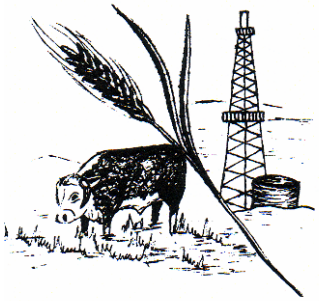
Pondera County, Montana,

Community Wildfire Protection Plan

May 14th, 2007

Vision: *Institutionalize and promote a countywide hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Pondera County.*



This plan was developed by the Pondera County Community Wildfire Protection Plan Committee in cooperation with Northwest Management, Inc., P.O. Box 565, Helena, MT 59624, Phone: (406) 442-7555, Fax: (406) 495-9605, www.Consulting-Foresters.com

Acknowledgments

This Community Wildfire Protection Plan represents the efforts and cooperation of a number of organizations and agencies; through the commitment of people working together to improve the preparedness for wildfire events while reducing factors of risk.

Pondera County Commissioners
and the employees of Pondera County

State of
Montana

USDI Bureau of Land Management

North Central Montana RC&D

Federal Emergency Management Agency

USDA Forest Service

Blackfeet Tribe

USDI Bureau of Indian Affairs

Montana Disaster and Emergency
Services

Montana Department of
Natural Resources and
Conservation

USDI Bureau of Reclamation

City of Conrad
Town of Valier
Community of Brady
Community of Dupuyer
Community of Heart Butte &
Local Businesses and Citizens of Pondera County

To obtain original copies of this plan contact:

Pondera County Commissioner's Office
Pondera County Courthouse
20 4th Avenue SW
Conrad, Montana 59425

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Chapter I: Overview of this Plan and its Development

1 Introduction

This Community Wildfire Protection Plan for Pondera County, Montana, is the result of analyses, professional cooperation and collaboration, assessments of wildfire risks and other factors considered with the intent to reduce the potential for wildfires to threaten people, structures, infrastructure, and unique ecosystems in Pondera County, Montana. This Community Wildfire Protection Plan is an amendment to the Pondera County Pre-Disaster Mitigation Plan. The Pondera County Commissioners led the planning team responsible for implementing this project. Agencies and organizations that participated in the planning process included:

- Pondera County Commissioners and County Departments
- Pondera County Disaster and Emergency Services
- Montana Department of Natural Resources and Conservation
- USDI Bureau of Land Management
- USDA Forest Service
- USDI Bureau of Reclamation
- Pondera County Fire District
- City of Conrad
- Town of Valier
- Community of Brady
- Community of Dupuyer
- Community of Heart Butte
- North Central Montana Resource Conservation and Development Council
- Montana Disaster and Emergency Services
- Northwest Management, Inc.

The Pondera County Commissioners and the North Central Montana Resource Conservation and Development Council (RC&D) solicited competitive bids from companies to provide the service of leading the assessment and the writing of the **Pondera County Community Wildfire Protection Plan**. The Commissioners and the RC&D selected Northwest Management, Inc. to provide this service. Northwest Management, Inc. is a professional natural resources consulting firm with an office in Helena, Montana. Established in 1984, NMI provides natural resource management services across the USA. The Project Co-Managers from Northwest Management, Inc. were Tera King and Dr. William Schlosser.

1.1 Goals and Guiding Principles

1.1.1 Federal Emergency Management Agency Philosophy

Effective November 1, 2004, a Local Hazard Mitigation Plan approved by the Federal Emergency Management Agency (FEMA) is required for Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Program (PDM) eligibility. The HMGP and PDM program provide funding, through state emergency management agencies, to support local mitigation planning and projects to reduce potential disaster damages.

The new local hazard mitigation plan requirements for HMGP and PDM eligibility is based on the Disaster Mitigation Act of 2000, which amended the Stafford Disaster Relief Act to promote an integrated, cost effective approach to mitigation. Local hazard mitigation plans must meet the minimum requirements of the Stafford Act-Section 322, as outlined in the criteria contained in 44 CFR Part 201. The plan criteria cover the planning process, risk assessment, mitigation strategy, plan maintenance, and adoption requirements.

FEMA will only review a local hazard mitigation plan submitted through the appropriate State Hazard Mitigation Officer (SHMO). Draft versions of local hazard mitigation plans will not be reviewed by FEMA. FEMA will review the final version of a plan prior to local adoption to determine if the plan meets the criteria, but FEMA will be unable to approve it prior to adoption. In Montana the SHMO is:

Montana Disaster and Emergency Services
P.O. Box 4789 - 1900 Williams Street
Helena, Montana 59604-4789
Dan McGowen, 841-3911 - FAX: 841-3965

A FEMA designed plan will be evaluated on its adherence to a variety of criteria.

- Adoption by the Local Governing Body
- Multi-jurisdictional Plan Adoption
- Multi-jurisdictional Planning Participation
- Documentation of Planning Process
- Identifying Hazards
- Profiling Hazard Events
- Assessing Vulnerability: Identifying Assets
- Assessing Vulnerability: Estimating Potential Losses
- Assessing Vulnerability: Analyzing Development Trends
- Multi-Jurisdictional Risk Assessment
- Local Hazard Mitigation Goals
- Identification and Analysis of Mitigation Measures
- Implementation of Mitigation Measures
- Multi-Jurisdictional Mitigation Strategy
- Monitoring, Evaluating, and Updating the Plan
- Implementation Through Existing Programs
- Continued Public Involvement

1.1.2 Additional State and Federal Guidelines Adopted

The Community Wildfire Protection Plan will include compatibility with FEMA requirements while also adhering to the guidelines proposed in the National Fire Plan and the Healthy Forests

Restoration Act (2004). This Community Wildfire Protection Plan has been prepared in compliance with:

- The National Fire Plan; A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan–May 2002.
- Northern Rockies Coordinating Group
- Healthy Forests Restoration Act (2004)
- The Federal Emergency Management Agency's guidelines for a Local Hazard Mitigation Plan as defined in 44 CFR parts 201 and 206, and as related to a fire mitigation plan chapter of a Natural Hazards Mitigation Plan.

"When implemented, the 10-Year Comprehensive Strategy will contribute to reducing the risks of wildfire to communities and the environment by building collaboration at all levels of government."
- The NFP 10-Year Comprehensive Strategy August 2001

The objective of combining these four complimentary guidelines is to facilitate an integrated wildland fire risk assessment, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Pondera County while facilitating new opportunities for pre-disaster mitigation funding and cooperation.

1.1.2.1 National Fire Plan

The goals of this Community Wildfire Protection Plan include:

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

Its three guiding principles are:

1. Priority setting that emphasizes the protection of communities and other high-priority watersheds at-risk.
2. Collaboration among governments and broadly representative stakeholders
3. Accountability through performance measures and monitoring for results.

This Community Wildfire Protection Plan fulfills the National Fire Plan's 10-Year Comprehensive Strategy. The projects and activities recommended under this plan are in addition to other Federal, state, and private / corporate forest and rangeland management activities. The implementation plan does not alter, diminish, or expand the existing jurisdiction, statutory and regulatory responsibilities and authorities or budget processes of participating Federal, State, and tribal agencies.

By endorsing this implementation plan, all signed parties agree that reducing the threat of wildland fire to people, communities, and ecosystems will require:

- Firefighter and public safety continuing as the highest priority.

- A sustained, long-term and cost-effective investment of resources by all public and private parties, recognizing overall budget parameters affecting Federal, State, Tribal, and local governments.
- A unified effort to implement the collaborative framework called for in the Strategy in a manner that ensures timely decisions at each level.
- Accountability for measuring and monitoring performance and outcomes, and a commitment to factoring findings into future decision making activities.
- The achievement of national goals through action at the local level with particular attention on the unique needs of cross-boundary efforts and the importance of funding on-the-ground activities.
- Communities and individuals in the wildland-urban interface to initiate personal stewardship and volunteer actions that will reduce wildland fire risks.
- Management activities, both in the wildland-urban interface and in at-risk areas across the broader landscape.
- Active forestland and rangeland management, including thinning that produces commercial or pre-commercial products, biomass removal and utilization, prescribed fire and other fuels reduction tools to simultaneously meet long-term ecological, economic, and community objectives.

The National Fire Plan identifies a three-tiered organization structure including 1) the local level, 2) state/regional and tribal level, and 3) the national level. This plan adheres to the collaboration and outcomes consistent with a local level plan. Local level collaboration involves participants with direct responsibility for management decisions affecting public and/or private land and resources, fire protection responsibilities, or good working knowledge and interest in local resources. Participants in this planning process include Tribal representatives, local representatives from Federal and State agencies, local governments, landowners and other stakeholders, and community-based groups with a demonstrated commitment to achieving the strategy's four goals. Existing resource advisory committees, watershed councils, or other collaborative entities may serve to achieve coordination at this level. Local involvement, expected to be broadly representative, is a primary source of planning, project prioritization, and resource allocation and coordination at the local level. The role of the private citizen is not to be underestimated, as their input and contribution to all phases of risk assessments, mitigation activities, and project implementation is greatly facilitated by their involvement.

1.1.2.1.1 Montana's Endorsement of the National Fire Plan

In May 2002, Montana Governor Martz, as a member of the Western Governors' Association, helped develop the *10-Year Comprehensive Strategy* and an implementation plan, titled *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment*. With the Western Governors' Association endorsement of the Implementation plan, Montana adopted the national implementation plan as its own.

NFP funding to the states occurs under the community assistance point and is made available through the USFS, state, and private forestry programs. DNRC has responsibility for delivery of these programs on state-owned and private lands in Montana. NFP funding can also come directly from Department of Interior agencies.

The DNRC NFP Program is implemented primarily within the Forestry Division's Fire and Aviation Management Bureau (FAMB) and Service Forestry Bureau (SFB). The National Fire

Plan is delivered, wherever appropriate, through existing state and private forestry programs. These programs are:

- County Cooperative Fire Program (FAMB)
- State Fire Assistance Program (FAMB)
- Private Forestry Assistance Program (SFB)
- Stewardship Program (SFB)

The Volunteer and Rural Fire Assistance (VFA/RFA) Program provides assistance to county fire agencies for equipment, training, and fire prevention materials. Adding National Fire Plan funding resulted in a grant program with more money than ever before. Again in 2003, the Department of the Interior agencies (FWS, BIA, & BLM) contributed their budgeted Rural Fire Assistance Program dollars to be combined with the Volunteer Fire Assistance funds granted by the USDA Forest Service. The total assistance available in Montana exceeded $1.1 million in 2003. DNRC and its partners were recognized with the Ben Franklin Award, given by the Forest Service annually to one state for excellence in delivering these programs.

1.1.2.2 Northern Rockies Coordinating Group

The Northern Rockies Coordination Group (NRCG) was established to provide an interagency approach to wildland fire management and all-risk support on all land ownerships within the States of Montana, North Dakota, northern Idaho, and a small portion of South Dakota and Wyoming. NRCG is made up of representatives from the Montana Fire Warden's Association, Montana Disaster and Emergency Services Division, Montana Department of Natural Resources and Conservation, Idaho Department of Lands, North Dakota Forest Service, Bureau of Land Management, National Park Service, Bureau of Indian Affairs, Fish and Wildlife Service, Forest Service, Montana Fire Chief's Association, and Montana Sheriff's and Peace Officer's Association. The purpose of NRCG is to further interagency cooperation, communications, coordination, and to provide interagency fire management direction and all-risk support for the Northern Rockies Geographic Area.

1.1.2.2.1 County Wildland Fire Interagency Planning Committee

Each County within the state has been requested to write a Community Wildfire Protection Plan. These plans should contain at least the following five elements:

1) Documentation of the process used to develop the mitigation plan. How the plan was developed, who was involved and how the public was involved.
2) A risk assessment to identify vulnerabilities to wildfire in the wildland-urban interface (WUI).
3) A prioritized mitigation strategy that addresses each of the risks. Examples of these strategies could be: training for fire departments, public education, hazardous fuel treatments, equipment, communications, additional planning, new facilities, infrastructure improvements, code and/or ordinance revision, volunteer efforts, evacuation plans, etc.
4) A process for maintenance of the plan which will include monitoring and evaluation of mitigation activities
5) Documentation that the plan has been formally adopted by the involved agencies.

This five-element plan is an abbreviated version of the FEMA mitigation plan and will be an amendment to the Pondera County Pre Disaster Mitigation Plan. To develop these plans each

county should bring together the following individuals, as appropriate for each county, to make up the County Wildland Fire Interagency Planning Committee. It is important that this group has representation from agencies with wildland fire suppression responsibilities such as:

- County Commissioners (Lead)
- Local Fire Chiefs
- Montana Department of Natural Resources and Conservation representative
- USDA Forest Service representative
- USDI Bureau of Land Management representative
- US Fish and Wildlife representative
- Bureau of Indian Affairs
- Local Tribal leaders
- Division of Disaster and Emergency Services
- LEPC Chairperson
- Resource Conservation and Development representative
- State Fish and Game representative
- Interested citizens and community leaders as appropriate
- Other officials as appropriate

1.1.2.3 National Association of State Foresters

1.1.2.3.1 Identifying and Prioritizing Communities at Risk

This plan is written with the intent to provide the information necessary for decision makers (elected officials) to make informed decisions in order to prioritize projects across the entire county. These decisions may be made from within the Board of Commissioners, or through the recommendations of ad hoc groups tasked with making prioritized lists of projects. It is not necessary to rank projects numerically, although that is one approach, rather it may be possible to rank them categorically (high priority set, medium priority set, and so forth) and still accomplish the goals and objectives set forth in this planning document.

The following was prepared by the National Association of State Foresters (NASF), June 27, 2003, and is included here as a reference for the identification of prioritizing treatments between communities.

Purpose: To provide national, uniform guidance for implementing the provisions of the "Collaborative Fuels Treatment" MOU, and to satisfy the requirements of Task e, Goal 4 of the Implementation Plan for the 10-Year Comprehensive Strategy.

Intent: The intent is to establish broad, nationally compatible standards for identifying and prioritizing communities at risk, while allowing for maximum flexibility at the state and regional level. Three basic premises are:

- Include all lands and all ownerships.
- Use a collaborative process that is consistent with the complexity of land ownership patterns, resource management issues, and the number of interested stakeholders.
- Set priorities by evaluating projects, not by ranking communities.

The National Association of State Foresters (NASF) set forth the following guidelines in the Final Draft Concept Paper; Communities at Risk, December 2, 2002.

Task: Develop a definition for "communities at risk" and a process for prioritizing them, per the Implementation Plan for the 10-Year Comprehensive Strategy (Goal 4.e.). In addition, this

definition will form the foundation for the NASF commitment to annually identify priority fuels reduction and ecosystem restoration projects in the proposed MOU with the federal agencies (section C.2 (b)).

1.1.2.3.2 Conceptual Approach

1. NASF fully supports the definition of the Wildland Urban Interface (WUI) previously published in the Federal Register. Further, proximity to federal lands should not be a consideration. The WUI is a set of conditions that exists on, or near, areas of wildland fuels nation-wide, regardless of land ownership.
2. Communities at risk (or, alternately, landscapes of similar risk) should be identified on a state-by-state basis with the involvement of all agencies with wildland fire protection responsibilities: state, local, tribal, and federal.
3. It is neither reasonable nor feasible to attempt to prioritize communities on a rank order basis. Rather, communities (or landscapes) should be sorted into three, broad categories or zones of risk: high, medium, and low. Each state, in collaboration with its local partners, will develop the specific criteria it will use to sort communities or landscapes into the three categories. NASF recommends using the publication "Wildland/Urban Interface Fire Hazard Assessment Methodology" developed by the National Wildland/Urban Interface Fire Protection Program (circa 1998) as a reference guide. (This program, which has since evolved into the Firewise Program, is under the oversight of the National Wildfire Coordinating Group (NWCG)). At minimum, states should consider the following factors when assessing the relative degree of exposure each community (landscape) faces.
    - **Risk:** Using historic fire occurrence records and other factors, assess the anticipated probability of a wildfire ignition.
    - **Hazard:** Assess the fuel conditions surrounding the community using a methodology such as fire condition class, or [other] process.
    - **Values Protected:** Evaluate the human values associated with the community or landscape, such as homes, businesses, and community infrastructure (e.g. water systems, utilities, transportation systems, critical care facilities, schools, manufacturing and industrial sites, and high value commercial timber lands).
    - **Protection Capabilities:** Assess the wildland fire protection capabilities of the agencies and local fire departments with jurisdiction.
4. Prioritize by project not by community. Annually prioritize projects within each state using the collaborative process defined in the national, interagency MOU "For the Development of a Collaborative Fuels Treatment Program". Assign the highest priorities to projects that will provide the greatest benefits either on the landscape or to communities. Attempt to properly sequence treatments on the landscape by working first around and within communities, and then moving further out into the surrounding landscape. This will require:
    - First, focus on the zone of highest overall risk but consider projects in all zones. Identify a set of projects that will effectively reduce the level of risk to communities within the zone.
    - Second, determine the community's willingness and readiness to actively participate in an identified project.

- Third, determine the willingness and ability of the owner of the surrounding land to undertake, and maintain, a complementary project.
- Last, set priorities by looking for projects that best meet the three criteria above. It is important to note that projects with the greatest potential to reduce risk to communities and the landscape may not be those in the highest risk zone, particularly if either the community or the surrounding landowner is not willing or able to actively participate.

5. It is important, and necessary, that we be able to demonstrate a level of accomplishment that justifies to Congress the value of continuing the current level of appropriations for the National Fire Plan. Although appealing to appropriators and others, it is not likely that many communities (if any) will ever be removed from the list of communities at risk. Even after treatment, all communities will remain at some, albeit reduced, level of risk. However, by using a science-based system for measuring relative risk, we can likely show that, after treatment (or a series of treatments); communities are at "*reduced risk*".

Similarly, scattered, individual homes that complete projects to create defensible space could be "counted" as "households at reduced risk". This would be a way to report progress in reducing risk to scattered homes in areas of low priority for large-scale fuels treatment projects.

Using the concept described above, the NASF believes it is possible to accurately assess the relative risk that communities face from wildland fire. Recognizing that the condition of the vegetation (fuel) on the landscape is dynamic, assessments and re-assessments must be done on a state-by-state basis, using a process that allows for the integration of local knowledge, conditions, and circumstances, with science-based national guidelines. We must remember that it is not only important to lower the risk to communities, but once the risk has been reduced, to maintain those communities at a reduced risk.

Further, it is essential that both the assessment process and the prioritization of projects be done collaboratively, with all local agencies with fire protection jurisdiction – federal, state, local, and tribal – taking an active role.

1.1.2.4 Healthy Forests Restoration Act

On December 3, 2003, President Bush signed into law the Healthy Forests Restoration Act of 2003 to reduce the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes. The legislation is based on sound science and helps further the President's Healthy Forests Initiative pledge to care for America's forests and rangelands, reduce the risk of catastrophic fire to communities, help save the lives of firefighters and citizens, and protect threatened and endangered species.

Among other things the Healthy Forests Restoration Act (HFRA):

- Strengthens public participation in developing high priority projects;
- Reduces the complexity of environmental analysis allowing federal land agencies to use the best science available to actively manage land under their protection;
- Creates a pre-decisional objections process encouraging early public participation in project planning; and
- Issues clear guidance for court action challenging HFRA projects.

The Pondera County Community Wildfire Protection Plan is developed to adhere to the principles of the HFRA while providing recommendations consistent with the policy document

which should assist the federal land management agencies (US Forest Service and Bureau of Land Management) with implementing wildfire mitigation projects in Pondera County that incorporate public involvement and the input from a wide spectrum of fire and emergency services providers in the region.

1.1.3 Local Guidelines and Integration with Other Efforts

1.1.3.1 Pondera County Fire Mitigation Planning Effort and Philosophy

The goals of this planning process include the integration of the National Fire Plan, the Western Governors Association Implementation Strategy, the Healthy Forests Restoration Act, and the requirements of FEMA for a countywide Community Wildfire Protection Plan, a component of the County's Pre-Disaster Mitigation Plan. This effort will utilize the best and most appropriate science from all partners, the integration of local and regional knowledge about wildfire risks and fire behavior, while meeting the needs of local citizens, the regional economy, the significance of this region to the rest of Montana and the Inland West.

1.1.3.1.1 Mission Statement

To make Pondera County residents, communities, state agencies, local governments, and businesses less vulnerable to the negative effects of wildland fires through the effective administration of wildfire hazard mitigation grant programs, hazard risk assessments, wise and efficient fuels treatments, and a coordinated approach to mitigation policy through federal, state, regional, and local planning efforts. Our combined prioritization will be the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.

1.1.3.1.2 Vision Statement

Institutionalize and promote a countywide wildfire hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Pondera County

1.1.3.1.3 Goals

- To reduce the area of WUI land burned and losses experienced because of wildfires where these fires threaten communities in the wildland-urban interface
- Prioritize the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy
- To provide a plan that will not diminish the private property rights of landowners in Pondera County
- Educate communities about the unique challenges of wildfire in the wildland-urban interface (WUI)
- Establish mitigation priorities and develop mitigation strategies in Pondera County
- Strategically locate and plan fuel reduction projects
- Provide recommendations for alternative treatment methods, such as modifying brush stand density, herbicide treatments, fuel reduction techniques, and disposal or removal of treated vegetation.
- Meet or exceed the requirements of the National Fire Plan and FEMA for a County level Community Wildfire Protection Plan

1.1.3.2 Pondera County Pre-Disaster Mitigation Plan

The effects from natural and man-made hazards directly impact the safety and well being of Pondera County residents. Historically, drought, floods, severe summer thunderstorms producing hail and tornadoes, harsh winter storms with extreme cold and blizzards, wildfires, windstorms, volcanic ashfall and hazardous material spills have all occurred. Although few of these hazards can be eliminated, the effects from them can be mitigated.

Many groups and individuals contributed to development of the Pondera County Pre-Disaster Mitigation Plan. The DES Coordinators for Pondera, Glacier, Toole and Liberty Counties, functioning as a steering committee, provided significant guidance and support in all aspects of plan development. The National Weather Service provided historic newspaper accounts of severe weather events and other weather data. Some of the maps included in the plan were provided by the Montana State Library. Numerous elected officials, city and county personnel, and local communities participated in the planning process and contributed significantly to the Pre-Disaster Mitigation Plan's development.

Chapter 2: Planning Process

2 Documenting the Planning Process

Documentation of the planning process, including public involvement, is required to meet FEMA's DMA 2000 (44CFR§201.4(c)(1) and §201.6(c)(1)). This section includes a description of the planning process used to develop this plan, including how it was prepared, who was involved in the process, and how all of the involved agencies participated.

2.1 Description of the Planning Process

The Pondera County Community Wildfire Protection Plan was developed through a collaborative process involving all of the organizations and agencies detailed in Section 1.0 of this document. The County's local coordinator contacted these organizations directly to invite their participation and schedule meetings of the planning committee. The planning process included 5 distinct phases which were in some cases sequential (step 1 then step 2) and in some cases intermixed (step 4 completed though out the process):

1. **Collection of Data** about the extent and periodicity of wildfires in and around Pondera County. This included an area encompassing Glacier, Toole, Liberty, and Teton Counties to insure a robust dataset for making inferences about fires in Pondera County specifically; this included a wildfire extent and ignition profile.
2. **Field Observations and Estimations** about wildfire risks including fuels assessments, juxtaposition of structures and infrastructure to wildland fuels, access, and potential treatments by trained wildfire specialists.
3. **Mapping** of data relevant to wildfire control and treatments, structures, resource values, infrastructure, fire prone landscapes, and related data.
4. **Facilitation of Public Involvement** from the formation of the planning committee, to a public mail survey, news releases, public meetings, public review of draft documents, and acceptance of the final plan by the signatory representatives.
5. **Analysis and Drafting of the Report** to integrate the results of the planning process, providing ample review and integration of committee and public input, followed by acceptance of the final document.

2.2 The Planning Team

Planning efforts were led by the Project Co-Managers, Tera R. King and Dr. William Schlosser of Northwest Management, Inc. Dr. Schlosser's education includes 4 degrees in natural resource management (A.S. geology; B.S. forest and range management; M.S. natural resource economics & finance; Ph.D. environmental science and regional planning). Mrs. King holds a bachelor's degree in Forest Resource Management.

They led a team of resource professionals, city and rural fire protection, county departments, U.S. Forest Service, Montana Department of Natural Resources and Conservation, the Bureau of Land Management, and the North Central Montana RC&D; also included were fire mitigation specialists, resource management professionals, and hazard mitigation experts.

The planning team met with many residents of the county during the inspections of communities, infrastructure, and hazard abatement assessments. This methodology, when

coupled with the other approaches in this process, worked adequately to integrate a wide spectrum of observations and interpretations about the project.

The planning philosophy employed in this project included the open and free sharing of information with interested parties. Information from federal and state agencies was integrated into the database of knowledge used in this project. Meetings with the committee were held throughout the planning process to facilitate a sharing of information between cooperators.

When the public meetings were held, several of the committee members were in attendance and shared their support and experiences with the planning process and their interpretations of the results.

2.2.1 Multi-Jurisdictional Participation

CFR requirement §201.6(a)(3) calls for multi-jurisdictional planning in the development of community wildfire protection plans which impact multiple jurisdictions. This Community Wildfire Protection Plan is applicable to the following jurisdictions:

- Pondera County, Montana
- City of Conrad
- Town of Valier

All of these jurisdictions were represented on the planning committee and participated in the development of hazard profiles, risk assessments, and mitigation measures. The monthly planning committee meetings were the primary venue for authenticating the planning record. However, additional input was gathered from each jurisdiction in a combination of the following ways:

- Planning committee leadership visits to scheduled municipality public meeting (e.g., County Commission meetings, City Hall meetings) where planning updates were provided and information was exchanged.
- One-on-one visits between the planning committee leadership and the representatives of the municipality (e.g., meetings with County Commissioners, or City Councils in chambers).
- Special meetings at each jurisdiction by the planning committee leadership requested by the municipality involving elected officials (Mayor and County Commissioners, County Assessor, Sheriff), appointed officials (e.g. City Police, Disaster and Emergency Services Director), municipality employees, local volunteers (e.g., fire district volunteers), business community representatives, and local citizenry.
- Written correspondence was provided monthly between the planning committee leadership and each municipality updating the cooperators in the planning process, making requests for information, and facilitating feedback.

Planning committee leadership (referenced above) included: Cindy Mullaney, Pondera County Emergency Management Coordinator, Tera King of Northwest Management, Inc., Shannon Downey from the Bureau of Land Management, Dennis Devries with the North Central Montana RC&D, and all three of the Pondera County Commissioners.

Like other rural areas of Montana and the USA, Pondera County's human resources have many demands put on them in terms of time and availability. Recognizing this, many of the jurisdictions decided to identify a representative from the jurisdiction to cooperate on the planning committee and then report back to the remainder of their organization on the process and serve as a conduit between the planning committee and the jurisdiction.

2.2.2 Committee Meetings

The following list of people who participated in the planning committee meetings, volunteered time, or responded to elements of the Pondera County Community Wildfire Protection Plan's preparation.

