5.6.3.1		X	
7.5.6.3.2	X		
7.5.6.3.3			X
7.5.6.3.4	X		
7.5.6.3.5		X	





# Community Wildfire Protection Plan Chouteau County, Montana

**Recommended Project Table (continued)**

Recommended Project	Short Term (< 1 Year)	Medium Term (1-3 Years)	Long Term (3+ Years)
7.5.6.3.6		X	
7.5.6.3.1.1	X		
7.5.6.3.1.2			X
7.5.6.3.2.1		X	
7.5.6.3.2.2		X	
7.5.6.3.3.1	X		
7.5.6.3.3.2	X		
7.5.6.3.3.3	X		
7.5.6.3.4.1	X		
7.5.6.3.4.2	X		
7.5.6.4.1	X		
7.5.6.4.2	X		
7.5.7.1		X	
7.5.7.2	X		
7.5.7.3	X		
7.5.8.1	X		
7.5.9.1	X		
7.5.10.1		X	
7.5.11.1		X	
7.5.11.2		X	
7.5.12.1.1		X	
7.5.12.1.2	X		
7.5.12.1.3		X	
7.5.12.2.1		X	
7.5.12.2.2		X	



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## **8. Plan Monitoring and Review: How to Keep this Plan Active and Up-to-Date**

### **8.1. Timeline (5 years)**

DMA 2000 requires that plans be updated every five years. This does not mean you have to rewrite it or redo this entire process. Rather, you are required to review your mitigation plan.

Recommended projects should be updated as the keeper of the plan becomes aware of new projects that might be implemented to mitigate a wildland fire problem. The prioritized project list should be revised every year based on new data and available dollars. The entire plan should be updated or reviewed on the same cycle as the pre-disaster mitigation plan.

### **8.2. Incorporation into Local Jurisdictional Plans**

This plan should be adopted by local Chouteau County and the recommendations be coordinated with planning mechanisms, such as a County Growth Policy and Pre-Disaster Mitigation Plan.



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### **9. Summary and Conclusions**

#### **9.1. Analysis and Findings**

The complexity of the wildland fire program has significantly changed in Chouteau County over the last 15 years, due to the development of wildland-urban interface, long term drought, and changes in the wildland ecosystems. The leadership and the level of fire preparedness within Chouteau County have been able to keep pace with this changing environment through the efforts of the County Fire Warden. The Chouteau County Board of Commissioners need to recognize this effort and also need to be supportive of future needs of the County's fire forces to further respond to a changing fire environment and the associated public safety risks.

In the recommended projects and programs section of this report, Section 7.5, significant changes are recommended. Funding for many of these suggested projects and programs can be obtained through the National Fire Plan and FEMA grant programs. The Chouteau County Board of Commissioners is strongly encouraged to utilize a grant writer to increase the wildland fire suppression, public education, training and qualifications capability of the Chouteau County and Chouteau County Fire Departments.