NAME	ORGANIZATION
• Brad McBratney	U.S. Forest Service
• Cynthia Johnson	Pondera County Commissioner
• Dan Picard	Pondera County Extension Agent
• Dennis Devries	North Central RC&D
• Erik Eneboe	Montana Department of Natural Resources and Conservation
• Jeff Pruttis	Pondera County Sheriff's Office
• Joe Christiaens	Pondera County Commissioner
• John P. Shevlin	City of Conrad
• LeAnn Hermance	Pondera County Public Health
• Sandra Broesder	Pondera County Commissioner
• Shannon Downey	Bureau of Land Management
• Tera King	Northwest Management, Inc.
• Tom Kuka	Pondera County Sheriff
• Cindy Mullaney	Pondera County Emergency Management

2.2.2.1 Committee Meeting Notes

Committee Meetings were scheduled and held on the dates indicated with each entry. This information is useful to observe what topics were discussed, who participated, and the source of recommendations made in this planning process.

2.2.2.1.1 September 14th, 2006 – Pondera County Courthouse

Agenda Item #1 – Introduction and Sign In:

1300 hours; Cindy Mullaney made introductions as committee members came into the meeting room. Tera sent around the Sign In sheet and began by giving some background on Northwest Management, Inc.

Agenda Item #2 – Overview of Process:

Tera gave a short powerpoint presentation on some of the highlights of the CWPP planning process, guidelines, benefits, and committee responsibilities. She explained that she had spent some time in August driving around getting familiar with Pondera County and would be handing out community assessment write ups at the next committee meeting. These write ups are a windshield overview of each community and it is the committee's job to review them for completeness and accuracy.

Tera handed out a tentative timeline for completion of the CWPP. It was decided that the next Pondera County committee meeting would be on October 2nd at 4:30 pm. After the October meeting, committee meetings will occur once a month. It is the intent of the committee to present a public meeting while wildland fire is still on people's minds. The committee has scheduled a public meeting in Conrad (Courthouse Courtroom) for October 11th at 7 pm and an additional meeting in Valier (possibly at the Fire Hall) on October 11th at 12:15 pm. Tera will bring the materials for the meetings, but it is the committee's responsibility to attend and provide support as well as help spread the word around about the meeting. The committee also thought

that it was important to make an effort to get Heart Butte involved. Tera will try to schedule a time to meet with Frances Wild Gun, the Heart Butte Fire Department Chief.

Agenda Item #3 – Mission, Vision, and Goals Statements:

Tera handed out a draft version of a potential mission, vision, and goals statement. She asked that the committee review this and provide comments by the next committee meeting.

Agenda Item #4 – Public Survey and Press Releases:

Tera handed out drafts of the public survey and press release. She asked that the committee review and make edits now as Northwest Management would like to get those out as soon as possible. The committee would like to add a saying that the BLM was providing funding for the CWPP process to the press release. The *Valierian* and the *Independent Observer* are the only local publications. Brian and Leanne Cavanaugh are the contacts for the *Valierian*. The committee made minor changes to the wording of some of the questions on the public survey as well as added a question regarding homes' proximity to CRP, no-till, or tall grass.

Agenda Item #5 – Resources and Capabilities Questionnaires:

Tera handed out an example of the Resources and Capabilities questionnaire which she will be asking all of the local fire departments and fire response agencies in the county to fill out. She explained the importance of having this information in the document. She also noted that it was imperative to the plan the fire departments establish a "needs" list to be included in the mitigation activities recommended in the plan. Tera will work with Cindy to get the questionnaire out to the fire departments.

Agenda Item #6 – Mapping Products:

Northwest Management, Inc. presented some of the mapping products they have been able to prepare to-date. These included a Fire Regime Condition Class analysis, a Historic Fire Regime analysis, and a Fire Districts map. Tera asked that the committee take a look at the maps to check for accuracy of data, place names, etc. Commissioner Johnson found that the dam layer was missing data and Commissioner Broesder and Cindy noted that several bodies of water were missing.

Agenda Item #7 – Task List and Assignments:

Information can be sent to Tera King at king@consulting-foresters.com.*

1. Review Mission, Vision, and Goals Statements by next meeting – Committee
2. Send NMI press release edits ASAP – Committee
3. Review public survey and send edits to NMI ASAP – Committee
4. Send Cindy Resources and Capabilities questionnaires electronically – NMI
5. Send Cindy edited press releases - NMI
6. Send NMI NRCS CRP maps - Dennis
7. Fill out Resources and Capabilities questionnaires by next meeting – Fire Departments, Wildfire Agencies, Ambulance Services, etc.
8. Send NMI organization logos by the next meeting - Committee

Agenda Item #8 – Adjournment:

The committee meeting was adjourned at 1500 hours.

Next Meeting: Ocotber 2nd, 2006 in Pondera County Courthouse Basement @ 4:30 pm
Public Meetings: October 11th, 2006
Conrad - Courthouse Courtroom @ 7 pm
Valier – TBA @ 12:15 pm

2.2.2.1.2 October 2nd, 2006 – Pondera County Courthouse

Agenda Item #1 – Introduction and Sign In:

Tera began the meeting by making introductions and passing around the sign in sheet.

Agenda Item #2 – Housekeeping Items:

Tera has not received any changes to the Mission, Vision, and Goals statements handed out at the last meeting; therefore, they will appear in the draft plans as they are. The committee can edit any part of the draft document during the committee review phase.

Tera handed out the edited public survey and explained that unless the committee had additional changes, the surveys would be mailed out next Tuesday. The committee did not have more edits at this time.

Cindy has sent out the Resources and Capabilities surveys to all of the fire departments. So far, none have been returned, but Cindy agreed to send Tera the names and contact information for all the chiefs.

Tera asked that she get copies of any fire-related documents that the county or agencies might currently already have in place. These could include: County Comprehensive Plans, Ordinances, Burn Permit Regulations, MOU info, Logos, etc.

Agenda Item #3 – Public Meetings & Press Releases:

The initial press release appeared in the Valierian, but has not yet been published in the Independent Observer. It is possible that it will be in this week's paper.

Tera handed out the flyer announcing the upcoming public meetings for committee review. She and Cindy will try to get them into the local papers for publication next week, but it might be too late. Tera will email the flyer to all of the committee members for distribution around communities and offices. The public meetings are confirmed for October 11th – 12:15 pm at the Valier Fire Hall and 7 pm at the Pondera County Courthouse in Conrad.

Agenda Item #4 – Community Assessments:

Tera handed out the rough drafts of the community assessments. She explained that these were basically a windshield view of each community and expected the committee to edit them harshly. Edits are due to Tera by October 31st.

Agenda Item #5 – WUI Discussion:

Tera began by explaining the purpose and intent of designating a Wildland Urban Interface in Pondera County and then discussed how NMI had created the proposed WUI shown on the printed map. Brad McBratney with the Forest Service was also able to shed some light on the discussion as several members had questions regarding the ramifications of the WUI boundary. The initial feeling of the committee was that the population density method worked well, but that they would like to see how the public reacted before making a final decision.

Agenda Item #6 – Mitigation Projects and Action Items:

As the last item on the agenda, Tera asked the committee to use the markers to begin identifying potential project areas or areas of high concern. Ledger was discussed as being an area where demolishing and burning some of the old abandoned buildings at the site would be helpful. Fuels reduction by mowing and maintenance of the home site would also help decrease the fire risk. Brad noted that the Forest Service did not have any projects planned or proposed specifically in Pondera County at this time. Most of the communities in the county (Brady was specifically mentioned) would benefit from mowing and/or discing a fuel break

around the perimeter of the townsite. In many cases, grass, fields, and CRP directly abut community buildings. Fuels between I-15 and Conrad are not mown on a regular basis. Weeds are also bad in this area. The Mink Ranch and Linda Walker's place, both located west of Conrad may support higher intensity fires that could easily be blown into town. The community should work to help these and other neighboring residents to reduce fuels on their properties to improve the safety of the town. Fuels around Lake Frances may put the community of Valier and the recreational aspects of the lake at higher fire risk; however, there has not yet been an occurrence of fire in this area. There are also several abandoned or partially unmaintained ball fields in Valier that could contribute to the hazardous fuels complex around the community. Homes or other structures along Dupuyer Creek or Sheep Creek near Dupuyer have some additional risk associated with the higher density fuels in the riparian area. Removal of dead material and thinning of brush could reduce this risk. Brad noted that riparian area fires have the highest risk of occurrence during the months of January, February, and March due to the Chinook winds are coming off the front range. The are high risk rangeland fuels throughout the community of Heart Butte because only a handful of homeowners maintained a groomed and watered lawn. The Heart Butte seems to have difficulty getting funding through the BIA or the Tribe and has asked Pondera County for support. The Heart Butte Fire Department is within Pondera County's rural fire district. The committee would also like to see a wildfire-specific public education campaign. Cindy suggested Firewise as a source of materials and information.

Agenda Item #8 – Task List and Assignments:

Information can be sent to Tera King at king@consulting-foresters.com.**

1. Send NMI copies of MOUs and PDM plan - Cindy
2. Send NMI community assessment edits by October 31st – Committee
3. Send logos, fire-related planning docs, etc to NMI – Committee
4. Send NMI ideas for additional project areas or action items - Committee
5. Continue to work with FSA to get CRP maps – NMI
6. Send NMI Resource and Capabilities surveys – Fire Response Agencies

Agenda Item #9 – Adjournment:

The committee meeting was adjourned at 1800 hours

Next Meeting: November 28th, 2006 in Pondera County Courthouse @ 3 pm
Public Meetings: October 11th, 2006 -- Pondera County Courthouse @ 7 pm
Valier Fire Hall @ 12:15 pm

2.2.2.1.3 November 27th. 2006 – Pondera County Courthouse

Agenda Item #1 – Introduction and Sign In:

Tera made welcoming comments and passed around the sign in sheet. LeAnn explained that Cindy was at a training in Indiana and would not be able to attend.

Agenda Item #2 – Public Survey Update:

Tera reported that the third mailing of the survey had gone out last week. So far, NMI has received approximately 40% response.

Agenda Item #3 – Resource and Capabilities:

Tera reported that she had received the Resources and Capabilities survey from the District; however, the individual departments were not well represented in this assessment. The current summary, which is included in the draft document, does not acknowledge that any of the departments need any kind of training, equipment, etc. Since, this is not likely to be the case,

Tera proposed that the department chiefs go ahead and fill out the survey in order to get a more accurate reporting. John said that he would talk to the Conrad chief to make sure this happened.

Agenda Item #4 – Public Meetings Review:

Tera gave a brief overview of the public meetings. There was approximately six attendees in Valier and about 12 in Conrad. There was also several committee members at each meeting, which improved the quality of the discussions. Tera also noted that while she was in the area doing the public meetings, she had met with the Heart Butte Chief, Francis Wild Gun.

Agenda Item #5 – CWPP Rough Draft Review:

Tera handed out copies of the rough draft CWPP. Although several components are still being developed, this gave the committee a chance to review the formatting and some of the background information. Tera walked through the document explaining some of the sections and answering questions. Much of the wildfire extent and ignition profile information is still missing. The last chapter of the document contains tables outlining specific action item recommendations. The committee went through each of these line items and either edited it to fit the county's needs or delete it altogether. In some cases, the discussions of the action items led to the addition of a recommendation. All of the committees suggested edits will be incorporated into the more complete draft to be prepared for the next meeting.

Agenda Item #6 – CRP Mapping:

Per several discussions both Tera and Dennis has had with the Farm Service Agency, it is fairly clear that maps of the fields currently enrolled in the CRP program are not going to be made available to this committee in the near future. Thus, NMI has come up with a way of using aerial photography and existing vegetation layers to come up with an estimate. Although, this model will include some unharvested rangelands, it should give a fairly clear picture of where there are continuous high risk fuels in the county. This map should be ready for review by the next committee meeting.

Agenda Item #7 – Fire Occurrence History:

NMI has access to fire history data on federal, state, and tribal lands in the County. In order to complete a detailed fire risk analysis, they would also like to gather information on private lands, particularly because the majority of the county is privately held. Tera is working with Cindy to try to come up with this information. Tera noted that obtaining information from the State Fire Marshal's office is nearly impossible and not very helpful. The information they are looking for would include a date, location, acres, and cause for each fire.

Agenda Item #8 – Task List and Assignments:

Information can be sent to Tera King at king@consulting-foresters.com.*

1. Work with Cindy to develop fire history – NMI, Cindy, and Fire Departments
2. Review rough draft and send edits to NMI
3. Fill out Resources and Capabilities questionnaires by next meeting – Fire Departments, Wildfire Agencies, etc.
4. Send NMI organization logos by the next meeting - Committee

Agenda Item #9 – Adjournment:

The committee meeting was adjourned at 1100 hours.

Next Meeting: January 17th, 2007 @ 9 am in the Courthouse basement

2.2.2.1.4 January 23rd, 2007 – Pondera County Courthouse

Agenda Item #1 – Introduction and Sign In:

Tera made welcoming comments and passed around the sign in sheet.

Agenda Item #2 – Resources and Capabilities:

Tera reported that she was still missing the Resource and Capabilities summaries from several of the individual fire departments. Dan offered to track down the Brady Fire Department information. Tera has contacted several of the departments to at least get some "Needs" information that she will incorporate into the document.

The rural fire district has hard copy records of past fires in the county; however, it would take too much time to compile summaries of these. Cindy thought that she could summarize how many fires each department responded to in 2006.

Agenda Item #3 – CWPP Draft Update:

Tera reviewed the updated and edited portions of the committee draft document, particularly noting the inclusion of the wildfire analysis information as well as the prioritization of the recommendations. Tera will be contacting Malmstrom Air Force Base to get some information on the protection of missile silos in Pondera County. She asked that the committee review the completed document and provide any additional edits by February 20th.

Agenda Item #4 – Appendices Review:

Tera handed out the completed committee draft of the Appendices, which includes document maps, the survey information, and prioritization scores as well as additional info on training and funding sources. She asked that the committee review this document by February 20th.

Agenda Item #5 – Prioritization:

To be FEMA compliant, the CWPP must have a prioritization scheme outlined. Tera reviewed the numerical scheme used to create the "High", "Medium", or "Low" ranking of all the project recommendations. She also went over the Excel spreadsheet she created to assist the County with scoring and ranking future projects. The committee agreed that this prioritization scheme would work and was repeatable when the plan was updated.

Agenda Item #6 – Mapping:

Tera presented the committee with two new maps; Fire Prone Landscapes and CRP areas. The Fire Prone Landscapes map is a model illustrating potentially high ignition prone areas based on past fires, aspect, CRP, slope, road density, and stream density. The committee felt that the analysis was easily understood and seemed fairly accurate. The CRP map was based off of satellite imagery and cover types. Although many CRP fields were picked up, it did not pick up as much as it should. The committee suggested that Tera and Dennis take the map to the local USDA Center and see if their personnel could augment the information.

Agenda Item #7 – Task List and Assignments:

Information can be sent to Tera King at king@consulting-foresters.com.*

1. Work with Cindy to develop fire history – NMI, Cindy, and Fire Departments
2. Review committee draft and send edits to NMI - Committee
3. Fill out Resources and Capabilities questionnaires – Fire Departments
4. Continue to work on CRP map - NMI

Agenda Item #8 – Adjournment:

The committee meeting was adjourned at 1600 hours.

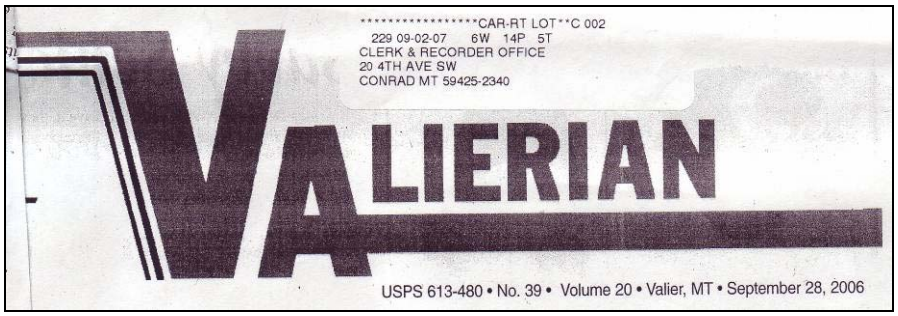
2.3 Public Involvement

Public involvement in this plan was made a priority from the inception of the project. There were a number of ways that public involvement was sought and facilitated. In some cases this led to members of the public providing information and seeking an active role in protecting their own homes and businesses, while in other cases it led to the public becoming more aware of the process without becoming directly involved.

2.3.1 News Releases

Under the auspices of the Pondera County Community Wildfire Protection Plan Committee, news releases were submitted to the local newspapers, broadcasted on the local radio station, and distributed around communities by members of the planning committee. The following is an example of one of the press releases submitted during the planning process.

Figure 2.1. *Valierian* article published September 8th, 2006.



Pondera County plans to mitigate wildfire risk

The Pondera County Commissioners have created a planning committee to complete a Community Wildfire Protection Plan for Pondera County as part of the National Fire Plan and Healthy Forests Restoration Act as authorized by Congress and the White House. The Community Wildfire Protection Plan project, funded through a grant from the Bureau of Land Management (BLM), will include risk analysis at the community level with predictive models for where fires are likely to ignite and where they are likely to spread rapidly once ignited. Northwest Management, Inc. has been retained by Pondera County to provide wildfire risk assessments, mapping, field inspections, interviews, and to collaborate with the committee to prepare the plan. The committee includes rural and wildland fire districts, land managers, city and county elected officials, agency representatives, community organizations, and many others. Northwest Management, Inc. specialists are conducting analysis of fire prone landscapes and making recommendations for potential treatments. Specific activities for homes, structures, infrastructure, and resource capabilities will be proposed as part of the analysis.

One of the most important steps in gathering information about fire risk in Pondera County is to conduct a homeowner's survey. Northwest Management, Inc., in cooperation with local fire officials and Pondera County, will mail a brief survey to randomly selected homeowners in the county (including Conrad and Valier) seeking input about home construction materials, proximity to water sources, and other risk factors surrounding homes. This survey is very important to the success of the plan. Those homeowners that receive a survey are asked to please take the time to complete it, thereby benefiting the community overall.

The planning team will be conducting public meetings to discuss preliminary findings and to seek public involvement in the planning process. These meetings will take place Wednesday, Oct. 11, 2006. The Conrad public meeting will be in the Pondera County Courthouse Courtroom at 7 p.m. and the Valier public meeting will be in the Valier Fire Hall at 12:15 p.m.

For more information on the Community Wildfire Protection Plan in Pondera County contact Cindy Mullaney, Pondera County Disaster and Emergency Services Coordinator, at 406-271-4040 or William Schlosser at the Northwest Management, Inc. office in Moscow, Idaho at 208-883-4488.

2.3.2 Public Mail Survey

In order to collect a broad base of perceptions about wildland fire and individual risk factors of homeowners in Pondera County a mail survey was conducted. The survey was completed during 2006. Using the cadastral database of landowners in Pondera County, homeowners from the county were identified. Two hundred six residents of Pondera County were randomly selected to receive mail surveys.

The public mail survey developed for this project has been used in the past by Northwest Management, Inc. during the execution of other Hazard Mitigation Plans. The survey used The Dillman Total Design Method (Dillman 1978) as a model to schedule the timing and content of letters sent to the selected recipients. Copies of each cover letter, mail survey, and communication are included in the Appendices.

The first in the series of mailings was sent October 19th, 2006, and included a cover letter, a survey, and an offer of receiving a custom GIS map of the area of their selection in Pondera

County if they would complete and return the survey. The free map incentive was tied into assisting their community and helping their interests by participating in this process. Each letter also informed residents about the planning process. A return self-addressed enveloped was included in each packet. A postcard reminder was sent to the non-respondents on November 8th, 2006, encouraging their response. A final mailing, with a revised cover letter urging with them to participate, was sent to non-respondents on November 16th, 2006.

Surveys were returned during the months of October, November, and December. A total of 99 residents responded to the survey as of January 16th, 2006. The effective response rate for this survey was 48%. Statistically, this response rate allows the interpretation of all of the response variables significantly at the 99% confidence level.

2.3.2.1 Survey Results

A summary of the survey's results will be presented here and then referred back to during the ensuing discussions on the need for various treatments, education, and other information.

Of the 99 respondents in the survey, approximately 41% were from the Conrad area, 31% were from Valier, 18% were from Brady, 2% from Heart Butte, 1% from Dupuyer, with the remaining respondents from other areas in the county.

The vast majority of the respondents (100%) correctly identified that they have emergency telephone 911 services in their area. When asked if their home was protected by a local fire department approximately 6% *incorrectly* responded that they did not. Of the 92% that said they were protected, 55% said that the average response time by a fire department to their home was less than 10 minutes, 34% thought the average response time was between 10 and 20 minutes, and 11% of respondents thought that a fire department would be there within 20 to 30 minutes.

Respondents were asked to indicate the type of roofing material covering the main structure of their home. Approximately 56% of respondents indicated their homes were covered with a composite material (asphalt shingles). About 20% indicated their homes were covered with a metal (e.g., aluminum, tin) roofing material, and 13% of the respondents indicated they have a wooden roof (e.g. shake, shingle).

When asked if they have trees, shrubs, or a shelterbelt within 250 feet of their home, 96% indicated that they did. About 16% of respondents indicated they had CRP, no till, or tall grass directly adjacent to structures, while 37% said they had structures within 50 to 200 yards, 10% were within 200 and 400 yards, and 38% said they had structures within ¼ mile of CRP, no till, or tall grass. 98% of respondents replied that they had a lawn and 95% of those that had a lawn keep it green year round.

The average driveway length of respondents to the survey was 956 feet long (0.18 miles). The longest reported was five miles. Of those respondents (11%) with a driveway over ½ mile long, about half do not have turnouts allowing two vehicles to pass. 3% of those respondents with a driveway indicated having a dirt surface, while 88% had gravel or rock and 9% had a paved driveway. Approximately 88% of the respondents indicated an alternate escape route was available in an emergency which cuts off their primary driveway access.

100% of respondents indicated they have some type of tools to use against a wildfire that threatens their home. Table 2.1 summarizes these responses.

Table 2.1. Percent of homes with indicated fire fighting tools in Pondera County.

95% – Hand tools (shovel, Pulaski, etc.)

Table 2.1. Percent of homes with indicated fire fighting tools in Pondera County.

37% – Portable water tank

13% – Stationery water tank

30% – Pond, lake, or stream water supply close

32% – Water pump and fire hose

55% - Well or cistern

29% – Equipment suitable for creating fire breaks (bulldozer, cat, skidder, etc.)

Respondents were asked to complete a fuel hazard rating worksheet to assess their home's fire risk rating. The following is an example of the worksheet and a summarization of responses (Table 2.2).

Circle the ratings in each category that best describes your home.

Table 2.2. Fuel Hazard Rating Worksheet		**Rating**	**Results**
Fuel Hazard	Small, light fuels (grasses, forbs, weeds, shrubs)	1	54%
	Medium size fuels (brush, large shrubs, small trees)	2	44%
	Heavy, large fuels (woodlands, timber, heavy brush)	3	2%
Slope Hazard	Mild slopes (0-5%)	1	92%
	Moderate slope (6-20%)	2	6%
	Steep Slopes (21-40%)	3	1%
	Extreme slopes (41% and greater)	4	0%
Structure Hazard	Noncombustible roof and noncombustible siding materials	1	30%
	Noncombustible roof and combustible siding material	3	26%
	Combustible roof and noncombustible siding material	7	10%
	Combustible roof and combustible siding materials	10	33%
Additional Factors	Rough topography that contains several steep canyons or ridges	+2	Average -1.4 pts
	Areas having history of higher than average fire occurrence	+3	
	Areas exposed to severe fire weather and strong winds	+4	
	Areas with existing fuel modifications or usable fire breaks	-3	
	Areas with local facilities (water systems, rural fire departments, dozers)	-3	

Calculating your risk

Values below are the average response value to each question for those living in both rural and urban areas.

Fuel hazard __1.5___ x Slope Hazard ___1.1___ = ____1.65____
Structural hazard + ____5.1__

Additional factors	(+ or -)	-1.4
Total Hazard Points	=	5.35 .

Table 2.3. Percent of respondents in each risk category as determined by the survey respondents.
00% – Extreme Risk = 26 + points
03% – High Risk = 16–25 points
35% – Moderate Risk = 7–15 points
62% – Low Risk = 6 or less points

Respondents were asked a series of questions regarding mitigation activities they had recently done or currently do on their property. The first question asked if they conducted a periodic fuels reduction program near their home; 30% said that they did. Respondents were also asked if livestock was grazed around their home and 38% indicated that there was.

Finally, respondents were asked "If offered in your area, would members of your household attend a free or low cost, one-day training seminar designed to share with homeowners how to reduce the potential for casualty loss surrounding your home?" Almost half, 47% of respondents, indicated a desire to participate in this type of training.

Homeowners were also asked, "How Hazard Mitigation projects should be funded in the areas surrounding homes, communities, and infrastructure such as power lines and major roads?" Responses are summarized in Table 2.4.

Table 2.4. Public Opinion of Hazard Mitigation Funding Preferences.

	100% Public Funding	Cost-Share (Public & Private)	Privately Funded (Owner or Company)
Home Defensibility Projects →	28%	37%	35%
Community Defensibility Projects →	60%	36%	4%
Infrastructure Projects Roads, Bridges, Power Lines, Etc. →	63%	21%	16%

2.3.3 Public Meetings

Public meetings were scheduled on October 11th, 2006 in both Conrad and Valier, during the hazard assessment phase of the planning process. These public meetings were scheduled to share information on the planning process, inform details of the hazard assessments, and discuss potential mitigation treatments. Attendees at the public meetings were asked to give their impressions of the accuracy of the information generated, and provide their opinions of potential treatments.

Figure 2.2. Public meeting slideshow overview.

The public meeting slide show (title slide above) is outlined below.

Table 2.5. Public meeting slide show.

Northwest Management, Inc. • Serving the Western U.S. since 1984 • Main Office in Moscow, Idaho – Hayden, Idaho – Deer Park, Washington – Helena, Montana • Full Service Natural Resource Consultants *Providing a balanced approach to natural resource management*	FEMA Pre-Disaster Mitigation Plan Pondera County Plan (Draft 2006) **Natural & Manmade Hazards** • Flooding • **Wildland Fire** • Wind & Hail Storms • Tornado • Winter Storms • Transportation/Mobile Accident • Hazardous Materials Incident • Terrorism/Bio-Terrorism • Civil Disturbance/Riot/Labor Unrest • Enemy Attack • *Plus several others* **Each Hazard is one Chapter of the PDM** *Required by November 1, 2004 for all counties*

Table 2.5. Public meeting slide show.

What is Hazard Mitigation Planning?

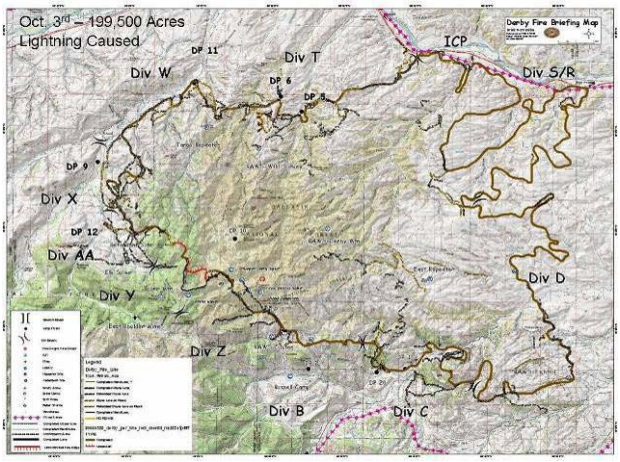
- Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. The primary purpose of mitigation planning is to systematically identify policies, actions, and tools that can be used to implement those actions.

FEMA Requirements

- Adoption by Local Government Body
- Multi-Jurisdictional Planning
- Identification of Hazards & Risk Assessment
  - Profiling Hazard Events
  - Mapping Juxtaposition of Hazards, Structures, Infrastructure
  - Potential Dollar Losses to Vulnerable Structures (B/C Analysis)
- Documented Planning Process
- Assessing Vulnerability
- Mitigation Goals
- Analysis of Mitigation Measures
- Monitoring, Evaluating & Updating the Plan (5 year cycles)
- Implementation Through Existing Programs
- Public Involvement

Wildland Fire Mitigation: National Policy

- **National Fire Plan (2000)**
  - Preparedness
  - Rehabilitation & Restoration
  - Hazardous Fuel Reduction
  - Community Protection
  - Accountability
- **Healthy Forests Restoration Act**
  - The HFRA gives communities the opportunity to define their own Wildland Urban Interface (WUI) boundary rather than using the default definition of 1 ½ miles from the community center.
  - The HFRA directs federal agencies to give special consideration to prioritized project areas and methods of treatment identified in a community plan.



Pondera County CWPP Committee

Formed by invitation from the County Disaster and Emergency Services Coordinator:

- County Commissioners
- County Departments
- City Mayors
- City Offices
- Local Fire Departments
- Blackfeet Tribe
- BLM
- DNRC
- USFS
- North Central RC&D
- Bureau of Indian Affairs
- Bureau of Reclamation
- Local Residents

Meetings are chaired by Northwest Management, Inc., representing the County Commissioner's Office

Public Involvement

- Public Mail Survey was sent to 200 households in Liberty County
- Planning Committee Meetings
- Press Releases & Advertisements
- Public Meeting in Chester
- Public Review of the DRAFT Plan will be facilitated once all sections have been completed and reviewed by the committee

Table 2.5. Public meeting slide show.

Hazard Mitigation Approach

- Hazard Profile
- Risk Assessment
- Vulnerability Appraisal
- Mitigation Strategy Development
- Prioritization and Planning
- Implement the Plan!

Wildland-Urban Interface

- **Interface Condition** – a situation where structures abut wildland fuels. There is a clear line of demarcation between the structures and the wildland fuels along roads or back fences. The development density for an interface condition is usually 3+ structures per acre;
- **Intermix Condition** – a situation where structures are scattered throughout a wildland area. There is no clear line of demarcation, the wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres;
- **Occluded Condition** – a situation, normally within a city, where structures abut an island of wildland fuels (park or open space). There is a clear line of demarcation between the structures and the wildland fuels along roads and fences. The development density for an occluded condition is usually similar to that found in the interface condition and the occluded area is usually less than 1,000 acres in size; and
- **Rural Condition** – a situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters.

Defining Pondera County's Wildland-Urban Interface

- Based only on population density = unbiased approach
- Unique to each area & it changes over time
- Based on where structures are currently located
- Uses mathematical formulae and geospatial relationships to visually represent where the WUI exists
- *When you see it, you'll understand what we mean*

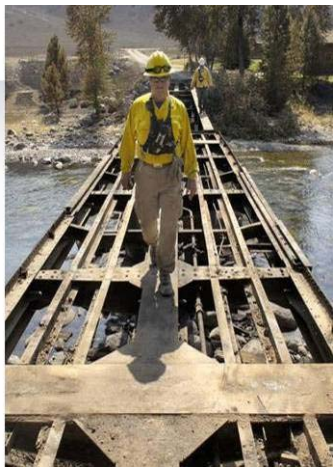
Preparedness

- City Fire Protection
- Rural Fire Protection
- Wildland Fire Protection
- EMS
- Local Utility Companies
- Burlington Northern Railroad

Table 2.5. Public meeting slide show.

How prepared are you (really)?

- How many escape routes do you have?
- Firefighter Access?



How prepared are you (really)?

- Construction Materials?
- Landscaping Techniques?
- Power lines?

Recommendations

- WUI Safety & Policy
- People & Structures
- Infrastructure
- Resources & Capabilities
- Regional Land Management Recommendations

Are we accomplishing these goals?

Types of Projects

- Defensible Space
  - Thinning, pruning, mowing, construction materials, types of landscaping, wood piles, propane tanks, awareness, etc.
- Roadside Fuels Treatments
- Access Issues
  - Bridges, turnouts, road width, turnarounds, overhangs, etc.
- Emergency Response Needs
  - Training, equipment, recruitment, PPEs, etc.
- Communication
- Policy Issues
  - Building codes, road restrictions, public education, burn permits, etc.
- Regional Land Management Recommendations
  - BLM, BOR, DNRC

Your Input

- Maps on the Walls – Mark them up!
- Talk to one of the planning committee members.
- Let us know your ideas and concerns.
- Make this YOUR Plan!

- Thank you for attending and participating! Please visit with us.

2.3.4 Documented Review Process

Reviews of sections of this document were conducted by the committee during the planning process as maps, summaries, and written assessments were completed. These individuals included fire mitigation specialists, firefighters, planners, elected officials, and others involved in the coordination process. Preliminary findings were discussed at the public meetings, where comments were collected and facilitated.

The results of these formal and informal reviews were integrated into a DRAFT Community Wildfire Protection Plan. This plan was given to members of the planning committee on November 27th, 2006. Public review of the revised DRAFT document was made from February 26th until March 30th. All comments were integrated into the final version of the mitigation plan.

The final plans were prepared on April 5th, 2007. Adoption of the Community Wildfire Protection Plan was completed by the listed municipalities on the dates indicated in section 6.4 (Signature Pages) as being formally adopted on those dates by the municipalities. Other agencies and organizations indicated their cooperation and collaboration in the planning process by signing the final version of the Plan as participants.

2.3.5 Continued Public Involvement

Pondera County is dedicated to involving the public directly in review and updates of the Community Wildfire Protection Plan. The Pondera County Commissioners, through the Community Wildfire Protection Plan Committee are responsible for the annual review and update of the plan as recommended in Chapter 5 of this document.

The public will have the opportunity to provide feedback about the Plan annually on the anniversary of the adoption of this plan, at a meeting of the County Commissioners. Copies of the Plan will be catalogued and kept at all of the appropriate agencies in the county. The existence and location of these copies will be publicized. The Plan also includes the address and phone number of the County Commissioners Office, responsible for keeping track of public comments on the Plan.

A public meeting will be held as part of each annual evaluation or when deemed necessary by the Community Wildfire Protection Plan Committee. The meetings will provide the public a forum for which they can express its concerns, opinions, or ideas about the plan. The County Commissioners will be responsible for using county resources to publicize the annual public meetings and maintain public involvement.

Chapter 3: County Characteristics & Risk Assessment

3 Background and Area Description

3.1 Location and Land Forms

Pondera County is located along the front range of the Rocky Mountains in north central Montana with Glacier County to the north, Toole County to the northeast, Liberty and Chouteau Counties to the east, Teton and Cascade Counties to the south, and Flathead County to the west. The county's population centers are located on the primarily flat rangelands in the central and eastern regions while the western edge is dominated by the rugged mountains of the Lewis and Clark National Forest. The northwest corner of Pondera County is part of the Blackfeet Indian Reservation, which extends northward into neighboring Glacier County.

The County covers approximately 1,652 square miles, of which 15.16 square miles are water area. The topography varies from flat rangelands to the Continental Divide (5,236 ft) in the Lewis and Clark National Forest bordering Glacier National Park on the west edge of the County. Conrad, the county seat, sits at about 3,535 feet above sea level (PDM Plan 2006).

3.2 Description of Pondera County

3.2.1 Demographics

Pondera County is a rural agricultural county with a population of 6,424 according to the 2000 Census. There are two incorporated cities within the county; Conrad has a population of 2,753 and Valier has a population of 498. There are also a number of small, unincorporated communities, including the town of Heart Butte (a census designated place on the Blackfeet Reservation), Brady, and Dupuyer. The population of Pondera County has been holding fairly steady since about 1920, with occasional minor changes. Between 1990 and 2000, the population shrank by about one percent. Pondera County is also home to several Hutterite Colonies including the Birch Creek Colony, Kingsbury Colony, Midway Colony, Miami Colony, and Pondera Colony (PDM Plan 2006).

3.2.2 Economy

Agriculture, small grains and cattle, is the largest income-producing segment of the Pondera County economy. Local government and the Pondera Medical Center are the largest non-agricultural employers. Information obtained from the 2000 Census shows the median household income during 1999 at $30,464 and the per capita income at $14,276. The percentage of those living below the poverty level during this time was 18.8% for Pondera County as opposed to 14.65% for the state. According to the Montana Department of Labor & Industry Research & Analysis Bureau, annual average unemployment for the County was 4.5% during 2002 (PDM Plan 2006).

3.2.3 Land Ownership

Federal land comprises 270,687 acres broken down as: U.S. Forest Service – 106,639 acres, Bureau of Land Management – 1,405 acres, and Tribal or Bureau of Indian Affairs – 162,643 acres. State lands comprise 56,730 acres and Burlington Northern Santa Fe owns 606 acres. The western portion of the County contains part of the Blackfeet Indian Reservation (PDM Plan 2006).

3.2.4 Climate

Pondera County is located within the region generally classified as dry continental, or steppe climate, with four well-defined seasons. This area of north central Montana is located in an extremely active weather zone. During the summer, typically June through August, there are numerous severe thunderstorms that produce large hail, damaging winds, and tornadoes. In November through March, this area is susceptible to extreme winter weather and prolonged severe wind events.

Average high temperatures in January are 9 degrees to 34 degrees Fahrenheit with average lows around 6 to 9 degrees. Extreme temperatures in January range from highs at 54 to 65 degrees Fahrenheit to lows at -2 to -24 degrees. Average high temperatures in July range from 95 to 103 degrees Fahrenheit with average lows in the 52 to 72 degree range. Averages are fairly uniform across the county.

Annual average precipitation is 14 - 16 inches in Pondera County. Because of the Rocky Mountains, the western portion of the county receives greater amounts of precipitation than the rest of the county. Approximately 70% of the precipitation in Pondera County occurs from May through September. Precipitation can vary significantly from year to year, and location to location within a given year. November through March is, on average, quite dry with the mean monthly precipitation of 0.50 inches or less. Average annual precipitation does not vary significantly across the county. The most intense precipitation often occurs with localized downpours associated with thunderstorms in June through August. Flash flooding has resulted from these downpours with over 3 inches of precipitation reported in a few events.

Severe thunderstorms are common from June into early September. The greatest hazards typically associated with these thunderstorms are very high winds and large hail. Damage to structures and crops occur regularly from these storms. Funnel clouds have been reported, but are relatively rare.

Average winter snowfall ranges from 60 to 200 inches, with the highest averages over the higher elevations in the northwestern part of the county. The heaviest snowstorms often occur from late March through May or mid-October to mid-November. These storms can produce more than 12 inches of snow and are often made more severe when temperatures are warmer and the snow is heavier and moister, making travel and snow removal very difficult. These storms are often accompanied by high winds, resulting in blizzard conditions. In spring, these storms can coincide with the calving season resulting in livestock loss. Mid-winter snowstorms, in general, produce less than 6 inches of snow, but events producing 10 inches or more have occurred. Despite the generally lighter and drier snow often seen in mid-winter months, high winds can result in blizzard conditions. Even without falling snow, in cold conditions high winds can pick up loose snow resulting in local ground blizzards.

An important element of the climate in Pondera County is the wind. Pondera County lies within the Chinook zone, which is associated with 160 mph wind speeds. Chinook winds, known elsewhere as Santa Anas or Sirroccos, during the winter and early spring can lead to significant snow melt and flooding of small streams and rivers. Average wind speeds range from 10 to 15 mph depending on the exposure of the location. The average and peak sustained winds tend to be stronger over higher, more exposed terrain and areas below steep canyons. The high wind gusts often occur during thunderstorms in the summer with gusts over 60 mph occurring every year. The highest sustained winds tend to occur in the spring and fall when long-lasting Chinook events are most likely to occur (PDM Plan 2006).

3.2.5 Cultural Resources

The United States has a unique legal relationship with Indian tribal governments defined in history, the U.S. Constitution, treaties, statutes, Executive Orders, and court decisions. Since the formation of the union, the United States has recognized Indian tribes as domestic dependent nations under its protection. The Federal Government has enacted numerous regulations that establish and define a trust relationship with Indian tribes.

The relationship between Federal agencies and sovereign tribes is defined by several laws and regulations addressing the requirement of Federal agencies to notify or consult with Native American groups or otherwise consider their interests when planning and implementing Federal undertakings, among these are:

- **EO 13175, November 6, 2000**, Consultation and Coordination with Indian Tribal Governments.
- **Presidential Memorandum, April, 1994**. Government-Government Relations with Tribal Governments (Supplements EO 13175). Agencies must consult with federally recognized tribes in the development of Federal Policies that have tribal implications.
- **EO 13007, Sacred sites, May 24, 1996**. Requires that in managing Federal lands, agencies must accommodate access and ceremonial use of sacred sites and must avoid adversely affecting the physical integrity of these sites.
- **EO 12875, Enhancing Intergovernmental Partnerships, October 26, 1993**. Mainly concerned with unfunded mandates caused by agency regulations. Also states the intention of establishing "regular and meaningful consultation and collaboration with state, local and tribal governments on matters that significantly or uniquely affect their communities."
- **Native American Graves Protection and Repatriation Act (NAGPRA) of 1989**. Specifies that an agency must take reasonable steps to determine whether a planned activity may result in the excavation of human remains, funerary objects, sacred objects and items of cultural patrimony from Federal lands. NAGPRA also has specified requirements for notifying and consulting tribes.
- **Archaeological Resources Protection Act (ARPA), 1979**. Requires that Federal permits be obtained before cultural resource investigations begin on Federal land. It also requires that investigators consult with the appropriate Native American tribe prior to initiating archaeological studies on sites of Native American origin.
- **American Indian Religious Freedom Act (AIRFA), 1978**. Sets the policy of the US to protect and preserve for Native Americans their inherent rights of freedom to believe, express, and exercise the traditional religions of the American Indian . . . including, but not limited to access to sacred sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites.
- **National Environmental Policy Act (NEPA), 1969**. Lead agency shall invite participation of affected Federal, State, and local agencies and any affected Indian Tribe(s).
- **National Historic Preservation Act (NHPA), 1966**. Requires agencies to consult with Native American tribes if a proposed Federal action may affect properties to which they attach religious and cultural significance. (Bulletin 38 of the act, identification of TCPs, this can only be done by tribes.)

- Treaties (supreme law of the land) in which tribes were reserved certain rights for hunting, fishing and gathering and other stipulations of the treaty.
- Unsettled aboriginal title to the land, un-extinguished rights of tribes.

3.2.5.1 Blackfeet Indian Reservation

The Blackfeet Indian Reservation was established by the Treaty of 1855. The reservation is part of what was once a much larger land base for the Tribe extending southward along the eastern slopes of the Rocky Mountains to the Yellowstone River and northward to the North Saskatchewan River in Canada.

The present reservation encompasses approximately 1.5 million acres (2,400.56 square miles) in northwestern Montana and is situated in Glacier and Pondera counties. The reservation boundaries are: Canada to the north, Lewis and Clark National Forest to the south, Glacier National Park to the west, and Toole County to the east. The major reservation communities are: Browning, Heart Butte, Starr School, East Glacier, Blackfoot, Seville, St. Mary, and Babb.

The Blackfeet Tribe has its headquarters in Browning, Montana and is governed by the elected Tribal Business Council consisting of nine members. The chairman of the Blackfeet Tribal Business Council serves as the chief executive officer. Tribal elections are held every two years, with a recent incorporation of staggered four-year terms.

The Blackfeet Nation, in its relationship with the federal government as a "domestic sovereign" Indian nation, is recognized as a nation within a nation through treaties, agreements, laws and executive orders.

The Blackfeet Tribe manages a wide variety of agencies and program for its members and residents and serves as the fiscal agent entrusted with managing grants, royalty income, contracts, and other financial obligations.

3.2.5.2 National Register of Historic Places

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their proposals on historic properties, and to provide state historic preservation officers, tribal historic preservation officers, and, as necessary, the Advisory Council on Historic Preservation a reasonable opportunity to review and comment on these actions.

Cultural resource impacts were qualitatively assessed through a presence/absence determination of significant cultural resources and mitigation measures to be employed during potential mitigation activities such as thinning, prescribed fire, road construction, flood abatement, and other activities.

Typical archeological sites include settlements, lithic scatters, village sites, rock art, and hunting blinds. The Blackfeet had a network of trails throughout the area which included various trade routes, as well as gathering and hunting routes. Some of the same trails were later used by homesteaders and trappers. Traditional Cultural Properties (TCPs) are cultural resources defined as a significant place or setting, and does not necessarily have any associated material remains. For example, a TCP can be a mountain, river, or natural feature (i.e., rock formation, meadow, etc.). Some of these are present in Pondera County. The integrity of some cultural resources has been impacted in the past by logging activities, road building, mining, and grazing.

The National Park Service maintains the National Register of Historical Places as a repository of information on significant cultural locale. These may be buildings, roads or trails, places where

historical events took place, or other noteworthy sites. The NPS has recorded sites in its database. These sites are summarized in Table 3.1.

Table 3.1. National Register of Historic Places in Pondera County, Idaho.

Item Number	Resource Name	Address	City	Listed	Architect, Builder, or Engineer
1	Conrad City Hall	15 4th Ave SW	Conrad	1980	
2	Froggie's Stopping Place on the Whoop Up Trail		Conrad	1993	
3	Two Medicine Fight Site	25 mi SE of Browning	Browning	1970	
4	Valier Public School	820 3rd St	Valier	1985	Shanley, George H.

3.2.6 Infrastructure

Pondera County has both significant infrastructure and unique ecosystems within its boundaries. These resources will be considered in the protection of infrastructural components for Pondera County and to the larger extent of this region, and the rest of Montana.

3.2.6.1 Transportation

Three highways traverse Pondera County. US Highway 89 runs north-south on the western side and I-15 runs north-south through the central part of the County. State Highway 44 runs east-west connecting US 89 and I-15 and passing through Valier.

Burlington Northern Santa Fe is the only railroad in the County. It runs north-south through Conrad with a spur running west to Valier. There is no passenger service.

There are two civilian airports in Pondera County. The airport at the west edge of Conrad has a blacktop strip 4,600 feet long and suitable for light and twin-engine aircraft. A second airport is located at the southern edge of Valier. It has a turf strip 2,280 feet long and is suitable for single engine aircraft. There is also numerous private sod strips located throughout the County. There is currently no commercial airline service available within Pondera County (PDM Plan 2006).

3.2.6.2 Water Supply

Lake Frances, located at the western edge of Valier, has two dams; the East Dam and the North Dam. Swift Dam, west of Dupuyer, near the Lewis & Clark Forest, impounds Birch Creek to create Swift Reservoir. Swift Dam is part of the Rocky Mountain Watershed and provides water to the Pondera Canal irrigators. Flood control and recreation are also derived from the dams. Lake Frances is the sole source of water for the City of Conrad.

Tiber Dam and Lake Elwell in eastern Pondera County, were part of an extensive project to mitigate flooding, generate electricity, irrigate the northern plains, and ensure ample water supply to float commercial river traffic below Sioux City, Iowa. President Harry Truman officially initiated the Tiber Dam project in 1952. Tiber Dam was completed in 1956, and since then has served chiefly as a means of flood control on the lower Marias; it bore the brunt of major floods in 1964 and 1975. Also, the reservoir regularly provides additional water to facilitate navigation on the lower Missouri. Some small individual irrigation diversions are functioning, but the original irrigation plan has not yet materialized, and the uplands are still drylands. Five private irrigators and the Tiber Irrigation Co., which consists of 17 individuals, are pumping water from Lake

Elwell under long-term water service contracts. The maximum amount of water diverted per year is about 6,000 acre-feet. Municipal and domestic water from Lake Elwell is being contracted for by the city of Chester, the Tiber County Water District, and Devon Water Inc. Additionally, local area fire departments have access to pump houses and irrigation diversions on Lake Elwell.

3.2.6.3 Power Lines

High Tension Power Lines have been mapped and are presented in Appendix I. Protection of these lines from loss during a wildfire is paramount in as much as the electrical power they provide serves not only the communities of Pondera County but of surrounding counties. The protection of these lines allows for community sustainability, support of the economic viability of Pondera County, and the protection of people who rely on that power. Fuels mitigation under power lines has received considerable attention in forested ecosystems as timber is thinned and heavy accumulations of brush are managed. This practice should be mandated into the future. However, the importance of management of rangeland ecosystems under high tension power lines should not be overlooked. Brush intermixed with grasses and other species, during extreme fire weather events, coupled with steep slopes can produce considerable heat and particulate matter. When this occurs under power lines, the result can be arcing between lines and even failure of the electrical media itself. Fuel mitigation treatments in high risk areas, especially where multiple lines are co-located, will be recommended for treatments.

3.2.7 Vegetation

Vegetation in Pondera County is a mix of grasslands, rangelands, and forested ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the forest vegetation of the area. The full extent of the county was evaluated for cover type as determined from Landsat 7 ETM+ imagery in tabular format, Table 3.2.

The most represented vegetated cover types are Upland Grasslands at 47% and Agricultural at 32% of the County's total area. The next most common vegetation cover type represented is Mixed Riparian at 4% of the total area.

Table 3.2. Landcover Types in Pondera County.

Category	Acres	Percent
Urban	1,644	0%
Agricultural	331,391	32%
Upland Grasslands	494,659	47%
Moist Shrubland	25,702	2%
Dry Shrubland	172	0%
Moist Shrub/Grassland	373	0%
Dry Shrub/Grassland	613	0%
Tree/Grassland	2,771	0%
Mixed Deciduous-Aspen	16,934	2%
Mixed Deciduous	10,176	1%
Moist Conifer Forest	34,615	3%
Conifer Forest	30,199	3%
Mixed Moist Forest	12,966	1%
Mixed Deciduous-Conif	409	0%
Standing Burnt or Dea	80	0%

Table 3.2. Landcover Types in Pondera County.		
Water	10,483	1%
Mixed Riparian	37,743	4%
Barren Land	3,221	0%
Exposed Rock	30,814	3%
Barren Alpine Tundra	166	0%
Badlands	553	0%
Shoreline or Gravel B	69	0%
Alpine Areas	1,096	0%
Snow-Ice	462	0%
Cloud	201	0%
Cloud Shadow	374	0%
Total	**1,047,886**	

Vegetative communities within the county follow the strong moisture and temperature gradient related to the major drainages. Scarce precipitation and soil conditions result in a relatively arid environment. As moisture availability increases, so does the abundance of shrub and forest vegetation.

3.3 Ecosystems

Pondera County is a diverse ecosystem with a complex array of vegetation, wildlife, and fisheries that have developed with, and adapted to fire as a natural disturbance process. A century of wildland fire suppression coupled with past land-use practices (primarily livestock grazing and farming) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. As a result, rangelands and forestlands in Pondera County have become more susceptible to large-scale, high intensity fires posing a threat to life, property, and natural resources including wildlife and special status plant populations and habitats. High-intensity, stand-replacing fires have the potential to seriously damage soils and native vegetation. In addition, an increase in the number of large high intensity fires throughout the nation's forest and rangelands, has resulted in significant safety risks to firefighters and higher costs for fire suppression (House of Representatives, Committee on Agriculture, Washington, DC, 1997).

3.4 Soils

Our soil resource is an extremely important component for maintaining a healthy ecosystem and economy. Fire can play an intricate role in this process, if it occurs under normal conditions of light fuels associated with low intensity underburns. However, the buildup of fuels and consequent high severity fires can cause soils to become water repellent (hydrophobic), and thus greatly increases the potential for overland flow during intense rains. Soil in degraded conditions does not function normally, and will not be able to sustain water quality, water yield, or plant communities that have normal structure, composition, and function. Fire is also strongly correlated with the carbon-nutrient cycles and the hydrologic cycle. Fire frequency, extent, and severity are controlled to a large degree by the availability of carbon, as well as the moisture regime (Quigley & Arbelbide 1997).

Soils were evaluated for their propensity to become hydrophobic during and after a fire as evidenced by the presence of clay and clay derivatives (e.g., clay loam, cobbly clay) in the upper soil layers. In addition, their permeability and tendency to allow runoff to infiltrate the soil

rapidly was evaluated. In general, with notable exceptions, the majority of the area within Pondera County has highly variable clay content in the surface horizons. On average these soils are well drained with moderate permeability. Forested areas have somewhat more developed soils. These areas are characterized by a thin O horizon made up of decomposing forest litter.

Low to moderate intensity fires would be not be expected to damage soil characteristics in the region, especially if the hotter fires in this range were limited to small extents associated with jackpots of cured fuels. Hot fires providing intense heat to the C horizon substrate depth have the potential to create hydrophobic characteristics in that layer. This can result in increased overland flow during heavy rains, following wildfire events, potentially leading to mass wasting. Rocky and gravelly characteristics in the A horizon layer would be expected to be displaced, while the silty and loamy fines in these soils may experience an erosion and displacement potential. These soils will experience the greatest potential impacts resulting from hot fires that burn for prolonged periods (especially on steep slopes).

3.4.1 Fire Mitigation Practices to Maintain Soil Processes

Firelines constructed by hand or with the use of machinery will have varying impacts, depending upon construction techniques. If only the surface litter is removed in the fireline construction, minor increases to soil erosion may occur. If trenches are dug which channelize runoff down steep slopes, heavy rilling or gullying could occur depending upon rock content of surface layers exposed. Jackpot burning and, to a greater extent, large scale pile burning would result in greater soil heating, but with localized impacts. Loss of soil carbon, nitrogen, sulphur, phosphorus, potassium, and soil organisms would be high in the soil surface layer. Soil physical structure could be altered thereby creating hydrophobic soils, especially where clay content is moderate or high. Loosely stacked hand piles resulting from typical defensible space projects in Pondera County would not be expected to have lasting affects on soil properties.

Indirect effects of prescribed burning to slope stability are highly variable in the soil types found in Pondera County. Vegetation structure, including root strength after over-burning, is maintained from three to fifteen years following low to moderate intensity burns and therefore soil saturation potential is not greatly altered. Re-vegetation of burned areas within this time frame will be a critical component to maintaining soil resources and pre-empting noxious weeds and invasive species from occupying the site. Locale experiencing high intensity burns will need to be evaluated immediately for mechanical erosion control followed by re-vegetation efforts. Holding soils in place will be a difficult challenge in many locations, especially on moderate to steep slopes.

Where heavy grazing has occurred in the past, there is also a possibility that soil productivity has been reduced. This is especially true in riparian areas where animal concentrations have historically been the greatest. These areas generally have easily compacted soils, and are where cattle tend to linger if not managed well. Grazing across Pondera County was observed to be maintained in a sustainable manner without the overgrazing found in other areas of the region. Mining also has significant effects on soil quality through soil compaction and mass displacement.

Severe fires in the past have consumed surface organics and volatilized nitrogen into the air. On some sites, however, these severe burns are a natural process, and therefore the inherent soil productivity may not be reduced. On other sites, however, where low intensity underburns typically occurred, high intensity wildland fires have consumed amounts of soil organics in excess of the historic patterns. Furthermore, excessive soil heating in these intense fires likely resulted in creation of water repellent soils, and therefore increased overland flow and soil erosion. In these cases, it can be assumed that wildland fires have reduced long-term soil

productivity. Soil compaction damage typically is persistent in the area; several decades of rest from further compactive forces are needed until adequate soil recovery occurs. Loss of organics due to displacement and severe fire also requires decades to recuperate. This slow recovery from soil damage makes cumulative effects to soil productivity and soil hydrologic function a major concern.

To avoid potential impacts, wherever possible, firelines should be located outside of highly erosive areas, steep slopes, intermittent streams, and riparian and other sensitive areas. Additionally, the impacts of firelines can be minimized by removing only the above ground vegetation and leaving plant roots intact. Following prescribed fire or fire suppression activities, firelines should be rehabilitated.

3.5 Hydrology

The Montana Department of Natural Resources and Conservation Water Resources Division is charged with the development of the Montana State Ground Water Plan. Included in the Plan is the statewide water policy plan along with detailed subsections regarding the protection, education, and remediation of Montana's ground water resources. The Montana DNRC Water Resources Division has prepared Surface Water Supply Index Maps for all of the surface water systems in Montana. This agency also addresses statewide floodplain management, streamflow conditions, dams and canals, and water rights issues.

The geology and soils of this region lead to slow to moderate moisture infiltration. Soils that have a clay pan or clay layer near the surface inhibit downward water transmission; thus, have a high potential for overland flow. Clayey soils also have a high shrink swell potential. Disrupted vegetation patterns from agriculture (soil compaction), forestry, and wildland fire (especially hot fires that increase soil hydrophobic characteristics), can lead to increased surface runoff and debris flow to stream channels.

A correlation to mass wasting due to the removal of vegetation caused by high intensity wildland fire has been documented for the central Montana region. Burned vegetation can result in changes in soil moisture and loss of rooting strength that can result in slope instability, especially on slopes greater than 30%. The greatest watershed impacts from increased sediment will be in the lower gradient, depositional stream reaches.

3.5.1 Fire Mitigation Practices to Maintain Hydrologic Processes

The effects of wildland fire and prescribed burning on water quality are variable. The removal of the vegetative canopy will tend to reduce transpiration and increase water yield, especially during the growing season and immediately afterwards (MacDonald *et al.* 1991). Prescribed burning is used to maintain a healthy, dynamic ecosystem while meeting land management objectives. Prescribed burning objectives include reduction of natural fuels, assuring current and future habitat conditions for native plants and animals, improvement of forest and rangeland health, and enhancement, protection, and maintenance of old growth and riparian areas. The majority of the burned areas are expected to receive low intensity ground fires with some areas of moderate intensity. This may include occasional torching of single trees or larger clumps of trees and consumption of some patches of regeneration. Impacts to soil and large woody debris are expected to be minimal, given project targets. In rangeland ecosystems, prescribed fire will have variable impacts dependant on burn intensity and proximity to streams. Stream buffering (low intensity to no burn around streams) has been shown to preserve most if not all normal sediment filtering functions.

A large, stand-replacing fire could have negative effects on watershed conditions, thus affecting both fish and habitat in streams. Treatment with low to moderate intensity fire would result in a

mosaic pattern of burned and unburned areas of ground level vegetation species and ground level natural fuels. Some patches of shade-tolerant, fire intolerant species may also be consumed. Prescribed burning is not designed to consume all vegetation within project areas. Each treatment will leave a mosaic of burned and unburned areas. Once the target fuels and the risk of fire carrying from one tributary to another have been reduced, hand ignition may be considered on a site-specific basis.

The effects on sediment yield vary according to the intensity of fire; degree of soil disturbance; steepness of the slope and drainage network; the size of the area burned; and the extent to which the vegetation controls the movement and storage of sediment. Fire also increases surface erosion and sediment delivery rates by removing the litter layer and organic debris that traps sediment both on slopes and in the stream channel (MacDonald *et al.* 1991). The magnitude of these effects will depend on the geomorphic sensitivity of the landscape, which is largely a function of slope steepness and parent material (Swanson 1978).

Fire can greatly increase surface erosion by temporarily creating a hydrophobic soil layer. Soils within the project area are generally at moderate risk for hydrophobic conditions due to their fine-grained textures and clay content. In addition, the relatively low burn intensity of the prescribed fires will also help prevent the formation of hydrophobic soils.

The effects of wildland fire or prescribed fire are generally considered in terms of potential short-term, negative effects and long-term benefits of fuels reduction, which will result in a decreased risk of high intensity, stand-replacing fire. Potential short-term effects to streams and fish include increased risk of landslides, mass movement and debris torrents, increases in surface sediment erosion, possible reduction in streamside vegetation resulting in changes within management areas, and possible increases in water yield depending on the amount and severity of the vegetation burned. Long-term effects include increases in nutrient delivery, possible increases in woody debris in streams, and possible increases in stream temperature if shading is significantly reduced. The design criteria described above minimizes the risk that landslides, mass movement, significant increases in surface sediment yield, and significant changes in water yield will occur.

Reduction of vegetation will mostly be limited to creeping ground fires, which will reduce understory vegetation, but will not affect mature trees or result in significant mortality to the overstory. Spring burning often results in minimal riparian vegetation burned because streamside areas have higher humidity and live plant moisture. Fall burning will more likely result in understory vegetation removal, with a possibility of some tree and large shrub mortality, especially outside of riparian zones where live plant moisture is less.

Riparian buffer strips will be maintained, thereby preserving canopy cover for shading, sediment filtering, and streambank and floodplain stability (PACFISH guidelines). Areas not burned will provide significant protection from adverse water quality impacts associated with wildland fire and prescribed burning. Therefore, effects to fish and habitat in these streams from increased water yield are unlikely. The area has been roaded from past management activities. Therefore, increased road densities from road construction are not expected to be of a magnitude to increase sedimentation to affected drainages provided adequate planning for new road construction is implemented. Forest practices in the area will be conducted to meet the standards of the Montana Streamside Management Law. These rules are designed to use best management practices that are adapted to and take account of the specific factors influencing water quality, water quality objectives, on-site conditions, and other factors applicable to the site where a forest practice occurs.

3.6 Air Quality

The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides (USDA Forest Service 2000).

Smoke emissions from fires potentially affect an area and the airsheds that surround it. Climatic conditions affecting air quality in central Montana are governed by a combination of factors. Large-scale influences include latitude, altitude, prevailing hemispheric wind patterns, and mountain barriers. At a smaller scale, topography and vegetation cover also affect air movement patterns. Air quality in the area and surrounding airshed is generally good to excellent. However, locally adverse conditions can result from occasional wildland fires in the summer and fall, and prescribed fire and agricultural burning in the spring and fall. All major river drainages are subject to temperature inversions which trap smoke and affect dispersion, causing local air quality problems. Air quality is also affected by winter inversions trapping emissions form internal combustion engines and wood burning stoves.

Pondera County is in the Montana Airshed Unit 9: Idaho/Montana Airshed Group Operating Guide (Levinson 2002). An airshed is a geographical area which is characterized by similar topography and weather patterns (or in which atmospheric characteristics are similar, e.g., mixing height and transport winds). The USDA Forest Service, Bureau of Land Management, and the Montana Department of Natural Resources and Conservation are all members of the Idaho/Montana State Airshed Group, which is responsible for coordinating burning activities to minimize or prevent impacts from smoke emissions. Prescribed burning must be coordinated through the Missoula Monitoring Unit, which coordinates burn information, provides smoke forecasting, and establishes air quality restrictions for the Idaho/Montana Airshed Group. The Monitoring Unit issues daily decisions which may restrict burning when atmospheric conditions are not conducive to good smoke dispersion. Burning restrictions are issued for airsheds, impact zones, and specific projects. The monitoring unit is active March through November. Each Airshed Group member is also responsible for smoke management all year.

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority governing air resource management. The act established a process for designation of Class I and Class II areas for air quality management. Class I areas receive the highest level of protection and numerical thresholds for pollutants are most restrictive for this Class. There are no Class I areas that would be affected by wildland fires or prescribed burning in Pondera County. The prevailing winds in Pondera County come from the west and southwest; however, Glacier National Park to the northwest and the Great Bear Wilderness to the west are Class I areas that could be negatively impacted by smoke originating in Pondera County.

All of the communities within Pondera County could be affected by smoke or regional haze from burning activities in the region. Montana Department of Environmental Quality maintains Air Pollution Monitoring Sites throughout Montana. The Air Pollution Monitoring program monitors all of the six criteria pollutants. Measurements are taken to assess areas where there may be a problem, and to monitor areas that already have problems. The goal of this program is to control areas where problems exist and to try to keep other areas from becoming problem air pollution areas (Louks 2001).

The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, OAQPS (Organization for Air Quality Protection Standards) is responsible for setting standards, also known as national ambient air quality standards (NAAQS), for pollutants which are considered harmful to people and the environment. OAQPS is also responsible for ensuring these air quality standards are met, or attained (in cooperation

with state, Tribal, and local governments) through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources (Louks 2001).

3.6.1 Fire Mitigation Practices to Maintain Air Quality

Smoke consists of dispersed airborne solids and liquid particles, called particulates, which can remain suspended in the atmosphere for a few days to several months. Particulates can reduce visibility and contribute to respiratory problems. Very small particulates can travel great distances and add to regional haze problems. Regional haze can sometimes result from multiple burn days and/or multiple owners burning within an airshed over too short a period of time to allow for dispersion.

For prescribed fires, there are three principle strategies to manage smoke and reduce air quality effects. They include:

1. **Avoidance -** This strategy relies on monitoring meteorological conditions when scheduling prescribed fires to prevent smoke from drifting into sensitive receptors, or suspending burning until favorable weather (wind) conditions exist. Sensitive receptors can be human-related (e.g. campgrounds, schools, churches, and retirement homes) or wildlife-related (threatened and endangered species and their critical habitats);
2. **Dilution –** This strategy ensures proper smoke dispersion in smoke sensitive areas by controlling the rate of smoke emissions or scheduling prescribed fires when weather systems are unstable, not under conditions when a stable high-pressure area is forming with an associated subsidence inversion. An inversion would trap smoke near the ground; and
3. **Emission Reduction –** This strategy utilizes techniques to minimize the smoke output per unit area treated. Smoke emission is affected by the number of acres burned at one time, pre-burn fuel loadings, fuel consumption, and the emission factor. Reducing the number of acres burned at one time would reduce the amount of emissions generated by that burn. Reducing the fuel beforehand reduces the amount of fuel available. Prescribed burning when fuel moistures are high can reduce fuel consumption. Emission factors can be reduced by pile burning or by using certain firing techniques such as mass ignition.

If weather conditions changed unexpectedly during a prescribed burn, and there was a potential for violating air quality standards or for adverse smoke impacts on sensitive receptors (schools, churches, hospitals, retirement homes, campgrounds, wilderness areas, and species of threatened or endangered wildlife), the management organization may implement a contingency plan, including the option for immediate suppression. Considering 1) the proposed action would result in prescribed fire on a relatively small number of acres, 2) burning as part of this mitigation plan's implementation in the County will most likely occur over a 5-year or 10-year period at a minimum, and 3) the County will adhere to Montana/Idaho Airshed Group advisories and management strategies to minimize smoke emissions, prescribed fire activities would not violate national or state emission standards and would cause very minor and temporary air quality impacts. The greatest threat to air quality would be smoke impacts on sensitive receptors; however, the relative scarcity of sensitive receptors within the County minimizes this potential air quality impact.

In studies conducted through the Interior Columbia Basin Management Project, smoke emissions were simulated across the Basin to assess relative differences among historical, current, and future management scenarios. In assessing the whole Upper Columbia Basin, there was a 43 percent reduction in smoke emissions between the historical and current periods

(Quigley and Arbelbide 1997). The projected smoke emissions varied substantially with the vastly different management scenarios. The consumptive demand and passive management scenarios were projected to substantially increase smoke emissions above current levels. The active management scenarios were projected to result in a decrease of current levels.

Although prescribed fire smoke would occur more frequently than wildland fire smoke, since prescribed fires are scheduled during the year, the effects of wildland fire smoke on visibility are more acute. Prescribed fires produce less smoke than wildland fires for comparatively shorter periods, because they are conducted under weather conditions that provide for better smoke dispersion. In a study conducted by Holsapple and Snell (1996), wildland fire and prescribed fire scenarios for the Columbia Basin were modeled. In conclusion, the prescribed fire scenarios did not exceed the EPA particulate matter (PM 10) standard in a 24-hour period. Similar projections were observed for a PM 2.5 threshold. Conversely, all wildland fire scenarios exceeded air quality standards. Similar responses were reported by Huff *et al.* (1995) and Ottmar *et al.* (1996) when they compared the effects of wildland fire to prescribed fire on air quality. The impacts of wildland fire and management ignited prescribed fire on air quality vary because of the differences in distribution of acres burned, the amount of fuel consumed per acre (due to fuel moisture differences), and the weather conditions in which typical spring and fall prescribed burns occur. This analysis reveals wildland fire impacts on air quality may be significantly greater in magnitude than emissions from prescribed burns. This may be attributable, in part, to the fact that several states within the project area have smoke management plans requiring favorable weather conditions for smoke dispersion prior to igniting wildland fires (Quigley and Arbelbide 1997).

Chapter 4: Summaries of Risk and Preparedness

4 Overview

4.1 Wildland Fire Characteristics

An informed discussion of fire mitigation is not complete until basic concepts that govern fire behavior are understood. In the broadest sense, wildland fire behavior describes how fires burn, the manner in which fuels ignite, how flames develop and how fire spreads across the landscape. The three major physical components that determine fire behavior are the fuels supporting the fire, the topography in which the fire is burning, and the weather and atmospheric conditions prior to and during a fire event. At the landscape level, both topography and weather are beyond our control. We are powerless to control winds, temperature, relative humidity, atmospheric instability, slope, aspect, elevation, and landforms. It is beyond our control to alter these conditions, and thus impossible to alter fire behavior through their manipulation. When we attempt to alter how fires burn, we are left with manipulating the third component of the fire environment, the fuels which support the fire. By altering fuel loading and fuel continuity across the landscape, we have the best opportunity to determine how fires burn.

A brief description of each of the fire environment elements follows in order to illustrate their effect on fire behavior.

4.1.1 Weather

Weather conditions are ultimately responsible for determining fire behavior. Moisture, temperature, wind, and relative humidity determine the rates at which fuels dry and vegetation cures, and whether fuel conditions become dry enough to sustain an ignition. Once conditions are capable of sustaining a fire, atmospheric stability and wind speed and direction can have a significant affect on fire behavior. Winds fan fires with oxygen, increasing the rate at which fire spreads across the landscape. Weather is the most unpredictable component governing fire behavior, constantly changing in time and across the landscape.

4.1.2 Topography

Fires burning in similar fuel conditions burn dramatically different under different topographic conditions. Topography alters heat transfer and localized weather conditions, which in turn influence vegetative growth and resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. Generally speaking, north slopes tend to be cooler, wetter, more productive sites. This can lead to heavy fuel accumulations, with high fuel moistures, later curing of fuels, and lower rates of spread. The combination of light fuels and dry sites lead to fires that typically display the highest rates of spread. In contrast, south and west slopes tend to receive more direct sun, and thus have the highest temperatures, lowest soil and fuel moistures, and lightest fuels. These slopes also tend to be on the windward side of mountains. Thus these slopes tend to be “available to burn” a greater portion of the year.

Slope also plays a significant roll in fire spread, by allowing preheating of fuels upslope of the burning fire. As slope increases, rate of spread and flame lengths tend to increase. Therefore, we can expect the fastest rates of spread on steep, warm south and west slopes with fuels that are exposed to the wind.

4.1.3 Fuels

Fuel is any material that can ignite and burn. Fuels describe any organic material, dead or alive, found in the fire environment. Grasses, brush, branches, logs, logging slash, forest floor litter, conifer needles, and home sites (the structures) are all examples. The physical properties and characteristics of fuels govern how fires burn. Fuel loading, size and shape, moisture content and continuity and arrangement all have an affect on fire behavior. Generally speaking, the smaller and finer the fuels, the faster the potential rate of fire spread. Small fuels such as grass, needle litter and other fuels less than a quarter inch in diameter are most responsible for fire spread. In fact, "fine" fuels, with high surface to volume ratios, are considered the primary carriers of surface fire. This is apparent to anyone who has ever witnessed the speed at which grass fires burn. As fuel size increases, the rate of spread tends to decrease, as surface to volume ratio decreases. Fires in large fuels generally burn at a slower rate, but release much more energy, and burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control. Thus, it is much easier to control a fire burning in grass than to control a fire burning in timber.

When burning under a forest canopy, the increased intensities can lead to torching (single trees becoming completely involved) and potentially development of crown fire. Fuels are found in combinations of types, amounts, sizes, shapes, and arrangements. It is the unique combination of these factors, along with the topography and weather, which determine how fires will burn.

The study of fire behavior recognizes the dramatic and often-unexpected affect small changes in any single component has on how fires burn. It is impossible to speak in specific terms when predicting how a fire will burn under any given set of conditions. However, through countless observations and repeated research, some of the principles that govern fire behavior have been identified and are recognized.

4.1.3.1 Conservation Reserve Program Lands

The Conservation Reserve Program is administered by the USDA Farm Services Agency. The Conservation Reserve Program (CRP) is a voluntary program for agricultural landowners. Through CRP, farmers can receive annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible farmland. The Commodity Credit Corporation (CCC) makes annual rental payments based on the agriculture rental value of the land and it provides cost-share assistance for up to 50 percent of the participant's costs in establishing approved conservation practices. Participants enroll in CRP contracts for 10 to 15 years.

The Food Security Act of 1985, as amended, authorized CRP. The program is also governed by regulations published in 7 CFR, part 1410. The program is implemented by Farm Service Agency (FSA) on behalf of USDA's Commodity Credit Corporation with additional program support provided by the Natural Resources Conservation Service, the Cooperative State Research and Education Extension Service, state forestry agencies, and local Soil and Water Conservation Districts. Approximately 3.4 million acres of farm land in Montana have been enrolled in the CRP program through February 2005.

USDA Farm Service Agency's (FSA) Conservation Reserve Program (CRP) is a voluntary program available to agricultural producers to help them safeguard environmentally sensitive land. Producers enrolled in CRP plant long-term, resource-conserving covers to improve the quality of water, control soil erosion, and enhance wildlife habitat. In return, FSA provides participants with rental payments and cost-share assistance.

CRP protects millions of acres of American topsoil from erosion and is designed to safeguard the Nation's natural resources. By reducing water runoff and sedimentation, CRP protects groundwater and helps improve the condition of lakes, rivers, ponds, and streams. Acreage enrolled in the CRP is planted to resource-conserving vegetative covers, making the program a major contributor to increased wildlife populations in many parts of the country.

Although there are many benefits to the County stemming from CRP land enrollment, the impact on wildfire control is problematic. When these lands, often near communities and homes, build up heavy fuels consistent with natural grasses and shrubs, the fuel loading increases dramatically above that found on farmlands or that would have been found with a natural fire return interval. Fires in these fuels can move very rapidly when fanned by winds (common during the fire season).

During fiscal year 2005, Montana had over 3.4 million acres enrolled in the Crop Reserve Program with Pondera County contributing approximately 85,400 acres. The FSA allows periodic fuels mitigation treatments on CRP lands including the establishment of fuel breaks around buildings or along road corridors. Existing CRP contracts can be modified to include some types of fuels reduction and/or hazard mitigation treatments. These fuel treatments or projects are critical to the development of a successful wildfire mitigation program in Pondera County and are fully endorsed and encouraged by the Community Wildfire Protection Plan Committee.

4.2 Wildfire Hazard Profiles

4.2.1 Wildfire Ignition and Extent Profile

Fire was once an integral function of the majority of ecosystems in Montana. The seasonal cycling of fire across the landscape was as regular as the lightning storms plying across the canyons and mountains. Depending on the plant community composition, structural configuration, and buildup of plant biomass, fire resulted from ignitions with varying intensities and extent across the landscape. Shorter return intervals between fire events often resulted in less dramatic changes in plant composition (Johnson 1998). The fires burned from 1 to 47 years apart, with most at 5- to 20-year intervals (Barrett 1979). With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age (Johnson *et al.* 1994). Native plant communities in this region developed under the influence of fire, and adaptations to fire are evident at the species, community, and ecosystem levels. Fire history data (from fire scars and charcoal deposits) suggest fire has played an important role in shaping the vegetation in the region for thousands of years (Steele *et al.* 1986, Agee 1993).

Detailed records of fire ignition and extent have been compiled by the Bureau of Land Management, Montana Department of Natural Resources and Conservation, U.S. Forest Service, Bureau of Indian Affairs, and local fire districts. Using this data on past fire extents and fire ignition data, the occurrence of wildland fires in the region of Pondera County has been evaluated.

Many fires have burned in the region of Pondera County (Table 4.1). There were approximately 45 fire ignitions during this 15 year period, with the highest number of total ignitions peaking in 1992 and 1994. The most acres burned in Pondera County also occurred in 1992 and 1994.

Table 4.1. Summary of Wildfire Ignitions and Acres Burned by Cause from 1988 – 2004.

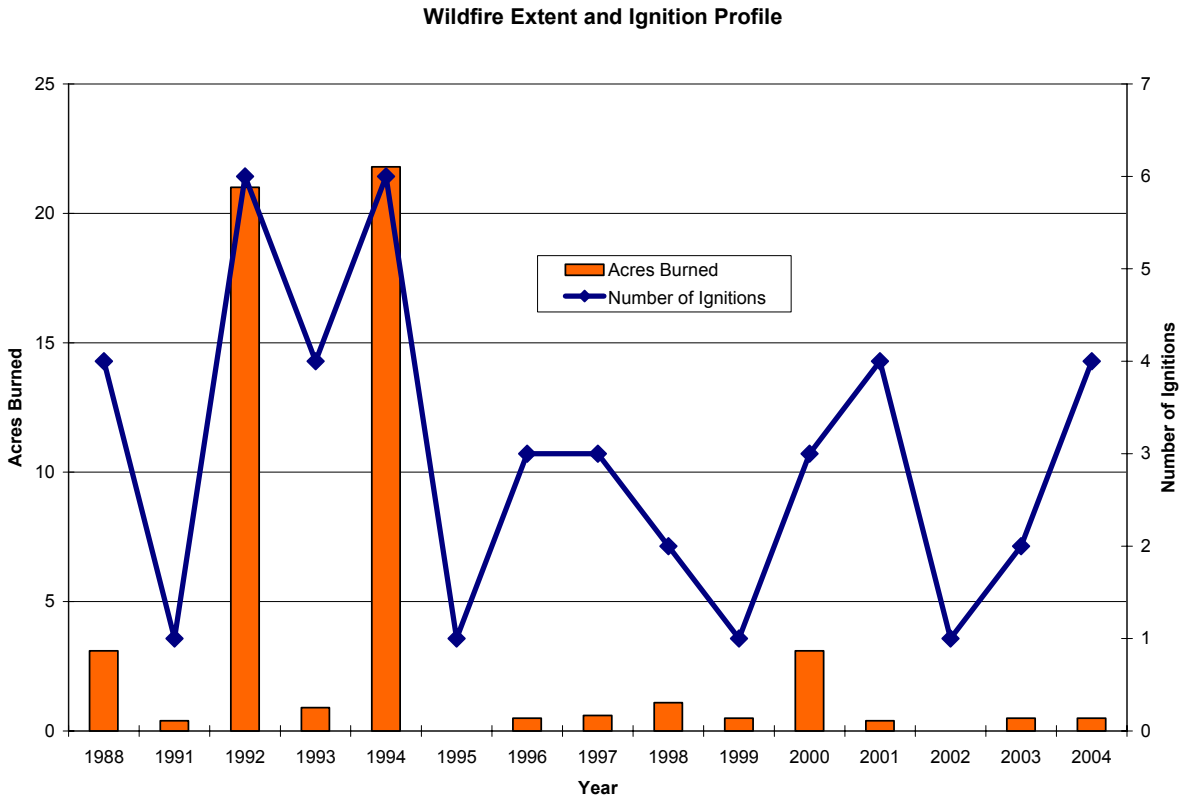
Cause	Acres Burned	Percent of Total	Number of Ignitions	Percent of Total

Table 4.1. Summary of Wildfire Ignitions and Acres Burned by Cause from 1988 – 2004.

Cause	Acres Burned	Percent of Total	Number of Ignitions	Percent of Total
Campfire	7	13%	8	18%
Children	3	5%	3	7%
Debris	2	4%	3	7%
Equipment	35	64%	6	13%
Lightning	1	2%	2	4%
Miscellaneous	3	5%	14	42%
Smoking	4	7%	2	4%
Unknown	0	0%	7	16%
Total	**55**		**45**	

Since 1988, it would appear that nearly all fires in Pondera County were human caused. There may be many factors contributing to this statistic, but the agrarian economy is likely mainly responsible. Human caused fires have also contributed to the most acres burned throughout Pondera County. The large number of equipment related (probably agricultural) wildfire ignitions has influenced this statistic greatly and it is important to note that the overwhelming majority of these fires have been contained at less than an acre.

Figure 4.1. Wildfire Extent and Ignition Profile for Pondera County.



Currently past fire information is recorded as hardcopies by the Pondera County Rural Fire District. Due to the extreme time investment in compiling this information, only the fire calls from 2006 are summarized for inclusion in Table 4.2.

Table 4.2. Summary of Fire Calls by Fire Department in 2006.

Department Name	Structural Responses	Wildfire Responses
Brady Fire Department	6	1
Conrad Fire Department	29	17
Dupuyer Fire Department	11	1
Valier Fire Department	12	4

4.2.2 National Fire Statistics

Across the west, wildfires have been increasing in extent and cost of control. The National Interagency Fire Center (2005) reported over 77,500 wildfires in 2004 which burned a total of 6.7 million acres and cost $890 million in containment (Table 4.3). Data summaries for 2000 through 2004 are provided and demonstrate the variability of the frequency and extent of wildfires nationally (Table 4.3). It is important to note that the 10 year moving average number of acres burned reported each year has been increasing constantly since 2000.

Table 4.3. National Fire Season Summaries.

Statistical Highlights	2000	2001	2002	2003	2004
Number of Fires	122,827	84,079	88,458	85,943	77,534
10-year Average ending with indicated year	106,393	106,400	103,112	101,575	100,466
Acres Burned	**8,422,237**	**3,570,911**	**6,937,584**	**4,918,088**	**6,790,692**
10-year Average ending with indicated year	3,786,411	4,083,347	4,215,089	4,663,081	4,923,848
Structures Burned	861	731	2,381	5,781	1,095
Estimated Cost of Fire Suppression (Federal agencies only)	$1.3 billion	$542 million	$ 1.6 billion	$1.3 billion	$890 million

The National Interagency Fire Center, located in Boise, Idaho, maintains records of fire costs, extent, and related data for the entire nation. Tables 4.4 and 4.5 summarize some of the relevant wildland fire data for the nation, and some trends that are likely to continue into the future unless targeted fire mitigation efforts are implemented and maintained.

These statistics (Table 4.4) are based on end-of-year reports compiled by all wildland fire agencies after each fire season, and are updated by March of each year. The agencies include: Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service, USDA Forest Service and all State Lands.

Table 4.4. Total Fires and Acres 1960 - 2004 Nationally.

Year	Fires	Acres	Year	Fires	Acres
2004	77,534	* 6,790,692	1981	249,370	4,814,206
2003	85,943	4,918,088	1980	234,892	5,260,825
2002	88,458	6,937,584	1979	163,196	2,986,826
2001	84,079	3,555,138	1978	218,842	3,910,913
2000	122,827	8,422,237	1977	173,998	3,152,644
1999	93,702	5,661,976	1976	241,699	5,109,926
1998	81,043	2,329,709	1975	134,872	1,791,327
1997	89,517	3,672,616	1974	145,868	2,879,095
1996	115,025	6,701,390	1973	117,957	1,915,273

Table 4.4. Total Fires and Acres 1960 - 2004 Nationally.

Year	Fires	Acres	Year	Fires	Acres
1995	130,019	2,315,730	1972	124,554	2,641,166
1994	114,049	4,724,014	1971	108,398	4,278,472
1993	97,031	2,310,420	1970	121,736	3,278,565
1992	103,830	2,457,665	1969	113,351	6,689,081
1991	116,953	2,237,714	1968	125,371	4,231,996
1990	122,763	5,452,874	1967	125,025	4,658,586
1989	121,714	3,261,732	1966	122,500	4,574,389
1988	154,573	7,398,889	1965	113,684	2,652,112
1987	143,877	4,152,575	1964	116,358	4,197,309
1986	139,980	3,308,133	1963	164,183	7,120,768
1985	133,840	4,434,748	1962	115,345	4,078,894
1984	118,636	2,266,134	1961	98,517	3,036,219
1983	161,649	5,080,553	1960	103,387	4,478,188
1982	174,755	2,382,036			

(National Interagency Fire Center 2004)

Table 4.5. Suppression Costs for Federal Agencies Nationally.

Year	Bureau of Land Management	Bureau of Indian Affairs	Fish and Wildlife Service	National Park Service	USDA Forest Service	Totals
2004	$ 147,165,000	$ 63,452,000	$ 7,979,000	$ 34,052,000	$ 637,585,000	**$890,233,000**
2003	$151,894,000	$ 96,633,000	$ 9,554,000	$ 44,557,000	$ 1,023,500,000	**$1,326,138,000**
2002	$ 204,666,000	$ 109,035,000	$ 15,245,000	$ 66,094,000	$ 1,266,274,000	**$1,661,314,000**
2001	$ 192,115,00	$ 63,200,000	$ 7,160,000	$ 48,092,000	$ 607,233,000	**$917,800,000**
2000	$180,567,000	$ 93,042,000	$ 9,417,000	$ 53,341,000	$ 1,026,000,000	**$1,362,367,000**
1999	$ 85,724,000	$ 42,183,000	$ 4,500,000	$ 30,061,000	$ 361,000,000	**$523,468,000**
1998	$ 63,177,000	$ 27,366,000	$ 3,800,000	$ 19,183,000	$ 215,000,000	**$328,526,000**
1997	$ 62,470,000	$ 30,916,000	$ 2,000	$ 6,844,000	$ 155,768,000	**$256,000,000**
1996	$ 96,854,000	$ 40,779,000	$ 2,600	$ 19,832,000	$ 521,700,000	**$679,167,600**
1995	$ 56,600,000	$ 36,219,000	$ 1,675,000	$ 21,256,000	$ 224,300,000	**$340,050,000**
1994	$ 98,417,000	$ 49,202,000	$ 3,281,000	$ 16,362,000	$ 678,000,000	**$845,262,000**

(National Interagency Fire Center 2005)

Although many very large fires, growing to over 250,000 acres have burned in Montana, fires have usually been controlled at much smaller extents. This is not to imply that wildfires are not a concern in this county, but to point to the aggressive and professional manner to which the wildland and rural fire districts cooperate in controlling these blazes.

4.2.2.1 Prescribed Burning of Federal Acres

Prescribed fire has been effectively used as a mitigation tool, primarily on Federal and State lands across the US, and especially in the Western US. Federal Agencies report prescribed fire usage, with summaries provided by the National Interagency Fire Center, located in Boise, Idaho. National data is provided in Tables 4.6 and 4.7.

Table 4.6. Federal Wildland Fire Agency Prescribed Fire Acres Treated.

Agency	1995 Acres	1996 Acres	1997 Acres	1998 Acres	1999 Acres	2000 Acres

Table 4.6. Federal Wildland Fire Agency Prescribed Fire Acres Treated.

Agency	1995 Acres	1996 Acres	1997 Acres	1998 Acres	1999 Acres	2000 Acres
USDA Forest Service	570,300	617,163	1,097,658	1,489,293	1,379,960	728,237
Bureau of Indian Affairs	21,000	16,000	37,000	48,287	83,875	3,353
Bureau of Land Management	56,000	50,000	72,500	200,223	308,000	125,600
National Park Service	62,000	52,000	70,000	86,126	135,441	19,072
U.S. Fish and Wildlife Service	209,000	180,000	324,000	285,758	300,508	201,052
Total	**918,300**	**915,163**	**1,601,158**	**1,889,564**	**2,240,105**	**1,077,314**

(National Interagency Fire Center 2005)

Table 4.7. Prescribed Fire Costs, Nationally.

Year	Bureau of Land Management	Bureau of Indian Affairs	Fish and Wildlife Service	National Park Service	USDA Forest Service	Totals
1995	$ 0	$ 840,000	$ 0	$ 3,200,000	$ 16,406,000	$ 20,446,000
1996	$ 1,200,000	$ 650,000	$ 0	$ 3,200,000	$ 24,500,000	$ 29,550,000
1997	$ 1,600,000	$ 800,000	$ 0	$ 4,600,000	$ 29,146,000	$ 36,146,000
1998	$ 6,700,000	$ 2,268,000	$ 4,825,000	$ 7,000,000	$ 50,000,000	$ 70,793,000
1999	$ 10,600,000	$ 6,300,000	$ 7,404,000	$ 9,800,000	$ 65,000,000	$ 99,104,000

4.2.2.2 Firefighter Accidents

The United States currently depends on approximately 1.2 million firefighters (municipal and wildland) to protect its citizens and property from losses caused by fire. Of these firefighters, approximately 210,000 are career/paid and approximately 1 million are volunteers. The National Fire Protection Association (NFPA) and the U.S. Fire Administration estimate that on average, 105 firefighters die in the line of duty each year (NIFC 2005).

Due to the growing number of homes in the wildland/urban interface, it is almost inevitable that wildland and structural firefighters will find themselves in dangerous role reversals for which they may not be adequately trained or equipped. For example, wildland firefighters may be called on to protect threatened homes, and structural firefighters may be called on to help battle the surrounding blazes in the wildlands.

In addition to the obvious difference of size, wildland fires and structure fires differ in that wildland fires require:

- more personnel, some of whom may have little or no fire fighting experience
- more resources spread out over a larger area.

Because of these factors, wildland fires present personal safety concerns to three areas:

- the firefighter
- the area immediately surrounding the firefighter
- the overall environment of the fire itself.

The most direct way to improve the safety of both structural and wildland firefighters is cross-training of all firefighters and improved equipment. While cross-training is being done in some regions throughout the country, it is still not standard practice everywhere. Until cross-training programs become universal, awareness may be the tool that saves lives.

Of the 1,046 firefighters who died while on duty from 1987 through 1996, 163 (15.6%) died while fighting wildland fires. The number of deaths was generally between 12 and 22 per year, with the exception of seven deaths in 1993 and 1996, and 33 deaths in 1994. Over the period, 23.6% of all fire ground deaths occurred at wildland fires (Firewise 2005).

This analysis includes members of municipal fire departments who responded to grass, brush and forest fires within their jurisdictions as well as career, seasonal and contract employees of state and federal wildland agencies who were involved in assigned firefighting activities at the time there were fatally injured (Firewise 2005). The federal wildland agencies include the U.S. Forest Service, the Bureau of Indian Affairs, the Bureau of Land Management, the Fish and Wildlife Service, the National Park Service and the military.

The 163 victims (1987-1996) ranged in age from 15 to 83, with a median age of 34. Fourteen of the victims were women. Approximately 70% of all wildland fire deaths (114) occurred during fire suppression activities. Another 49 deaths occurred when firefighters were responding to or returning from such fires.

4.2.2.2.1 Deaths on the Ground from Fire

The largest proportion of deaths during fire suppression activities resulted from being caught or trapped by fire progress. Twenty-five of these 38 firefighters died of smoke inhalation; the other 13 died as a result of burns. Fourteen of these 38 deaths occurred in a single incident in 1994.

Wildland fire deaths by nature of fatal injury, more commonly referred to as the medical cause of death, is important to understanding this issue. State and federal wildland officials believe that their rigorous fitness requirements lower the risk of heart attack death among firefighters under their jurisdiction. For this analysis, then, the fire ground deaths were broken down by type of department municipal (career or volunteer) or wildland agencies. A profile of the 114 fire ground victims shows that 50 were members of municipal fire departments (44 were volunteer firefighters and six were career firefighters). The other 64 firefighters were career, seasonal or contract employees of state and federal wildland agencies, or military personnel.

4.2.2.2.2 Municipal Firefighters

As shown in Table 4.8, heart attacks accounted for over half of the deaths of municipal firefighters during fire ground operations, while most of the deaths of state and federal employees were due to internal trauma, asphyxiation and burns.

Of the 17 municipal heart attack victims for whom medical documentation was available, nine had had prior heart attacks or bypass surgery, three had severe arteriosclerotic heart disease, three had hypertension and one was diabetic. The municipal volunteer firefighters who suffered fatal heart attacks ranged in age from 27 to 83, with a median age of 58. The one wildland agency firefighter who died of a heart attack was 38 years old and had severe arteriosclerotic heart disease.

The lower proportion of heart attacks among wildland agency firefighters may be a result of stricter fitness requirements, but it could also be a function of age. Older firefighters are more likely to suffer heart attacks and if the wildland agencies employ a significantly lower percentage of old firefighters, their experience would reflect this. Looking at all fire ground deaths, municipal vs. wildland agencies, the ages of wildland firefighters who died ranged from 18 to 64, with a median age of 32 years, while volunteer municipal firefighters ranged in age from 18 to 83, with a median age of 50. The six career municipal firefighters ranged in age from 20 to 49, with a median age of 29. Other factors besides age and fitness requirements that may impact the incidence of heart attack deaths at wildland fires include the equipment provided. In many of the

incidents handled by municipal firefighters, those involved in fighting the fire did so in full protective clothing designed for structural firefighting, while wildland firefighters wear clothing, helmets and boots more appropriate to outdoor work (Firewise 2005).

Table 4.8. Wildland firefighter deaths on the fire ground by nature of Fatal Injury 1987-1996.

Fatality Cause	Federal and State Wildland Agencies	Municipal		Total
		Volunteer	Career	
Heart attack	1	27	0	28
Internal trauma	24	3	1	28
Asphyxiation	23	2	0	25
Burns	9	4	3	16
Crushing	4	4	0	8
Electric shock	1	2	0	3
Heat stroke	0	1	2	3
Stroke	2	0	0	2
Bleeding	0	1	0	1
Total	64	44	6	114

As far as the other types of injuries suffered on the fire ground are concerned, increased use of fire shelters could result in a reduction in fatal burns and smoke inhalation deaths and safer handling of aircraft could reduce the number of deaths due to aircraft crashes during suppression activities.

4.2.2.2.3 Deaths While Responding to or Return from Alarms

Of the 163 wildland-related deaths that occurred between 1987 and 1996, 49 occurred when firefighters were responding to or returning from such fires. Thirty four of the 49 deaths were the result of vehicle crashes, 12 were heart attacks, one firefighter was crushed when a tree fell on the crew area of a moving truck, one firefighter was crushed between two pieces of apparatus while he attempted to start the rear-mounted pump in preparation for response to an incident and one firefighter drowned at a base camp after returning from the fire line.

The 34 deaths in crashes occurred in 25 separate incidents. Ten contractors and four federal employees were killed in six aircraft crashes. Eleven firefighters were killed in 10 crashes involving tankers, and five firefighters were killed when their personal vehicles crashed. The remaining four deaths resulted from crashes involving an engine, a brush unit, a supply vehicle and a military vehicle.

The 12 heart attack victims included eight municipal firefighters, three forestry employees and one contractor. Five of the 12 firefighters had had prior heart attacks or bypass surgery, one had severe arteriosclerotic heart disease and one was diabetic. No medical information was available for the other five heart attack victims.

4.2.2.2.4 Montana State Fatalities

Within Montana State, wildland fire injuries have been documented by the National Interagency Fire Center (2005) and are summarized in Table 4.9. From 1932-2003, there have been 38 fatalities during 16 incidents involving significant injuries. Burn over and entrapments are common themes in the listed fatalities. In order to reduce the risks to firefighters responding to wildland fire events, these issues must be addressed and eliminated.

Table 4.9. Wildfire accidents reported in Montana, 1910-2003.

Year	Place	Type of Accident	Organization	Fatalities
1931	Teton RD		Federal	5
1933	Basin	Hypothermia	Federal	1
1934	Glacier NP	Snag	Federal	1
1934	Lincoln NF	Snag	Federal	1
1937	Missoula	Burnover	Federal	1
1949	Helena NF	Burnover	Federal	13
1967	Kootenai NF	Burnover	Federal	2
1984	Humansville	Burnover	Unknown	2
1988	Flathead NF	Snag	Federal	1
1988	Not Reported	Engine Rollover	Federal	1
1988	Not Reported	Snag	Other	1
1988	Not Reported	Vehicle	Federal	1
1991	Missoula	Fire Training	Federal	1
1991	Not Reported	Aircraft	Federal	2
1994	Missoula	Air tanker	Contractor/Federal	2
1996	Colstrip	Burnover	Private	2
1999	Pompeys Pillar	Dozer Burnover	Contractor	0
2001	Livingston	Helicopter	Contractor	3
2001	Not Reported	Snag	Federal	1
2002	Dillon	Work Capacity Test	State	1
2003	Missoula	Heart Attack	State	1

(National Interagency Fire Center 2005)

4.3 Wildfire Hazard Assessment

Pondera County and adjacent counties were analyzed using a variety of techniques, managed on a GIS system (ArcGIS 9). Physical features of the region were represented by data layers including roads, streams, soils, elevation, and remotely sensed images from the Landsat 7 ETM+ satellite. Field visits were conducted by specialists from Northwest Management, Inc. and others. Discussions with area residents and fire control specialists augmented field visits and provided insights to forest and rangeland health issues and treatment options. This information was analyzed and combined to develop an assessment of wildfire risk in the region.

4.3.1 Fire Prone Landscapes

Schlosser *et al.* 2002, developed a methodology to assess the location of fire prone landscapes on forested and non-forested ecosystems in the western US. This analysis procedure has been completed on approximately 45 million acres across Montana, Wyoming, Idaho, Washington, and Nevada since 2002.

The goal of developing the Fire Prone Landscapes analysis is to make inferences about the relative risk factors across large geographical regions (multiple counties) for wildfire spread. This analysis uses the extent and occurrence of past fires as an indicator of characteristics for a specific area and their propensity to burn in the future. Concisely, if a certain combination of vegetation cover type, canopy closure, aspect, slope, stream and road density have burned with a high occurrence and frequency in the past, then it is reasonable to extrapolate that they will

have the same tendency in the future, unless mitigation activities are conducted to reduce this potential.

The analysis for determining those landscapes prone to wildfire utilized a variety of sources.

Digital Elevation: Digital elevation models (DEM) for the project used USGS 30 meter DEM data provided at quarter-quadrangle extents. These were merged together to create a continuous elevation model of the analysis area.

The merged DEM file was used to create two derivative data layers: aspect and slope. Both were created using the spatial analyst extension in ArcGIS 9. Aspect data values retained one decimal point accuracy representing the cardinal direction of direct solar radiation, represented in degrees. Slope was recorded in percent and also retained one decimal point accuracy.

Remotely Sensed Images: Landsat 7 Enhanced Thematic Mapper (ETM+) images were used to assess plant cover information and percent of canopy cover. The Landsat ETM+ instrument is an eight-band multi-spectral scanning radiometer capable of providing high-resolution image information of the Earth's surface. It detects spectrally-filtered radiation at visible, near-infrared, short-wave, and thermal infrared frequency bands from the sun-lit Earth. Nominal ground sample distances or "pixel" sizes are 15 meters in the panchromatic band; 30 meters in the 6 visible, near and short-wave infrared bands; and 60 meters in the thermal infrared band.

The satellite orbits the Earth at an altitude of approximately 705 kilometers with a sun-synchronous 98-degree inclination and a descending equatorial crossing time of 10 a.m. daily.

Image spectrometry has great application for monitoring vegetation and biophysical characteristics. Vegetation reflectance often contains information on the vegetation chlorophyll absorption bands in the visible region and the near infrared region. Plant water absorption is easily identified in the middle infrared bands. In addition, exposed soil, rock, and non-vegetative surfaces are easily separated from vegetation through standard hyper-spectral analysis procedures.

Landsat 7 ETM images were obtained to conduct hyper-spectral analysis for this project. The image was obtained in 1998. Hyper-spectral analysis procedures followed the conventions used by the Montana Vegetation and Land Cover Classification System, modified from Redmond (1997) and Homer (1998).

Riparian Zones: Riparian zones were derived from stream layers.

Past Fires: Past fire extents represent those locations on the landscape that have previously burned during a wildfire. Past fire extent maps were obtained from a variety of sources for the central Montana area including the Bureau of Land Management, U.S. Forest Service, Bureau of Indian Affairs, and the Montana Department of Natural Resources and Conservation. Pondera County fire districts provided additional fire history and occurrence information that was digitized into a GIS system so that a full wildfire database was available to characterize wildfire occurrence in Pondera County. This data was used in the formation of the Fire Prone Landscapes assessment.

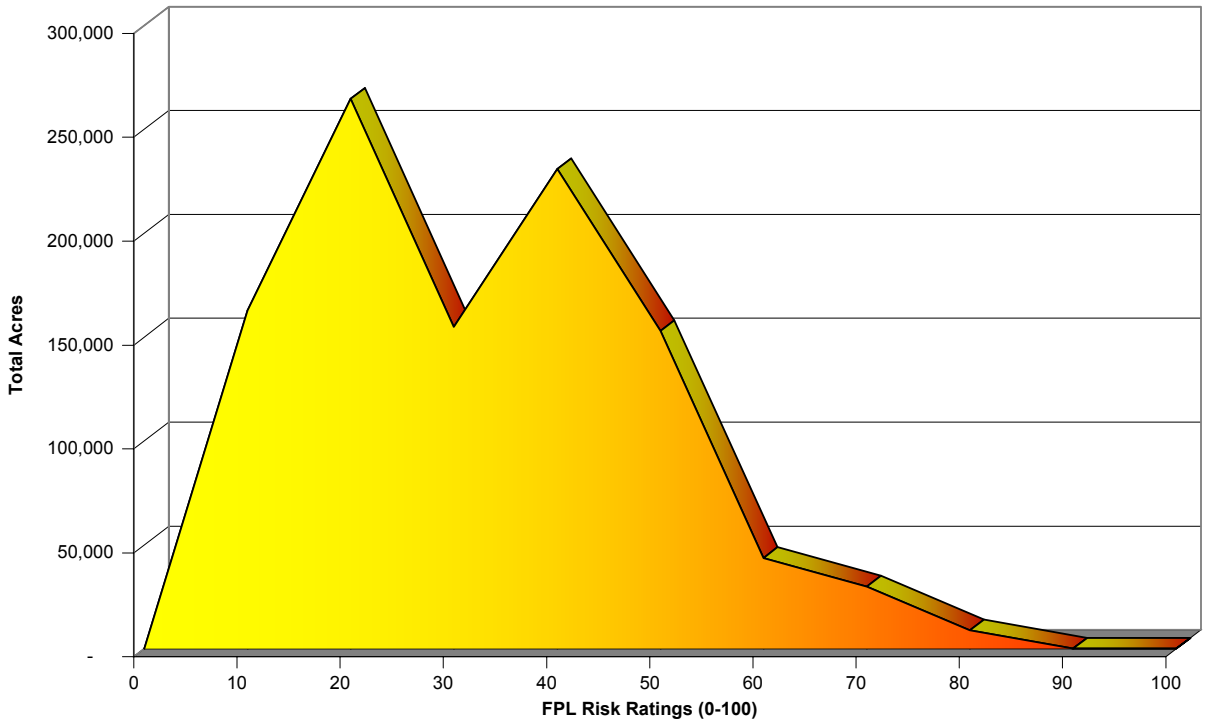
Fire Prone Landscapes: Using the methodology developed by Schlosser *et al.* (2002), and refined for this project, the factors detailed above were used to assess the potential for the landscape to burn during the fire season in the case of fire ignition. Specifically, the entire region was evaluated at a resolution of 30 meters (meaning each pixel on the screen represented a 30 meter square on the ground) to determine the propensity for a particular area (pixel) to burn in the case of a wildfire. The analysis involved creating a linear regression analysis within the GIS program structure to assign a value to each significant variable, pixel-by-pixel. The analysis

ranked factors from 0 (little to no risk) to 100 (extremely high risk) based on past fire occurrence.

Table 4.10. Fire Prone Landscape rankings and associated acres in each category for Pondera County.

Color Code	Value	Total Acres	Percent of Total Area
	0	2	0%
	10	162,895	16%
	20	264,719	25%
	30	154,881	15%
	40	230,807	22%
	50	152,912	15%
	60	43,657	4%
	70	29,915	3%
	80	8,897	1%
	90	3	0%
	100	-	0%

Figure 4.2: Distribution of area by Fire Prone Landscape Class.



The risk category values developed in this analysis should be considered **ordinal data**, that is, while the values presented have a meaningful ranking, they neither have a true zero point nor scale between numbers. Rating in the “40” range is not necessarily twice as “risky” as rating in the “20” range. These category values also do not correspond to a rate of fire spread, a fuel loading indicator, or measurable potential fire intensity. Each of those scales is greatly

influenced by weather, seasonal and daily variations in moisture (relative humidity), solar radiation, and other factors. The risk rating presented here serves to identify where certain constant variables are present, aiding in identifying where fires typically spread into the largest fires across the landscape. A map of the Fire Prone Landscapes in Pondera County is included in Appendix I.

4.3.2 Historic Fire Regime

The US Forest Service has provided their assessment of Historic Fire Regimes for western Montana. These measures of forest conditions are the standard method of analysis for the USDA Forest Service. The Historic Fire Regime map is presented in Appendix I.

In the fire-adapted ecosystems of Montana, fire is undoubtedly the dominant process in terrestrial systems that constrain vegetation patterns, habitats, and ultimately, species composition. Land managers need to understand historical fire regimes (that is, fire frequency and fire severity prior to settlement by Euro-Americans) to be able to define ecologically appropriate goals and objectives for an area. Moreover, managers need spatially explicit knowledge of how historical fire regimes vary across the landscape.

Many ecological assessments are enhanced by the characterization of the historical range of variability which helps managers understand: (1) how the driving ecosystem processes vary from site to site; (2) how these processes affected ecosystems in the past; and (3) how these processes might affect the ecosystems of today and the future. Obviously, historical fire regimes are a critical component for characterizing the historical range of variability in the fire adapted ecosystems of Montana. Furthermore, understanding ecosystem departures provides the necessary context for managing sustainable ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

We used a database of fire history studies in the region to develop modeling rules for predicting historical fire regimes (HFRs). Tabular fire-history data was stratified into spatial data ecoregions, potential natural vegetation types (PNVs), slope classes, and aspect classes to derive rule sets which were then modeled spatially. Expert opinion was substituted for a stratum when empirical data was not available.

Fire is the dominant disturbance process that manipulates vegetation patterns in Montana. The HFR data were prepared to supplement other data necessary to assess integrated risks and opportunities at regional and subregional scales.

4.3.2.1 General Limitations

These data were derived using fire history data from a variety of different sources. These data were designed to characterize broad scale patterns of historical fire regimes for use in regional and subregional assessments. Any decisions based on these data should be supported with field verification, especially at scales finer than 1:50,000. Although the resolution of the HFR theme is 30 meter cell size, the expected accuracy does not warrant their use for analyses of areas smaller than about 10,000 acres (for example, assessments that typically require 1:24,000 data).

Table 4.11. Historic Fire Regime by area in Pondera County.

Historic Fire Regime Description	Regime	Acres	Percent
Non-Lethal Fires	I	4,393	0%
Stand Replacement-Short Interval	IV	45,600	4%
Mixed Severity-Short Interval	I	10,836	1%
Mixed Severity-Long Interval	III	56,500	5%
Mixed Severity-High Elevation	III	6,301	1%
Non-forest-Stand Replacement-Short Interva	II	383,944	37%
Non-forest-Mixed Severity-Moderate Interva	III	7,442	1%
Non-forest-Stand Replacement-Moderate Inte	IV	634	0%
Non-forest-Stand Replacement-Long Interval	V	5,091	0%
Agriculture	Agriculture	495,124	47%
Urban	Urban	2,072	0%
Sparce Vegetation	Sparce Vegetation	20,858	2%
Water	Water	9,073	1%
Snow	Snow	820	0%

4.3.3 Fire Regime Condition Class

The US Forest Service has provided their assessment of Fire Regime Condition Class for Pondera County to this Community Wildfire Protection Plan analysis. These measures of forest conditions are the standard method of analysis for the USDA Forest Service.

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarse scale definitions for natural (historical) fire regimes have been developed by Hardy *et al.* (2001) and Schmidt *et al.* (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). 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 include:

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

As scale of application becomes finer these five classes may be defined with more detail, or any one class may be split into finer classes, but the hierarchy to the coarse scale definitions should be retained.

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). Coarse-scale FRCC classes have been defined and mapped by Hardy *et al.* (2001) and Schmidt *et al.* (2001) (FRCC). They include three condition

classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and diseased mortality, grazing, and drought). There are no wildland vegetation and fuel conditions or wildland fire situations that do not fit within one of the three classes.

The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime (Hann and Bunnell 2001, Hardy *et al.* 2001, Schmidt *et al.* 2002). The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

Characteristic vegetation and fuel conditions are considered to be those that occurred within the natural (historical) fire regime. Uncharacteristic conditions are considered to be those that did not occur within the natural (historical) fire regime, such as invasive species (e.g. weeds, insects, and diseases), "high graded" forest composition and structure (e.g. large trees removed in a frequent surface fire regime), or repeated annual grazing that maintains grassy fuels across relatively large areas at levels that will not carry a surface fire. Determination of the amount of departure is based on comparison of a composite measure of fire regime attributes (vegetation characteristics; fuel composition; fire frequency, severity and pattern) to the central tendency of the natural (historical) fire regime. The amount of departure is then classified to determine the fire regime condition class. A simplified description of the fire regime condition classes and associated potential risks are presented in Table 4.12. Maps depicting Fire Regime and Condition Class are presented in Appendix I.

Table 4.12. Fire Regime Condition Class Definitions.

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) is 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 is 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 is high.

The analyses of Fire Regime Condition Class in Pondera County shows that approximately 10% of the County is in Condition Class 1 (low departure), just about 37% is in Condition Class 2 (moderate departure), with the remaining 2% of the area is in Condition Class 3 (high departure)(Table 4.13).

Table 4.13. Fire Regime Condition Class by Area in Pondera County.

Condition Class	Acres	Percent
Low Departure	104,505	10%
Moderate Departure	391,177	37%
High Departure	23,105	2%
Agriculture	495,124	47%
Sparce Vegetation	20,858	2%
Urban	2,072	0%
Water	9,073	1%
Snow	820	0%
Clouds	520	0%

4.3.4 Current Fire Severity

Current fire severity (CFS) is an estimate of the relative fire severity if a fire were to burn a site under its current state of vegetation. In other words, how much of the overstory would be removed if a fire were to burn today. The US Forest Service (Flathead National Forest) did not attempt to model absolute values of fire severity, as there are too many variables that influence fire effects at any given time (for example, temperature, humidity, fuel moisture, slope, wind speed, wind direction). A Current Fire Severity map is depicted in Appendix I.

The characterization of likely fire severity was based upon historic fire regimes, potential natural vegetation, cover type, size class, and canopy cover with respect to slope and aspect. Each cover type was assigned a qualitative rating of fire tolerance based upon likely species composition and the relative resistance of each species to fire. The US Forest Service researchers defined 3 broad classes of fire tolerance: high tolerance (<20 percent post-fire mortality); moderate tolerance (20 to 80 percent mortality); and low tolerance (>80 percent mortality). We would expect that fires would be less severe within cover types comprised by species that have a high tolerance to fire (for example, western larch and ponderosa pine). Conversely, fires would likely burn more severely within cover types comprised by species having a low tolerance to fire (for example grand fir, subalpine fir). Data assignments were based upon our collective experience in the field, as well as stand structure characteristics reported in the fire-history literature. For example, if they estimated that a fire would remove less than 20 percent of the overstory, the current fire severity would be assigned to the non-lethal class (that is, NL). However, if they expected fire to remove more than 80 percent of the overstory, the current fire severity was assigned to a stand replacement class (that is, SR or SR3).

4.3.4.1 Purpose

Fire is a dominant disturbance process in Montana. The likely effect of fire upon vegetation (i.e., current fire severity) is critical information for understanding the subsequent fire effects upon wildlife habitats, water quality, and the timing of runoff. There have been many reports of how fire suppression and timber harvest has affected vegetation patterns, fuels, and fire behavior. The US Forest Service researchers from the Flathead National Forest, derived the current fire

severity theme explicitly to compare with the historical fire regime theme to evaluate how fire severity has changed since Euro-American settlement (that is, to derive fire-regime condition class).

4.3.4.2 General Limitations

These data were designed to characterize broad scale patterns of estimated fire severity for use in regional and subregional assessments. Any decisions based on these data should be supported with field verification, especially at scales finer than 1:100,000. Although the resolution of the CFS theme is 90 meter cell size, the expected accuracy does not warrant their use for analyses of areas smaller than about 10,000 acres (for example, assessments that typically require 1:24,000 data).

A current fire severity rule-set based on historic wildfire occurrence, temperature, relative humidity, and wind speed and direction was developed to determine an "average burn day" for the specific vegetation types in the area. Any user of these data should familiarize themselves with the rule sets to better understand our estimate of current fire severity.

Table 4.14. Current Fire Severity by Area in Pondera County.

Predicted Fire Severity	Regime	Acres	Percent of Area
Mixed Severity-Short Interval	I	8,505	1%
Mixed Severity-Long Interval	III	54,937	5%
Mixed Severity-High Elevation	III	6,034	1%
Stand Replacement	V	52,400	5%
Non-Lethal Fires	I	319	0%
Non-forest-Mixed Severity-Moderate Interval	III	7,400	1%
Non-forest-Stand Replacement-Short Interval	II	383,689	37%
Agriculture	Agriculture	495,124	47%
Urban	Urban	2,072	0%
Sparce Vegetation	Sparce Vegetation	20,858	2%
Water	Water	9,073	1%
Recently Burned Area	Recently Burned Are	1,731	0%
Snow	Snow	820	0%
Non-forest-Stand Replacement-Moderate Interval	IV	634	0%
Non-forest-Stand Replacement-Long Interval	V	5,091	0%

4.3.5 On-Site Evaluations

Fire control and evaluation specialists as well as hazard mitigation consultants evaluated the communities of Pondera County to determine, first-hand, the extent of risk and characteristics of hazardous fuels in the Wildland-Urban Interface. The on-site evaluations have been summarized in the written narratives presented in the following sections.

4.4 Pondera County Conditions

Pondera County is characterized by cold winters and dry summers. Although fairly large, Pondera County is sparsely populated. Much of the county is quite rural, due in large part to the agricultural economy of the region. Farms and ranches tend to be widely spread. Grazing activity on both public and private lands by livestock and wildlife tends to decrease the build up of fine fuel loads; however, this does not drastically reduce the fire potential. The Lewis and

Clark National Forest on the west side of the county provides ample economic and recreational resources. Overcrowded forest conditions in some areas increases the potential for high intensity, possibly stand replacing fires.

The majority of the county is covered by rangelands, much of which has been converted to farm or pasture ground. Undeveloped rangelands are characterized by low growing grasses with occasional clumps of sagebrush or juniper. Developed rangelands are either grazed, thereby keeping the fine fuel buildup to a minimum, or are in various stages of crop production. Agricultural fields are generally not considered to be at high risk of uncontrolled wildland fires; however, fires in this type of vegetation could burn very intensely with large flame lengths depending on the crop type and season. Annual burning of stubble after harvest does, inevitably, lead to escaped grass fires. Usually, these fires are relatively easily controlled at road crossings or by using available farm implements to modify the vegetation in its path.

Since the induction of the Conservation Reserve Program by the federal government, many former crop producing fields have been allowed to return to native grasses. CRP fields are creating a new fire concern all over the West. As thick grasses are allowed to grow naturally year after year, dense mats of dead plant material begin to buildup. Due to the availability of a continuous fuel bed, fires in CRP fields tend to burn very intensely with large flame lengths that often times jump roads or other barriers, particularly under the influence of wind. Many landowners and fire personnel are researching allowable management techniques to deal with this increasing problem. Currently, according to the CRP Handbook, all management must be part of the landowner's Conservation Plan of Operations, which includes burning to reduce the fuel loading, and must be in the best interest of the CRP. Under certain circumstances, burning may be used as a process to enhance or renovate the existing vegetative cover for wildlife, especially if it is overgrown and stagnant. As noted in Montana CRP-542, burning can only be conducted under an approved burn plan by qualified personnel. The County must also issue a burn permit for any controlled burning on CRP fields. CRP contracts can be modified to include the construction of fuel breaks along road corridors or around structures to help reduce wildfire risks.

Human activity is strongly correlated with fire frequency, with increasing numbers of fires as use increases. Discarded cigarettes, tire fires, and hot catalytic converters have increased the number of fires experienced along roadways. Careless and unsupervised use of fireworks also contributes to unwanted and unexpected wildland fires. Further contributing to ignition sources are the debris burners and the practice of ditch burning where fire is used to rid ditches of weeds and other burnable materials.

4.5 Pondera County's Wildland Urban Interface

The Wildland-Urban Interface (WUI) has gained attention through efforts targeted at wildfire mitigation; however, this analysis technique is also useful when considering other hazards because the concept looks at where people and structures are concentrated in any particular region. For Pondera County, the WUI shows the relative concentrations of structures scattered across the county.

A key component in meeting the underlying need for protection of people and structures is the protection and treatment of hazards in the wildland-urban interface. The wildland-urban interface refers to areas where wildland vegetation meets urban developments, or where forest or rangeland fuels meet urban fuels in the case of wildfires (such as houses). These areas encompass not only the interface (areas immediately adjacent to urban development), but also the continuous slopes that lead directly to a risk to urban developments. Reducing the hazard in the wildland urban interface requires the efforts of federal, state, and local agencies and private

individuals (Norton 2002). “The role of [most] federal agencies in the wildland-urban interface includes wildland firefighting, hazard fuels reduction, cooperative prevention and education and technical experience. Structural fire protection [during a wildfire] in the wildland urban interface is [largely] the responsibility of Tribal, state, and local governments” (USFS 2001). Property owners share a responsibility to protect their residences and businesses and minimize danger by creating defensible areas around them and taking other measures to minimize the risks to their structures (USFS 2001). With treatment, a wildland-urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend communities against other hazard risks. In addition, a wildland-urban interface that is properly thinned will be less likely to sustain a crown fire that enters or originates within it (Norton 2002).

By reducing hazardous fuel loads, ladder fuels, and tree densities, and creating new and reinforcing defensible space, landowners would protect the wildland-urban interface, the biological resources of the management area, and adjacent property owners by:

- minimizing the potential of high-severity ground or crown fires entering or leaving the area;
- reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers (firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior (McCoy *et al.* 2001);
- improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

Three wildland-urban interface conditions have been identified (Federal Register 66(3), January 4, 2001) for use in wildfire control efforts. These include the Interface Condition, Intermix Condition, and Occluded Condition. Descriptions of each are as follows:

- **Interface Condition** – a situation where structures abut wildland fuels. There is a clear line of demarcation between the structures and the wildland fuels along roads or back fences. The development density for an interface condition is usually 3+ structures per acre;
- **Intermix Condition** – a situation where structures are scattered throughout a wildland area. There is no clear line of demarcation, the wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres;
- **Occluded Condition** – a situation, normally within a city, where structures abut an island of wildland fuels (park or open space). There is a clear line of demarcation between the structures and the wildland fuels along roads and fences. The development density for an occluded condition is usually similar to that found in the interface condition and the occluded area is usually less than 1,000 acres in size; and

In addition to these classifications detailed in the Federal Register, four additional classifications of population density have been included to augment these WUI categories:

- **Rural Condition** – a situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters.
- **High Density Urban** – those areas generally identified by the population density consistent with the location of incorporated cities, however, the boundary is not necessarily set by the location of city boundaries: it is set by very high population

densities (more than 7-10 structures per acre or more). Many counties and reservations in the west do not have high density urban areas. Pondera County, Montana, was determined not to have any areas of high density urban based on current (2006) structure locations.

- **Infrastructure WUI** – those locations where critical and identified infrastructure are located outside of populated regions and may include high tension power line corridors, critical escape or primary access corridors, municipal watersheds, areas immediately adjacent to facilities in the wildland such as radio repeater towers or fire lookouts. These are identified by county or reservation level planning committees.
- **Non-WUI Condition** - a situation where the above definitions do not apply because of a lack of structures in an area or the absence of critical infrastructure crossing these unpopulated regions. This classification is not WUI.

In summary, WUI designations by the Pondera County planning committee includes:

- Interface Areas: WUI
- Intermix Areas: WUI
- Occluded Areas: Not Present
- Rural Areas: WUI
- Infrastructure Areas: Not Present
- High Density Urban: WUI
- Non-WUI Condition: Present, but not WUI

The locations of structures in Pondera County have been mapped and are presented on a variety of map products in this analysis document; specifically in Appendix I. The location of all structures was determined by examining remotely sensed images. Detailed information was garnered from digital ortho-photos at a resolution of 1 meter (from 1998). These records were augmented with structure data provided by the Pondera County GIS department.

All structures are represented by a “dot” on the map. No differentiation is made between a garage and a home, or a business and a storage building. The density of structures and their specific locations in this management area are critical in defining where the potential exists for casualty loss in the event of a disaster in the region.

By evaluating this structure density, WUI areas can be defined on maps by using mathematical formulae and population density indexes to define the WUI based on where structures are located. The resulting population density indexes create concentric circles showing high density areas of Interface and Intermix WUI, as well as Rural WUI (as defined above). This portion of the analysis allows us to “see” where the highest concentrations of structures are located in reference to high risk landscapes, limiting infrastructure, and other points of concern. This mapping procedure was followed and is presented in the maps included in the Appendix I.

The Healthy Forests Restoration Act makes a clear designation that the location of the WUI is at the determination of the County or Reservation when a formal and adopted Community Wildfire Protection Plan is in place. It further states that the Federal Agencies are obligated to use this WUI designation for all Healthy Forests Restoration Act purposes. The Pondera County Community Wildfire Protection Plan committee evaluated a variety of different approaches to determining the WUI for the County and selected this approach and has adopted it for these purposes. In addition to a formal WUI map for use with the Federal Agencies, it is hoped that it will serve as a planning tool for the county and local fire districts.

A map of the Wildland Urban Interface in Pondera County as defined by the Community Wildfire Protection Plan committee is included in Appendix I.

4.5.1 Potential WUI Treatments

The definition and mapping of the WUI is the creation of a planning tool to identify where structures, people, and infrastructure are located in reference to each other. This analysis tool does not include a component of fuels risk. There are a number of reasons to map and analyze these two components separately (population density vs. fire risk analysis). The primary among these reasons is the fact that population growth often occurs independent from changes in fire risk, fuel loading, and infrastructure development. Thus, making the definition of the WUI dependant on all of them would eliminate populated places with a perceived low level of fire risk today, which may in a year become an area at high risk due to forest or rangeland health issues or other concerns.

By examining these two tools separately the planner is able to evaluate these layers of information to see where the combination of population density overlays areas of high current fire risk and then take mitigative actions to reduce the fuels, improve readiness, directly address factors of structure ignitability, improve initial attack success, mitigate resistance to control factors, or (more often) a combination of many approaches.

It should not be assumed that just because an area is identified as WUI, that it will therefore receive treatments because of this identification alone. Nor should it be implicit that all WUI treatments will be the application of the same prescription. Instead, each location targeted for treatments must be evaluated on its own merits: factors of structural ignitability, access, resistance to control, population density, resources and capabilities of firefighting personnel, and other site specific factors.

Most treatments may begin with the home evaluation, the implicit factors of structural ignitability (roofing, siding, deck materials), and vegetation within the treatment area of the structure. However, treatments in the low population areas of rural lands (mapped as yellow) may look closely at access (two ways in and out) and communications through means other than land based telephones. On the other hand, the subdivision with densely packed homes (mapped as brown – interface areas) surrounded by forests and dense underbrush, may receive more time and effort implementing fuels treatments beyond the immediate home site to reduce the probability of a crown fire entering the subdivision.

4.6 Pondera County Communities At Risk

Individual community assessments have been completed for all of the populated places in the county. The following summaries include these descriptions and observations. Local place names identified during this plan's development include:

Table 4.15. Pondera County Communities

Community Name	Planning Description	Vegetative Community	National Register Community At Risk?[1]
Conrad	City	Rangeland	No
Valier	City	Rangeland	No
Brady	Community	Rangeland	No
Dupuyer	Community	Rangeland	No
Heart Butte	Community	Rangeland	Yes
Ledger	Community	Rangeland	No

[1]Those communities with a "Yes" in the National Register Community at Risk column are included in the Federal Register, Vol. 66, Number 160, Friday, August 17, 2001, as "Urban Wildland Interface Communities within the vicinity of Federal Lands that are at high risk from wildfires". All of these communities have been evaluated as part of this plan's assessment.

Site evaluations on these communities are included in subsequent sections.

4.7 Communities in Pondera County

4.7.1 Overall Fuels Assessment

The suitability of the lands within Pondera County to agriculture has led to a profusion of farming and ranching activity. Irrigated fields and pastures dominate the rolling hills and flat lands east of the Lewis and Clark National Forest. In areas unreachable by irrigation waters, native grasslands stretch relatively unbroken for many miles. These low growing grasses are somewhat sparse; however, they would provide a consistent fuel bed for rapidly spreading rangeland fires. Agricultural or CRP fields can also serve to fuel a fire after curing; burning in much the same manner as consistent grass fuels. Fires in grass and rangeland fuel types tend to burn at relatively low intensities, with moderate flame lengths and only short-range spotting. Suppression resources are generally quite effective in such fuels. Homes and other improvements can be easily protected from the direct flame contact and radiant heat through adoption of precautionary measures around the structure.

Although fires in these fuels may not present the same control problems as those associated with large, high intensity fires in timber fuel types, they can cause significant damage if precautionary measures have not taken place prior to a fire event. Wind driven fires in these short grass fuel types spread rapidly and can be difficult to control. During extreme drought and pushed by high winds, fires in these fuel types can exhibit extreme rates of spread, thwarting suppression efforts. The fires within the Missouri Breaks Complex of 2003 not only demonstrate the potential for fires in these fuels to reach enormous size, they also demonstrate fire behavior atypical of the fuels.

The combination of farming and livestock production has generally led to a landscape that is at low potential for wildland fire. Irrigated or cultivated fields surround nearly all community centers, with natural or man-made fire breaks such as roads separating the agricultural fields from structures. This reduces the potential for infringement by wildland fire. The overall threat to structures and communities in the agricultural portion of the County is quite low.

However, there are areas of notable exception within the County. Forested lands flank the western portion of the county along the Lewis and Clark National Forest. Many of these forest types are dry Douglas-fir and Engelmann spruce forests that have become heavily overstocked, resulting in multistoried conditions with abundant ladder fuels. Increased activities by pathogens will continue to increase levels of dead and down fuel, as host trees succumb to insect attack and stand level mortality increases. Overstocked, multi-layered stands and the abundance of ladder fuels lead to horizontal and vertical fuel continuity in many stands. These conditions, combined with an arid and often windy environment, can encourage the development of stand replacing fires. These fires can burn with very high intensities and generate large flame lengths and fire brands that can be lofted long distances. Such fires present significant control problems for suppression resources, often developing into large, destructive wildland fires.

Examples of large, stand replacing fires can be seen throughout the Rocky Mountains. These fire events threaten natural resource values as well as homes and other improvements important to Pondera County residents.

4.7.2 Overall Mitigation Activities

There are many specific actions that will help improve the safety in a particular area; however, there are also many potential mitigation activities that apply to all residents and all fuel types. General mitigation activities that apply to all of Pondera County are discussed below while area specific mitigation activities are discussed within the individual community assessments.

The safest, easiest, and most economical way to mitigate unwanted fires is to stop them before they start. Generally, prevention actions attempt to prevent human-caused fires. Campaigns designed to reduce the number and sources of ignitions can be quite effective. Prevention campaigns can take many forms. Traditional “Smokey Bear” type campaigns that spread the message passively through signage can be quite effective. Signs that remind folks of the dangers of careless use of fireworks, burning when windy, and leaving unattended campfires can be quite effective.

Active prevention techniques involve mass media, radio, or the local newspapers. Fire districts in other counties have contributed to the reduction in human-caused ignitions by running a weekly “run blotter,” similar to a police blotter, each week in the paper. The blotter briefly describes the runs of the week and is followed by a “tip of the week” to reduce the threat from wildland and structure fires. The federal government as well as the Montana Department of Natural Resources and Conservation have been a champion of prevention, and could provide ideas for such tips. When fire conditions are high, brief public service messages could warn of the hazards of misuse of fire or any other ignition sources.

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Pondera County must be made aware that home defensibility starts with the homeowner. Once a fire has started and is moving toward a structure or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space. Residents of Pondera County should be encouraged to work with local fire departments and fire management agencies within the county to complete individual home site evaluations. Home defensibility steps should be enacted based on the results of these evaluations. Beyond the homes, forest management efforts must be considered to slow the approach of a fire that threatens a community. The survey of the public conducted during the preparation of this Community Wildfire Protection Plan indicated that approximately 47% of the respondents are interested in participating in wildfire education programs.

Also of vital importance is the accessibility of the homes to emergency apparatus. The fate of the home often will be determined by homeowner actions prior to the event. Homes’ survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or mowing driveways and creating a turnaround area for large vehicles.

Recreational facilities, such as the Swift Reservoir area, should be kept clean and maintained. In order to mitigate the risk of an escaped campfire, escape proof fire rings and barbeque pits should be installed and maintained. Surface fuel accumulations can also be kept to a minimum by periodically mowing or conducting prescribed burns.

Other actions to reduce fire hazards are creating fire resistant buffers along roads and power line corridors and strictly enforcing fire-use regulations. High tension power lines coming from Teton and Glacier Counties are the only sources of electrical power to Pondera County; thus, protecting these corridors is a high priority. Ensuring that the area beneath the lines has been

cleared of potential high risk fuels and making sure that the buffer between the surrounding rangelands is wide enough to adequately protect the poles as well as the lines is imperative.

Once a fire has started, how much and how large it burns is often dependent on the availability of suppression resources. In most cases, rural fire departments are the first to respond and have the best opportunity to halt the spread of a wildland fire. For many districts, the ability to reach these suppression objectives is largely dependent on the availability of functional resources and trained individuals. Increasing the capacity of departments through funding and equipment acquisition can improve response times and subsequently reduce the potential for resource loss.

In order to assure a quick and efficient response to an event, emergency responders need to know specifically where emergency services are needed. Continued improvement and updating of the rural addressing system is necessary to maximize the effectiveness of a response.

Other specific mitigation activities are likely to include improvement of emergency water supplies, management of decadent shelterbelts, and fuels reduction along roads and power line right-of-ways. Furthermore, building codes should be revised to provide for more fire conscious construction techniques such as using fire resistant siding, roofing, and decking.

4.7.3 Individual Community Assessments

4.7.3.1 Conrad

Conrad is a small agriculturally-based community in the center of Pondera County. Conrad is the largest town and serves not only as the county seat, but is also the commercial and economic hub of Pondera County.

4.7.3.1.1 Fire Potential

The fuels surrounding Conrad consist primarily of agricultural development and native rangelands. The topography is relatively flat with occasional rolling hills. There are also patches of livestock pasture and CRP fields that add to the potential fuel complex. Agriculture and ranching activities dominate the landscape resulting in a discontinuous pattern of native fuels. A wind-driven fire in the dry native fuel complexes would produce a rapidly advancing, but variable intensity fire. Fires burning in some types of unharvested fields would be expected to burn more intensely with larger flame lengths due to the greater availability of fuels. Agricultural fields currently managed under the Crop Reserve Program (CRP) burn very intensely due to an increased amount of fuels, particularly dead grasses from previous years. Larger flame lengths and intense heat make fires in CRP fields difficult to control. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Nevertheless, many homeowners maintain groomed yards or are surrounded by agricultural fields; thus, decreasing the risk of a wildland fire threatening structures. Grazing around homes and communities helps decrease build up of fine fuel loads. Livestock grazing can be an effective tool to reduce the primary fuel load component of the arid rangeland ecosystem.

In this part of Montana, lightning is a significant source of ignitions, but vehicle use on and off roads also has the potential to ignite fires. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Farm equipment, ATV's, and pick ups are used regularly for farming purposes and recreational operations. Many trains travel through the Conrad area daily on the Burlington Northern rail lines that parallel Interstate 15. Sparks from the trains' passage ignite several fires each year.

Stubble fires escape landowner's boundaries relatively regularly. These fires are generally quickly suppressed by modifying the vegetation with available farm implements and homes are rarely threatened.

4.7.3.1.2 Ingress-Egress

The primary ingress and egress to Conrad from either the north or the south is Interstate 15. This is a well traveled, four-lane, divided highway. State Routes 218 and 219 also provide paved, two-lane routes into Conrad from east or southwest, respectively. In addition, there are numerous graveled secondary routes crisscrossing the area. The Burlington Northern rail line parallels Interstate 15 through Conrad offering freight services only.

4.7.3.1.3 Infrastructure

Residents within the city limits of Conrad have access to the municipal water system; however, outlying homes, farms, and ranches rely on personal or multiple-structure well systems or water piped from Tiber Reservoir. Supplementary wells have also been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that service the pumps were compromised.

Several main power lines converge near Conrad with smaller, above ground distribution lines serving most of the townsite and rural homes. There is also an oil pipeline that passes about two miles south of Conrad and extends towards Cut Bank to the north and Great Falls to the south. Numerous oil fields dot the landscape around Conrad often in the middle of remote fields.

4.7.3.1.4 Fire Protection

The city of Conrad as well as much of central Pondera County has structural and wildland fire protection provided by the Conrad Volunteer Fire Department.

All fifty-six Montana Counties are currently enrolled in the State/County Cooperative Fire program. According to agreements signed with the state, each county is obligated to fight wildland fire on all state and private ground not covered by an existing fire agency. The Montana Department of Natural Resources and Conservation, in turn, assists counties when fires exceed their capability, provides training in wildland fire fighting, administrative support to county fire agencies through involvement in the County Rural Fire Councils and Fire Protective Associations, as well as the loan of Federal Excess Personal Property (FEPP) fire equipment. The Pondera County Fire District also has a mutual aid agreement directly with the Montana Department of Natural Resources and Conservation.

4.7.3.1.5 Community Risk Assessment

Residents of Conrad have a moderate risk of experiencing a wildland fire due to the extensive agricultural development. However, farming and ranching activities throughout the area increase the risk of a man-caused wildfire spreading to the community. Large expanses of CRP fields provide a continuous fuel bed extending for several miles that has the potential to threaten many homes and farmsteads along the way. Fields enrolled in the CRP program have high accumulations of fuels and are typically problematic to access due to the lack of roads making fire suppression difficult and potentially dangerous. In addition, the frequent passage of trains along Interstate 15 significantly increases the likelihood of an ignition near the community or along one the primary access route.

Under extreme weather conditions, escaped agricultural fires could potentially threaten individual homes or the townsite; however, this type of fire is usually quickly controlled. The Conrad area experiences frequent high winds, which generally increase the rate of fire spread and intensity of rangeland fires. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.7.3.1.6 Mitigation Activities

As with all other communities, constructing a defensible space around homes, businesses, and other structures is one of the most effective ways to protect them from wildfire. In the Conrad area, this will likely include mowing and removing weeds and other vegetation from around structures and moving flammable items such as propane tanks and wood piles a safe distance away. Maintaining a clean and green yard around homes and farmsteads is also an effective fire mitigation measure. Additionally, using fire resistant siding, decking, and roofing will help reduce the ignitability of the structure.

Designing a plan to help firefighters control CRP fires would significantly lessen the fire danger to the community. Mitigation associated with this type of fire might include plowing a fire resistant buffer zone around fields and along pre-designed areas to tie into existing natural or manmade barriers or implementing a prescribed burning regimen during less risky seasons of the year.

Roads and rail lines can be made more fire resistant by frequently mowing along the edges to reduce the fuels or planting more fire resistant grasses in these highly prone areas. Aggressive initial attack on fires occurring along travel routes will help insure that these ignitions do not spread to nearby home sites.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.7.3.2 Brady

Brady is a rural farming community located along Interstate 15 in southern Pondera County. There is a small city center; however, most residents live on farms and ranches in the surrounding area.

4.7.3.2.1 Fire Potential

Fuels surrounding Brady consist primarily of dryland crops and CRP fields. There are very few low growing shrubs and the only trees that exist are generally ornamentals planted in residents' yards. Farming activities dominate the landscape, resulting in a discontinuous pattern of native fuels. A wind-driven fire in the dry native fuel complexes would produce a rapidly advancing, but variable intensity fire. Agricultural fields currently managed under the Crop Reserve Program (CRP) and fields set in fallow burn very intensely due to an increased amount of fuels, particularly dead grasses from previous years. Larger flame lengths and intense heat make fires in CRP fields difficult to control. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Nevertheless, many homeowners maintain groomed yards or are surrounded by planted fields; thus, decreasing the risk of a wildland fire threatening structures. Grazing around homes and communities helps decrease

build up of fine fuel loads. Livestock grazing can be an effective tool to reduce the primary fuel load component of the arid rangeland ecosystem.

In this part of Montana, lightning is a significant source of ignitions, but vehicle use on and off roads also has the potential to ignite fires. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Farm equipment, ATV's, and pick ups are used regularly for farming purposes and recreational operations. Many trains travel through the Brady area daily on the Burlington Northern rail lines that parallel Interstate 15. Sparks from the trains' passage ignite several fires each year.

Stubble fires escape landowner's boundaries relatively regularly. These fires are generally quickly suppressed by modifying the vegetation with available farm implements and homes are rarely threatened.

4.7.3.2.2 Ingress-Egress

Like Conrad, the primary access route for Brady area is Interstate 15. Interstate 15 Business Route also provides a paved, two-lane access north from Brady to Conrad. State Route 365 is a paved, two lane road traveling eastward from Brady. There are also numerous gravel secondary routes throughout the area that access many of the rural farms and ranches.

4.7.3.2.3 Infrastructure

The community of Brady and structures in the outlying areas all depend on personal or multiple structure well systems. Supplementary wells have also been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that service the pumps were compromised.

There are numerous main power lines roughly paralleling Interstate 15 through the Brady area. An oil pipeline runs about six miles east of the community center.

A Burlington Northern rail line also parallels Interstate 15 through the town site; however, Conrad is the only loading and unloading stop the train makes in Pondera County.

4.7.3.2.4 Fire Protection

The community of Brady as well as much of southern Pondera County has structural and wildland fire protection provided by the Brady Rural Fire Department.

All fifty-six Montana Counties are currently enrolled in the State/County Cooperative Fire program. According to agreements signed with the state, each county is obligated to fight wildland fire on all state and private ground not covered by an existing fire agency. The Montana Department of Natural Resources and Conservation, in turn, assists counties when fires exceed their capability, provides training in wildland fire fighting, administrative support to county fire agencies through involvement in the County Rural Fire Councils and Fire Protective Associations, as well as the loan of Federal Excess Personal Property (FEPP) fire equipment. The Pondera County Fire District also has a mutual aid agreement directly with the Montana Department of Natural Resources and Conservation.

4.7.3.2.5 Community Risk Assessment

Residents of Brady have a moderate risk of experiencing a wildland fire due to the relatively flat topography and relatively sparse vegetation surrounding most structures. However, agricultural

activities throughout the area and heavy traffic on the highway and rail lines increase the risk of a man-caused wildfire spreading to the community. It is important that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

Under extreme weather conditions, escaped agricultural fires could potentially threaten individual homes or the townsite; however, this type of fire is usually quickly controlled. The Brady area experiences frequent high winds, which generally increase the rate of fire spread and intensity of rangeland fires. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.7.3.2.6 Mitigation Activities

As with all other communities, constructing a defensible space around homes, businesses, and other structures is one of the most effective ways to protect them from wildfire. In the Brady area, this will likely include mowing and removing weeds and other vegetation from around structures and moving flammable items such as propane tanks and wood piles a safe distance away. Maintaining a clean and green yard around home sites is also an effective fire mitigation measure. Additionally, using fire resistant siding, decking, and roofing will help reduce the ignitability of the structure.

Designing a plan to help firefighters control CRP fires would significantly lessen the fire danger to the community. Mitigation associated with this type of fire might include plowing a fire resistant buffer zone around fields and along pre-designed areas to tie into existing natural or manmade barriers or implementing a prescribed burning regimen during less risky seasons of the year.

Roads and rail lines can be made more fire resistant by mowing along the edges frequently to reduce the fuels or planting more fire resistant grasses in these highly prone areas. Aggressive initial attack on fires occurring along travel routes will help insure that these ignitions do not spread.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.7.3.3 Dupuyer

There are very few residents remaining in the immediate Dupuyer area. Although there is an identified community center, most residents are larger landowners in the surrounding area. Dupuyer is located in western Pondera County where U.S Highway 89 crosses Dupuyer Creek. The Lewis and Clark National Forest backdrops the community center about 15 miles to the west.

4.7.3.3.1 Fire Potential

Fuels surrounding Dupuyer consist primarily of native rangeland grasses, livestock pasture, and some crop fields (mostly hay). Ranching activities and native grasslands dominate the landscape resulting in a discontinuous pattern of native fuels. A wind-driven fire in the dry native fuel complexes would produce a rapidly advancing, but variable intensity fire. Fires burning in

some types of unharvested fields would be expected to burn more intensely with larger flame lengths due to the greater availability of fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Winds in the Dupuyer area tend to come from the west or southwest; thus, it is possible that a forest fire could be pushed eastward out of the mountains to threaten residents in the Dupuyer area. Nevertheless, many homeowners maintain groomed yards or are surrounded by agricultural fields; thus, decreasing the risk of a wildland fire threatening structures. Grazing around homes and communities helps decrease build up of fine fuel loads. Livestock grazing can be an effective tool to reduce the primary fuel load component of the arid rangeland ecosystem.

Dupuyer Creek, a fairly wide and shallow stream, runs along the north end of the community. Denser fuels within the creek bed, such as black cottonwoods, willows, and other riparian vegetation, may sustain a more intense fire during the summer and early fall as the water level goes down. However, riparian areas in this part of Montana are more susceptible to ignitions during the winter months due to the lack of fuel moisture and the Chinook winds.

In this part of Montana, lightning is a significant source of ignitions, but vehicle use on and off roads also has the potential to ignite fires. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Farm equipment, ATV's, and pick ups are used regularly for farming purposes and recreational operations. Stubble fires escape landowner's boundaries relatively regularly. These fires are generally quickly suppressed by modifying the vegetation with available farm implements and homes are rarely threatened. Mechanized equipment used in the extraction of oil also has the potential to ignite fires, particularly due to their typically remote location.

4.7.3.3.2 Ingress-Egress

The primary access into Dupuyer is provide by U.S. Highway 89, a paved, two-lane route. The Conrad - Dupuyer Road heading east of Dupuyer provides an additional graveled route to Conrad. Swift Dam Road and Dupuyer Creek Road are two graveled routes that travel west from Dupuyer towards the Lewis and Clark National Forest.

4.7.3.3.3 Infrastructure

All structures and livestock watering troughs in the Dupuyer area rely on personal or multiple structure well systems. Supplementary wells have also been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

There are no main power lines in the Dupuyer area; however, there are several above ground distribution lines providing power to local homes, ranches, and farmsteads. Additonally, there are numerous oil fields dotting the landscape surrounding Dupuyer often in the middle of remote agricultural fields or rangelands.

4.7.3.3.4 Fire Protection

The community of Dupuyer and the surrounding area (extending north to the Reservation boundary) has structural and wildland fire protection provided by the Dupuyer Rural Fire Department.

All fifty-six Montana Counties are currently enrolled in the State/County Cooperative Fire program. According to agreements signed with the state, each county is obligated to fight wildland fire on all state and private ground not covered by an existing fire agency. The Montana

Department of Natural Resources and Conservation, in turn, assists counties when fires exceed their capability, provides training in wildland fire fighting, administrative support to county fire agencies through involvement in the County Rural Fire Councils and Fire Protective Associations, as well as the loan of Federal Excess Personal Property (FEPP) fire equipment. The Pondera County Fire District also has a mutual aid agreement directly with the Montana Department of Natural Resources and Conservation.

4.7.3.3.5 Community Risk Assessment

Residents of Dupuyer have a moderate risk of experiencing a wildland fire due to the relatively flat topography and sparse vegetation surrounding most structures. However, ranching and farming activities throughout the area increase the risk of a man-caused wildfire spreading to the community. There is a possibility that a wildfire in the forestlands to the west could be pushed towards the Dupuyer community by local winds. Additionally, the more dense fuels located along the Dupuyer Creek corridor could carry a wildfire straight into the community threatening several structures along the creek. Fires in streams and coulees can be difficult to suppress due to the more dense fuels and lack of direct access. It is important that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.7.3.3.6 Mitigation Activities

Constructing a defensible space around homes and other structures is one of the most effective ways to protect them from wildfire. In the very rural Dupuyer area, this will likely include mowing and removing weeds and other vegetation from around structures and moving flammable items such as propane tanks and wood piles a safe distance away. Maintaining a clean and green yard around home sites is also an effective fire mitigation measure. Additionally, using fire resistant siding, decking, and roofing will help reduce the ignitability of the structure. Homes along Dupuyer Creek should take extra precautions to separate structures from hazardous fuels located within the stream bed and keep a clean and green lawn between them.

Designing a plan to help firefighters control CRP fires would significantly lessen the fire danger to the community. Mitigation associated with this type of fire might include plowing a fire resistant buffer zone around fields and along pre-designed areas to tie into existing natural or manmade barriers or implementing a prescribed burning regimen during less risky seasons of the year.

Road corridors can be made more fire resistant by mowing along the edges frequently to reduce the fuels or planting more fire resistant grasses in these highly prone areas. Aggressive initial attack on fires occurring along travel routes will help insure that these ignitions do not spread.

4.7.3.4 Valier

Valier is a small, agriculturally based community located on the northeast shore of Lake Frances. This area is relatively flat and surrounded by crop fields and native rangelands. Lake Frances is a man-made reservoir that supports the area's irrigation systems as well as numerous recreational activities including fishing, bird watching, boating, and camping.

4.7.3.4.1 Fire Potential

Fuels surrounding Valier consist primarily of agricultural fields, native rangelands, and livestock pastures. Farming and ranching activities dominate the landscape resulting in a discontinuous pattern of native fuels. A wind-driven fire in the dry native fuel complexes would produce a rapidly advancing, but variable intensity fire. Fires burning in some types of unharvested fields would be expected to burn more intensely with larger flame lengths due to the greater availability of fuels. Agricultural fields currently managed under the Crop Reserve Program (CRP) and fields set in fallow burn very intensely due to an increased amount of fuels, particularly dead grasses from previous years. Larger flame lengths and intense heat make fires in CRP fields difficult to control. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Nevertheless, many homeowners maintain groomed yards or are surrounded by agricultural fields; thus, decreasing the risk of a wildland fire threatening structures. Grazing around homes and communities helps decrease build up of fine fuel loads. Livestock grazing can be an effective tool to reduce the primary fuel load component of the arid rangeland ecosystem.

Lake Frances is surrounded by a natural shoreline consisting of marshy areas and native grasses. During periods of low lake levels, these more productive grasses may dry out and become available to burn. The risk of an ignition is higher around the lake due to increased human activities. Potential ignition sources would include campfires, BBQ pits, boat motors, etc. A fire in these fuels would burn more intensely than the surrounding rangelands due to taller and denser fuels.

In this part of Montana, lightning is a significant source of ignitions, but vehicle use on and off roads also has the potential to ignite fires. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Farm equipment, ATV's, and pick ups are used regularly for farming purposes and recreational operations. Stubble fires escape landowner's boundaries relatively regularly. These fires are generally quickly suppressed by modifying the vegetation with available farm implements and homes are rarely threatened.

4.7.3.4.2 Ingress-Egress

The primary access route into Valier is State Route 44 from either the east (Interstate 15) or the west (U.S. Highway 89). This is a paved, two lane road bordered by crop fields and native rangelands. An additional highway, State Route 358, is a paved, two lane corridor heading north from Valier towards Cut Bank. There are also numerous gravel secondary routes crisscrossing the area that provide access to individual homes, ranches, and farmsteads in the surrounding area.

4.7.3.4.3 Infrastructure

Residents and businesses within the Valier city limits have access to a municipal water system, but structures in the surrounding area rely on personal or multiple structure well systems. Supplementary wells have also been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

The main power lines and oil pipelines are located about nine miles east of Valier; however, there are numerous above ground distribution lines supplying power to area residents.

A spur from the main Burlington Northern rail line near Interstate 15 dead ends in Valier.

4.7.3.4.4 Fire Protection

The Valier Volunteer Fire Department provides structural and wildland fire protection to the Town of Valier and the surrounding area.

All fifty-six Montana Counties are currently enrolled in the State/County Cooperative Fire program. According to agreements signed with the state, each county is obligated to fight wildland fire on all state and private ground not covered by an existing fire agency. The Montana Department of Natural Resources and Conservation, in turn, assists counties when fires exceed their capability, provides training in wildland fire fighting, administrative support to county fire agencies through involvement in the County Rural Fire Councils and Fire Protective Associations, as well as the loan of Federal Excess Personal Property (FEPP) fire equipment.

4.7.3.4.5 Community Risk Assessment

Residents of Valier have a moderate risk of experiencing a wildland fire due to the relatively flat topography and agricultural development surrounding most structures. However, ranching and farming activities throughout the area increase the risk of a man-caused wildfire spreading to the community. Additionally, the denser fuels located around Lake Frances could support a more intense wildfire with the potential to spread to the adjacent community. Fires around the lake may be difficult to suppress due to the lack of direct access and sensitivity of the wetlands and wildlife. It is important that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

Under extreme weather conditions, escaped agricultural fires could potentially threaten individual homes or the townsite; however, this type of fire is usually quickly controlled. The Valier area experiences frequent high winds, which generally increase the rate of fire spread and intensity of rangeland fires. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.7.3.4.6 Mitigation Activities

Constructing a defensible space around homes and other structures is one of the most effective ways to protect them from wildfire. In the Valier area, this will likely include mowing and removing weeds and other vegetation from around structures and moving flammable items such as propane tanks and wood piles a safe distance away. Maintaining a clean and green yard around home sites is also an effective fire mitigation measure. Additionally, using fire resistant siding, decking, and roofing will help reduce the ignitability of the structure. Homes closer to Lake Frances should take extra precautions to separate structures from hazardous fuels located on the shoreline and keep a clean and green lawn.

Designing a plan to help firefighters control CRP fires would significantly lessen the fire danger to the community. Mitigation associated with this type of fire might include plowing a fire resistant buffer zone around fields and along pre-designed areas to tie into existing natural or manmade barriers or implementing a prescribed burning regimen during less risky seasons of the year.

Road corridors can be made more fire resistant by mowing along the edges frequently to reduce the fuels or planting more fire resistant grasses in these highly prone areas. Aggressive initial attack on fires occurring along travel routes will help insure that these ignitions do not spread.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.7.3.5 Heart Butte

Heart Butte is a small community on the Blackfeet Indian Reservation in northwest Pondera County. The townsite and scattered residences lie at the base of the Rocky Mountain Front near the confluence of the North Fork and the South Fork on Whitetail Creek. There are also numerous pothole-type lakes throughout the area.

4.7.3.5.1 Fire Potential

Many of the homes in Heart Butte are surrounded by native grasses, which extends to the east. Scattered limber pine and stunted Douglas-fir occur on the moderate slopes along the west side of the community; becoming somewhat denser further to the west. Mature limber pine are naturally short to moderately tall trees that grow in well-spaced stands. The understory of this sparsely forested stand is generally made up of native grass and a few low-growing shrubs. Fires in these fuels are typically infrequent, but burn at high intensities usually resulting in stand-replacement. The topography is relatively gentle and rolling, but becomes much steeper in the mountains immediately to the west.

Homes closer to the Lewis and Clark National Forest boundary sit within the limber pine to Douglas-fir/spruce transition zone. Fuel loading in predominantly Douglas-fir stands is much higher than limber pine stands. Increased dead and down fuels, increased stand density, and increased understory vegetation results in a much hotter and more unpredictable wildfire. Crowning, spotting, and torching of individual trees also makes direct attack suppression efforts difficult and dangerous for firefighters. These fire behavior characteristics are significantly enhanced by steep, highly variable slopes and the potential for extreme weather conditions.

There are several small streams draining the foothills near Heart Butte; the North Fork and South Fork of Whitetail Creek being the closest. There is significantly more fuels within these drainages that could support a much more intense wildfire than the native rangelands. As water levels in the creeks drop in late summer, some of these fuels begin to dry out and become available to burn. Homes located near these waterways would be at risk as the fire spread through the stream corridor. Additionally, fires in this type of area are difficult to suppress due to lack of direct access and potential sensitivity of the vegetation and wildlife.

In this part of Montana, lightning is a significant source of ignitions, but vehicle use on and off roads also has the potential to ignite fires. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Cultural burning on the Reservation occurs mostly in the spring. This type of fire is usually relatively small with few occurrences of escaped burns threatening people, structures, or infrastructure.

4.7.3.5.2 Ingress-Egress

The community of Heart Butte is accessed from the north by either Badger Creek Road from U.S. Highway 89 or Heart Butte Road from Browning and from the south by Heart Butte or Birch Creek Road. These are all paved, two lane roads, but there are also several graveled secondary routes crisscrossing the area.

4.7.3.5.3 Infrastructure

Residents within Heart Butte have access to the municipal water system, but homes in the outlying areas rely on personal well systems. Supplementary wells have also been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition. Power poles can, in some instances, add to the fuel complex of a wildfire. The loss of even one pole to fire causes a loss of electricity, which may inhibit the efficiency and effectiveness of emergency response and cause other infrastructure and service components to fail.

4.7.3.5.4 Fire Protection

The Heart Butte Volunteer Fire Department provides structural and wildland fire protection to the community of Heart Butte and the surrounding area.

All fifty-six Montana Counties are currently enrolled in the State/County Cooperative Fire program. According to agreements signed with the state, each county is obligated to fight wildland fire on all state and private ground not covered by an existing fire agency. The Montana Department of Natural Resources and Conservation, in turn, assists counties when fires exceed their capability, provides training in wildland fire fighting, administrative support to county fire agencies through involvement in the County Rural Fire Councils and Fire Protective Associations, as well as the loan of Federal Excess Personal Property (FEPP) fire equipment.

4.7.3.5.5 Community Risk Assessment

Residents of Heart Butte have a moderate to high risk of experiencing a wildland fire due to the presence of native fuels among and adjacent to structural as well as the increased amount of higher risk fuels and topography to the immediate west of the community center. Additionally, ranching and cultural activities somewhat increase the potential for an ignition. It is important that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Only a few homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

Local winds out of the south and southwest could potentially push an uncontrolled wildfire in the Lewis and Clark National Forest toward Heart Butte. The Heart Butte area experiences frequent high winds, which generally increases the rate of fire spread and intensity of fires. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event.

Because there are no fueling stations in Heart Butte, the local fire department must have fuel delivered and stored for use in their equipment. Occasionally, the department does not have enough fuel on hand to respond to more distant fire calls. This puts many residents in the area at extreme risk.

4.7.3.5.6 Mitigation Activities

As with all other communities, constructing a defensible space around homes, businesses, and other structures is one of the most effective ways to protect them from wildfire. In the Heart

Butte area, this will likely include mowing and removing weeds and other vegetation from around structures and moving flammable items such as propane tanks and wood piles a safe distance away. Trees or riparian vegetation can also be thinned or pruned to reduce the likelihood of torching or crowning. Maintaining a clean and green yard around home sites is an effective fire mitigation measure. Additionally, using fire resistant siding, decking, and roofing will help reduce the ignitability of the structure.

Roads can be made more fire resistant by mowing along the edges frequently to reduce the fuels or planting more fire resistant grasses in these highly prone areas. Aggressive initial attack on fires occurring along travel routes will help insure that these ignitions do not spread.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

Local efforts should be made to insure that the Heart Butte Volunteer Fire Department has the appropriate equipment and staffing to respond to fires in their district safely and effectively. The capacity of fuel storage tanks in Heart Butte should be increased to facilitate the department's needs at all times.

4.8 Firefighting Resources and Capabilities

The Firefighting Resources and Capabilities information provided in this section is a summary of information provided by Pondera County Fire Organizations and Representatives of the Wildland Firefighting Agencies listed. Their answers to a variety of questions are summarized here. These summaries indicate their perceptions and information summaries.

4.8.1 Rural and City Fire Protection

4.8.1.1 Pondera County Rural Fire District

P.O. Box 780
Conrad, Montana 59425

District Summary: The Fire District covers most of Pondera County and is comprised of rural departments stationed in Brady, Conrad, Dupuyer, and Valier.

Priority Areas:

Communications: Digital is not an option at this time because of cost and lack of equipment.

Effective Mitigation Strategies: There should be fire breaks around grass areas and CRP fields.

Education and Training: More training for volunteers would be great, but it is expensive and volunteers cannot always take time off work to attend meetings and workshops.

Cooperative Agreements: District has mutual aid agreements with other counties and agencies.

Needs: The Fire District and the four rural departments should be included in any and all firefighting plans and sessions.

Current Resources:

Brady Department

- 1956 Ford 1-ton with a slide on 500 gallon tank & 35 gpm pump @ 200 psi (slide on unit on loan from DNRC)
- 1979 Chevrolet 1 ton 4x4 brush truck with slide on 200 gallon tank and 50 gpm pump @ 150 psi (slide on unit on loan from DNRC)
- 1987 Ford water tender, 1750 gallon tank and 500 gpm pump @ 100 psi
- 2002 GMC pumper truck, 1000 gallon tank & 750 gpm pump @ 165 psi

Conrad Department

- 1975 Ford tandem water tender, 4500 gallon tank & 150 gpm pump @ 115 psi
- 1982 Ford extrication van
- 1984 Chevrolet 4x4 brush truck, 260 gallon tank & 50 gpm pump @ 100 psi
- 1990 GMC pumper truck, 1000 gallon tank & 750 gpm pump @ 150 psi
- 2004 Ford F-550 4x4 brush truck, 400 gallon tank & 200 gpm pump @ 125 psi

Dupuyer Department

- 1967 Ford pumper/tender truck, 1000 gallon tank & 1000 gpm pump @150 psi
- 1971 GMC 4x4 pumper truck, 700 gallon tank & 750 gpm pump @ 200 psi
- 1977 IHC 4x4 tender truck, 500 gallon tank & 34 gpm pump @ 150 psi (on loan from DNRC)
- 1995 Ford 4x4 brush truck, 300 gallon tank & 30 gpm pump @ 300 psi

Valier Department

- 1989 GMC 4x4 brush truck, 250 gallon tank & 200 gpm pump @ 100 psi
- 1995 Freightliner water tender, 3500 gallon tank & 150 gpm @ 115 psi
- 2006 IHC 4x4 pumper truck, 750 gallon tank & 750 gpm @ 150 psi

4.8.1.2 City of Conrad Fire Department

Chief: Kevin Moritz
Phone: 406-278-3123
Address: 15 5th Avenue SW
Conrad, Montana 59425

District Summary: The City of Conrad Fire Department covers any fires inside the city limits of Conrad.

Priority Areas:

Residential Growth: If there is any growth in the population, it would be with the retired age group.

Communications: The Conrad Fire Department has some of the best communication in the area; pagers, portable radios, and mobiles within the city.

Burn Permits: There is no open burning inside the city limits.

Education and Training: Training has been available to our volunteer firefighters; however, the time and place sometimes creates a problem since most volunteers have full time jobs during the day.

Cooperative Agreements: Pondera County Rural fire trucks also respond to city fires.

Current Resources:

- 1956 LaFrance 250 gallon tank, 500 gpm pump

- 1975 LaFrance Ford, 750 gallon tank, 1250 gpm pump
- 1996 Central GMC, 1000 gallon tank, 1000 gpm pump

Future Considerations: Updating the fire trucks. One of the department's pumpers is over 50 years old and another is over 30 years old.

Needs: The department needs one new 1,000 to 1,250 gpm pumper truck with 1,000 gallon capacity, a top mount panel for safety, and a double cab for firefighter safety while putting on SCBA when responding to fire calls.

4.8.1.3 Valier Volunteer Fire Department

Chief: Rod Christiaens
Phone: 406-279-3624

Current Resources:

- 1989 GMC 4x4 brush truck, 250 gallon tank & 200 gpm pump @ 100 psi
- 1995 Freightliner water tender, 3500 gallon tank & 150 gpm @ 115 psi
- 2006 IHC 4x4 pumper truck, 750 gallon tank & 750 gpm @ 150 psi

Department Needs:

The Valier Fire Department is currently in need of 30 pagers, various tools (flappers, shovels, etc.), a 10 horsepower electric pump, and a ¾ ton four door quick response unit.

4.8.1.4 Heart Butte Volunteer Fire Department

Chief: Francis Wild Gun
Phone: 406-338-3151

Department Needs:

The Heart Butte Fire Department is currently in need of a Type 6 pumper truck and an additional slip tank.

4.8.1.5 Dupuyer Volunteer Fire Department

Chief: Kevin Henke
Phone: 406-472-3233

District Summary

U.S. Highway 89, a major traffic arterial, borders the town limits. The department also responds to mutual aid requests from other VFD's and the Blackfeet Indian Reservation. Dupuyer VFD has responsibility of approximately 700 residents and encompasses 216 square miles. There are currently 10 volunteers. The department is averaging about 10 to 15 call outs per year including mutual aid. However, the number of call outs is expected to rise due to the extended drought in north central Montana.

Department Needs

The Dupuyer VFD is currently applying for grant funds in the Operations and Safety Acquisition area. Identified as a result of a risk assessment, the department is requesting the following equipment:

- 1 complete air fill system
- 1 gas powered turbo blower

- 10 structural firefighting helmets
- 9 Motorola XTS 2500 Model II Portable Radios
- 4 Motorola XTL 2500 Mobile Radios
- 1 Motorola T5365 Quantar Repeater

This department has a new fire chief and is in the process of revitalizing the entire department. Currently, Dupuyer VFD has 10 firefighters. The above noted equipment is being requested in an effort to provide more effective service to Dupuyer residents, as well as to provide for the safety of our firefighters. At the present time, when SCBA tanks need refilling, they must be taken to a town approximately 30 miles away. Having equipment within the department will allow SCBAs to be filled in a timelier manner. In addition, if a second call for service were received, there is a high possibility that the department could not respond due to empty tanks. The blower will be used to enhance both firefighter and victim safety.

A grassroots effort in Montana is currently underway to develop a statewide trunked radio system. As part of the developing process, the repeater site in Pondera County is due to be developed in the spring of 2007. In order to fully utilize the system, the department is in need of mobile and portable radios. Additionally, the repeater currently in use needs to be upgraded to digital, trunked, and encryption standards.

Dupuyer VFD has operated with a yearly levy based on collected property tax revenues from fire district residents. This has averaged about $6,000 over the past three years. The money is used to maintain the aging fleet of four vehicles. It also goes towards utility and buildings costs associated with the department. Only through the diligence of department members has this funding been able to support the department and establish a small reserve to go towards upgrading equipment with the anticipated help from grants.

Currently, not all firefighters have access to a radio. Those who do have radios use outdated models passed down from other agencies.

Current Resources:

- 1967 Ford pumper/tender truck, 1000 gallon tank & 1000 gpm pump @150 psi
- 1971 GMC 4x4 pumper truck, 700 gallon tank & 750 gpm pump @ 200 psi
- 1977 IHC 4x4 tender truck, 500 gallon tank & 34 gpm pump @ 150 psi (on loan from DNRC)
- 1995 Ford 4x4 brush truck, 300 gallon tank & 30 gpm pump @ 300 psi

4.8.1.6 Brady Fire Department

Chief: Roy Vanden Bos
Phone: 406-753-2240
Address: P.O. Box 232
Brady, Montana 59416

District Summary: The Brady Fire Department is a rural farming district with interstate and rail lines. Several missile silos and two command centers are within the department's areas of coverage.

Current Resources:

Table 4.16. Current Equipment List for Brady Fire Department.

Year	Make	Model	Tank Capacity	Pump Capacity
1956	Ford	1 ton	500	35 gpm @ 200 psi

Table 4.16. Current Equipment List for Brady Fire Department.				
Year	**Make**	**Model**	**Tank Capacity**	**Pump Capacity**
1979	Chevy	1 ton	200	50 gpm @ 150 psi
1987	Ford	2 ton	1750	500 gpm @ 100 psi
2002	GMC	2 ton	1000	750 gpm @ 165 psi

Future Considerations: In the future, Brady will need to replace both one tons and a tender truck as well as upgrade their radios. Also, the fire hall will need new siding.

4.8.2 Wildland Fire Protection

4.8.2.1 U.S. Forest Service – Lewis & Clark National Forest, Rocky Mountain Ranger District

Chief: Brad McBratney (District Fire Management Officer)
Telephone: (406) 562-3247
e-Mail: bmcbratney@fs.fed.us
Address: PO Box 365
Augusta, MT 59410

District Summary:

The Rocky Mountain Ranger District contains 775,925 acres of National Forest managed by a staff of 16 permanent employees, 35-40 seasonals and many volunteers. We are responsible for managing 300,000 acres of the Bob Marshall Wilderness, 84,407 acres of the Scapegoat Wilderness and 391,518 acres of non-wilderness National Forest land. We are part of the Bob Marshall Wilderness Complex which includes the Bob Marshall, Great Bear and Scapegoat wilderness areas on the Flathead, Lolo and Helena National Forests.

The Rocky Mountain Ranger District is visited by approximately 800,000 people a year. There are 1023 miles of trails, 130 miles of roads, 99 recreation residence permits, 40 grazing permittees, 26 commercial outfitters, 16 trailheads, 11 developed campgrounds, 6 eligible wild/scenic rivers, 4 special use resorts, 3 lookouts, 1 paved airstrip and 1 ski area. The listed resources and areas are spread across 4 counties: Lewis & Clark, Teton, Pondera, and Glacier.

The Rocky Mountain Ranger District has a very active fire management program consisting of Prescribed, Fire Use, and Fire Suppression programs. There is currently one Type 6 engine, 1 Fire Use Module, and a shared Forest Exclusive Use Helicopter program.

Priority Areas:

Residential Growth: *N/A*

Communications: The Rocky Mountain Ranger District recently updated its communication system. It is currently Narrow Banded with Various Repeaters supporting the system. There are 5 radio repeaters located at the following locations: Half Dome, Mt. Wright, Prairie Reef, Renshaw, and Steam Boat. These are all true repeaters making for more effective communications for personnel in the field and back to the local unit or Great Falls Interagency Dispatch Center (GDC).

Basic Administrative traffic is covered by the local unit either in Choteau or Augusta and all Fire Related radio traffic is covered by GDC.

Burn Permit Regulations:

MTDEQ or County required Burning Permits are issued until the fire danger level warrants closing the burning season, or until the fall burning period is over.

The Regional Office and MTDEQ must approve Winter Burning. National Weather Service forecasts must be Good or Excellent Ventilation to burn.

Effective Mitigation Strategies:

The Rocky Mountain Ranger District has various Mitigation Strategies in place or in the planning process. These include, but are not limited to, the following:

- Rocky Mountain Ranger District Fire Prevention Plan
- Rocky Mountain Ranger District E-Plan
- South Fork of the Sun River Rx Burn (Lewis & Clark County)
- Benchmark Hazardous Fuels Reduction Project (Lewis & Clark County)
- Mortimer Gulch Hazardous Fuels Reduction Project (Teton County)

Education and Training:

The Rocky Mountain Ranger District is pro-active in its education and training of its employees and cooperators. The RMRD fire management personnel are engaged in training for a minimum of several weeks every year. This training encompasses the wide range of Fire Management and Safety techniques and procedures. The training is to keep current with the NWCG training and qualification requirements. Forest Service employees shall comply with the FSH 5109.17 Fire and Aviation Management Qualifications Handbook.

Interagency Cooperative Agreements, Plans, and MOUs

The following information is available in the FY 2006 Lewis & Clark National Forest Fire Management Plan Appendix F.

REGIONAL AGREEMENTS

Cooperative Fire Protection Agreement (FS01-98-20-5100) between Montana BLM, USDI; Intermountain Region of the NPS; Portland and Billings Areas of BIA; Prairie Mountain Region of the US Fish and Wildlife Service; Northern Region of the Forest Service, USDA; and the State of Montana DNRC.

The purpose of this Cooperative Fire Protection Agreement (CFPA) is to document the agreements and commitments to fire protection assistance and cooperation made by the signing agencies.

Memorandum of Understanding between the Portland and Billings Area, BIA Offices; Region One, Forest Service, USDA; Montana BLM, USDI; Rocky Mountain Region of the National Park Service, and the Montana Department of State Lands (now the Department of Natural Resources and Conservation), 1983.

This Memorandum of Understanding establishes the general guidelines and procedures for use and dispatch of Montana Indian Firefighters (MIF) for Wildland fire control work as updated in the yearly Operating Plan.

Cooperative Firefighting Agreement between the Montana National Guard and the US Forest Service, Region 1; National Park Service, Rocky Mountain Region; Montana State Director, BLM, and Rocky Mountain Regional Office, Billings BIA.

This agreement allows the Federal Agencies to call the National Guard to help fight forest fires when other resources have been depleted. Discusses dispatch procedures; equipment use, maintenance, restoration and replacement; organization; payment; etc.

Central Montana Zone – Northern Rockies Coordinating Group – Annual Operating Plan June 2006. The major objective is to support interagency cooperation, communication, and coordination and to provide interagency wildland fire management direction and all risk support for the Central Montana Zone

of the Northern Rockies Coordinating Group (NRCG). The Central MT Zone represents a combination of Federal, State, County, and Tribal agencies managed across 11 counties and 31 administrative units. Three geographic divisions are utilized to divide the zone into cooperating groups who are served by a central interagency dispatch center, each division has a Division Operating Plan. A Zone Coordinator and members on NRCG working Committees are positions that Zone members will fill (for two-year terms).

FOREST WIDE AGREEMENTS

Interagency Agreement, between the Lewis & Clark National Forest and Rocky Mountain Region - BIA for the Great Falls Interagency Dispatch Center. This document is intended to guide the resource coordination efforts and cooperation efforts between the Billings BIA Office and the Lewis and Clark Forest in the operation of the Great Falls Interagency Dispatch Center. A major objective is to support the Montana Indian Firefighters (MIF) Operating Plan (and dispatching crews for three northern Montana Indian Tribes) through the Northern Rockies mobilization process. These crews are organized under NRCG to provide NR geographic wildland fire support or for out of Area needs. This document is a supplement to the Northern Rockies Interagency Mobilization Guide.

Great Falls Division – Central MT Zone - NRCG - 2005 Annual Operating Plan between the following Counties: Glacier, Toole, Pondera, Teton and Cascade; Lewistown Office, Bureau of Land Management; Conrad Office, Montana Department of Natural Resources and Conservation; Rocky Mountain Regional Office, Billings BIA, and the Lewis & Clark National Forest.

The purpose of this Operating Plan is to define operating procedures and responsibilities within the framework of the Cooperative Fire Management Agreement (FS 01-98-20-5100), and the Cooperative Fire Control Agreements of the Agencies/Departments listed above. This Operating Plan covers Cooperative Fire, Wildland/Urban Interface, Wildfire Prevention, Wildfire Protection, Interagency Training, and Public Information programs.

This agreement is between the federal, state and local county government and fire departments in those counties with fire protection responsibilities. The Plan is intended to define agency roles and will describe the manner in which these agencies work together to provide safe and cost-effective fire protection for the wildland areas within those counties.

Annual Operating Plan - Great Falls Division - among the Lewis & Clark NF, Great Falls and Helena Division Counties (7), DNRC, BLM, BIA, and FWS.

Master Agreement & Annual Operating Plan between Lewis & Clark NF and Lewistown BLM. Interagency Operating Plan which identifies the exchange of protection responsibilities for scattered portions of BLM lands and the Big and Little Snowy Mountains from the FS as identified on designated maps. The agreement identified fire protection responsibilities to include initial attack, detection and aviation support as provided by Lewistown.

General Agreement & Annual Operating Plan between Glacier National Park, Lewis & Clark NF and Blackfeet Agency BIA. Interagency mutual aid Operating Plan which identifies the parameters for suppression tactics, leadership and communication process between the three agencies. Each agency will take prompt initial action on fires within the boundaries of the other agencies, using the closest available resource regardless which agency has fire protection responsibility. IA resources will communicate with the host Dispatch Center, and the host agency will be notified of the IA action as soon as possible.

Annual Operating Plan between Lewis & Clark NF Judith Ranger District and Chouteau County Fire Districts. This Annual Operating Plan is a working document developed for the purpose of implementing the Cooperative Fire Protection Agreement at the local level. This plan identified fire protection responsibilities for lands, which are adjacent to joint boundaries, and specific for those portions of the Lewis & Clark National Forest, located in Chouteau County, Montana.

Annual Operating Plan between Lewis & Clark NF Judith and Belt Creek Ranger Districts and Judith Basin County Fire Districts. This Annual Operating Plan is a working document developed for the purpose of implementing the Cooperative Fire Protection Agreement at a local level. This plan identified fire protection responsibilities for lands, which are adjacent to joint boundaries, and specific for those portions of the Lewis & Clark National Forest, located in Judith Basin County, Montana.

A complete copy of each of the operating plan agreements listed in this section is on file in the Great Falls Interagency Dispatch Center. Copies of the pertinent agreements will be provided to the Incident Commander (IC) when he/she is assigned.

Financial and Operating Plan to the Cooperative Law Enforcement Agreement between: Glacier, Lewis & Clark, Teton, Cascade, Fergus, Choteau, Judith Basin, Golden Valley, Wheatland, and Meagher Counties and USDA Forest Service, Lewis & Clark National Forest.

Current Resources:

Station #1: Choteau, MT

Table 4.17. USFS Current Equipment List for Choteau, Montana.

Year	Make	Model	Tank Capacity	Pump Capacity
2004	Ford F-550	Model 61 (BME)	314	73 GPM @ 150 P.S.I.**
*2002	Ford F-450	Model 52 (R1 AFD)	300	71 GPM @ 150 P.S.I **

Engine will be staffed with a minimum of 3 personnel (1 ENGB & 2 FFT2's)

* E-611 is an as needed fire engine. When fire danger indices and staffing levels are required the apparatus will be placed into service.

** Pump capacity was tested with a .75" nozzle.

Station #2: Augusta, MT

Table 4.18. USFS Current Equipment List for Augusta, Montana.

Year	Make	Model	Tank Capacity	Pump Capacity
2004	Chevy 2500 HD	Lewis & Clark Fire Use Module	N/A	N/A
2002	Ford Expedition	Lewis & Clark Fire Use Module	N/A	N/A

***** Lewis & Clark Fire Use Module is a 4-8 person module. Their emphasis is Fire Use but they are also Initial Attack Capable.

Future Considerations: N/A

Needs: N/A

4.8.2.2 Montana Department of Natural Resources and Conservation, Central Land Office

Rural Fire Specialist: David Hamilton
Telephone:406-458-3526
e-Mail:dahamilton@mt.gov
Address:8001 N. Montana Ave, Helena, Mt. 59602

District Summary: Central Land Office(CLO) has fourteen counties in their land office. They are Glacier, Toole, Liberty, Pondera, Teton, Cascade, Lewis & Clark, Meagher, Broadwater, Jefferson, Beaverhead, Madison, Park, and Gallatin counties. Some of the counties we have direct protection in while others we support the counties as they need help. We support them with training for wildland fire incidents and also supply support as need for incidents.

Priority Areas:

Fire Fighting Vehicles: 9 type 6 Engine's, 2 Tender's, 1 Helicopter type 2 with access to more, 1 Fixed wing airplane

Burn Permit Regulations: Counties regulate this

Education and Training: Provide wildland training to all of our firefighter's. A few of our employee's are cross training thru their personal lives for all-risk incidents

Cooperative Agreements: Have agreements signed with all the above mentioned counties plus mutual aid agreements signed with them all also.

Current Resources:

Helena Unit:

seven type 6 engines with 300 gallons of water

Dillon Unit:

2 type 6 engines with 300 gallons of water

Future Considerations: all of our aircraft is stationed in Helena and available 12 months out of the year.

4.8.2.3 Bureau of Land Management

Chief: Gary Kirpach
Telephone: (406) 538-1085
e-Mail: gkirpach@mt.blm.gov
Address: PO Box 1160
Lewistown MT 59457

District Summary:

The BLM Central Montana Zone is a Federal wildland fire program with lands in 16 counties in Central and North Central Montana. The BLM fire program is limited to wildland fire actions only and on BLM lands or as requested under agreements.

Priority Areas:

Residential Growth: N/A

Communications: The Central Zone has a dispatch center located in Lewistown. Our resources have the ability to field program radios.

Fire Fighting Vehicles: We have a fleet of 7 engines and other support vehicles.

Burn Permit Regulations: N/A

Other: N/A

Cooperative Agreements:

The Zone has Offset and I.A agreements with the counties that we have had a history of interaction. Our ability to support the counties to the far west of the Zone is limited by distance and the time required responding.

Current Resources:

Station #1: Lewistown

Table 4.19. BLM Current Equipment List for Lewistown.

Year	Make	Model	Tank Capacity	Pump Capacity
99	Ford	F-450	280	100 GPM
99	Ford	F-450	280	100 GPM
99	Ford	F-450	280	100 GPM

Table 4.19. BLM Current Equipment List for Lewistown.				
Year	**Make**	**Model**	**Tank Capacity**	**Pump Capacity**
01	International	4800	860	125 GPM
99	Ford	F-450	280	100 GPM
99	Ford	F-450	280	100 GPM
01	International	4800	860	125 GPM

Future Considerations: Budget

Needs: N/A

4.9 Issues Facing Pondera County Fire Protection

4.9.1 Rocky Boy's North Central Montana Regional Water System

The Chippewa Cree Tribe of the Rocky Boy's Reservation and the State of Montana, through the Reserved Water Right Commission, negotiated a settlement of the Tribe's Water Rights Claims. The Compact, ratified by the 1997 Montana Legislature and signed by President Clinton in December of 1999, provided a water allocation to the Tribe from the Lake Elwell, also known as Tiber Reservoir, south of Chester.

The importation of this water to the Rocky Boy's Reservation will involve the construction of a treatment plant, intake structure and approximately 50 miles of pipeline from Tiber Reservoir to the Reservation. Construction of the water treatment plant at Tiber Reservoir is intended to maximize the potential service area.

The system is comprised of a Core and Non-core systems. The Core system is the intake, reservoirs, treatment plant, pumping plants and transmission pipeline from Lake Elwell to the communities within the Rocky Boy's Reservation.

The Non-core system is the storage, pumping and pipeline facilities from the Core System to the Participating System, which include Town of Big Sandy, City of Conrad, City of Cut Bank, Town of Dutton, Galata County Water District, North Havre County Water District, Sweetgrass Community Water & Sewer District, Oilmont County Water District, Sage Creek Water District, City of Shelby, Town of Sunburst, Tiber County Water District, Devon Water Users Association and South Chester County Water District.

The goals of the Regional Water System are to ensure a safe and adequate rural, municipal, and industrial water supply for residents of the Rocky Boy's Reservation; and assist the citizens residing in Chouteau, Hill, Liberty, Pondera, Teton, Glacier and Toole Counties, but outside of the Reservation, in developing a safe and adequate rural, municipal, and industrial water supply.

The planning committee involved in the development of this Community Wildfire Mitigation Plan has recognized the Rocky Boy's Regional Water System as a potential asset to the continued improvement of firefighting capabilities in Pondera County. It is the recommendation of this plan that the appropriate Pondera County and City of Conrad officials begin making formal requests for the inclusion of hydrants at intersections of the Rocky Boy's main water lines and primary and secondary access routes within the county to provide additional water access for firefighting purposes. It is the belief of this planning committee that the strategic placement of water hydrants during the original construction of the water system will be more cost efficient than post-construction improvements.

4.9.2 Augmentation of Emergency Water Supplies

In many rural areas of Pondera County, there are no readily accessible, year-round water resources available for use by local fire departments. Thus, it is necessary for firefighters to keep large amounts of water loaded on trucks at all times. In the event of a large fire situation, additional water supplies must be transported to the site. The Pondera County fire departments feel that establishing permanent augmentations to emergency water supplies is necessary throughout the County. This includes establishment of dry hydrants and drafting sites where immediate access to water is limited. Retrofitting dependable, year-round irrigation water sources with necessary fittings for use by emergency response equipment would also be highly beneficial. Once developed, these water sources need to be mapped and use agreements need to be made between landowners, local fire departments, the Montana Department of Natural Resources and Conservation, U.S. Forest Service, Bureau of Indian Affairs, and the Bureau of Land Management.

4.9.3 Recruitment and Retention, Funding, Equipment Needs, Etc.

There are a number of pervasive issues that challenge volunteer districts within Pondera County. A short list of such issues include recruitment and retention of volunteers, lack of funding for equipment needs, keeping pace with increases in training requirements, as well as numerous other factors that test district's abilities. The members of all fire protection districts should be recognized for the dedication they have shown and the excellent level of protection they provide for residents throughout the county. Volunteers take time out of their lives every day in order to assure the safety of the community.

The demands on volunteer departments are considerable. Keeping pace with ever-increasing training requirements can lead to burn-out of volunteers who are scantly compensated for their time and efforts. Keeping pace with the growing needs of the communities the districts serve is a constant challenge as well. Although there are many potential funding sources available for local districts to acquire equipment and other needs, grant writing and chasing of funding sources takes considerable time and effort. Recommendations that can help to reduce these challenges will be presented in Chapter 5.

4.9.4 Missile Silos

There are 200 Air Force missile silos scattered across 23,000 square miles of central Montana with approximately 50 sites located in Pondera County. Men and women of the 341st Space Wing based at Malmstrom Air Force Base outside of Great Falls maintain the Intercontinental Ballistic Missiles.

Roughly 55 "missileers" of the 341st Space Wing are broken into four district squadrons. Each squadron is responsible for 50 missiles. These squadrons are each separated into five crews. Each crew controls ten missiles. The Minuteman III missiles they control are more than just weapons; each one is fitted with a nuclear warhead capable of doing long-term large-scale damage to entire ecosystems. Each crew, responsible for ten launch sites, lives in a Launch Control Facility (LCF). An LCF is partially buried below ground. Above ground are the areas where missileers live and eat. Below ground are the more secured areas.

The missile silos present a unique challenge to wildland firefighting. Currently, local fire departments are not allowed to enter the missile sites; however, they do provide wildland fire protection on the surrounding grounds. Due to the heightened security at the sites, fire and other emergency response crews must be very careful not to approach the sites with either crew staff or equipment. This presents a considerable problem for fire departments. Not only is there

some confusion about how they should go about fighting fires near the sites, but responding to these areas may also put firefighters in danger.

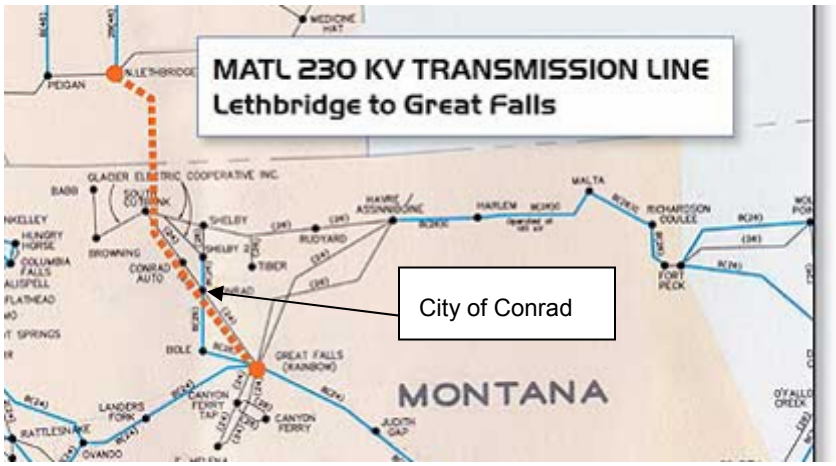
The general procedure fire departments should follow when responding to a fire within, near, or threatening a missile site is:

1. 911 dispatches appropriate department and calls Malmstrom Air Force Base at 406-731-3746 with specific information on the type of fire and its location. The security detail at the missile facility will be notified. Direct communication can then be set up between the responding department and missile facility security personnel.
2. If the fire is located within the launch facility hole, fire departments should begin evacuating the area within 6,000 feet of the site.
3. In the case of wildfires in the surrounding area, departments should suppress the fire to the best of their ability while staying in constant communication with security personnel at the missile site. Fire crews **should not** attempt to approach the security antenna at the missile site.
4. Malmstrom Air Force Base offers annual training seminars regarding local fire response to the missile facilities.

4.9.5 Montana Alberta Tie

Montana Alberta Tie Limited ("MATL") is proposing to construct a new privately funded or "Merchant" transmission line between Lethbridge, Alberta and Great Falls, Montana - the first direct power transmission inter-connection between Montana and Alberta. This new transmission line will be a 326 km/203 mile, 230 kV AC line, complete with a phase shifting transformer and up to 300 MW of transfer capacity. The line will be a synchronous interconnection and will enhance the overall system reliability of the electric systems in both Montana and Alberta.

Figure 4.3. Montana Alberta Tie Proposed Route Map.



Pondera County Fire Departments currently receive specialized training to deal with power line issues. Additional training may be needed for firefighters to safely protect the Montana Alberta Tie.

4.9.6 Valier – Conrad Fire Department Boundaries

A large acreage bounded by Interstate 15, State Route 44, and Lone Tree Lane (partial) in northern Pondera County is currently within the boundaries of the Conrad Volunteer Fire Department. Due to its location, firefighters from the Valier Volunteer Fire Department typically are able to respond more rapidly than the Conrad Department. Thus, the Valier Volunteer Fire Department would like to see this area annexed into the Valier Department's jurisdiction in order that they could receive credit for calls to this area.

4.9.7 Oil and Gas Extraction and Pipelines

There are numerous oil rigs scattered throughout Pondera County. New technology and mechanical improvements on these rigs has reduced the fire danger significantly; however, these sites are still at risk from wildland fires and are also prone to lightning strikes.

The main oil and gas pipeline enters the U.S. near the Piegan Port of Entry and heads south passing through Cut Bank, Conrad, and Brady on its route. Not only do these pipelines introduce an inherent risk to the environment, but they can also be a significant fire danger, particularly as they pass through or nearby communities.

The local fire departments currently receive training on how to deal with fires associated with the oil and gas infrastructure in the County; however, these sites remain a significant risk factor.

4.9.8 Burlington Northern Railroad

Approximately 25% of the structures within the City of Conrad are located on the wedge of land between Interstate 15 and the Burlington Northern Railroad right-of-way. Not only are these structures at increased risk of wildfires originating from either the railroad and the Interstate, but access to this area can be blocked for a significant amount of time during the train passage. There are currently no overpasses crossing the tracks that would allow fire department or emergency service access at times when the train is present. There is also no direct route to access this area from the Interstate side.

4.9.9 Fires in Conservation Reserve Program Fields

Since the introduction of the Conservation Reserve Program by the federal government, many formerly crop producing fields have been allowed to return to native grasses. Conservation Reserve Program fields are creating a new fire concern all over the west. As thick grasses are allowed to grow naturally year after year, dense mats of dead plant material begin to buildup. Due to the availability of a continuous fuel bed, fires in CRP fields tend to burn very intensely with large flame lengths that often times jump roads or other barriers, particularly under the influence of wind. Many landowners and fire personnel are researching allowable management techniques to deal with this increasing problem. Currently, according to the CRP Handbook all management must be part of the landowner's Conservation Plan of Operations, which includes burning to reduce the fuel loading, and must be in the best interest of the CRP. Under certain circumstances, burning may be used as a process to enhance or renovate the existing vegetative cover for wildlife, especially if it is overgrown and stagnant. As noted in Montana CRP-542, burning can only be conducted under an approved burn plan by qualified personnel. The County must also issue a burn permit for any controlled burning on CRP fields. A map of the projected Conservation Reserve Program acres in Pondera County is included in Appendix I.

Chapter 5: Treatment Recommendations

5 Administration & Implementation Strategy

Critical to the implementation of this Community Wildfire Protection Plan will be the identification of, and implementation of, an integrated schedule of treatments targeted at achieving an elimination of the lives lost, reduction in structures destroyed, infrastructure compromised, and unique ecosystems damaged that serve to sustain the way-of-life and economy of Pondera County and the region. Since there are many land management agencies and thousands of private landowners in Pondera County, it is reasonable to expect that differing schedules of adoption will be made and varying degrees of compliance will be observed across all ownerships.

Pondera County encourages the philosophy of instilling disaster resistance in normal day-to-day operations. By implementing plan activities through existing programs and resources, the cost of mitigation is often a small portion of the overall cost of a project's design or program.

The federal land management agencies in Pondera County, specifically Bureau of Land Management, U.S. Forest Service, and the Bureau of Indian Affairs, are participants in this planning process and have contributed to its development. Where available, their schedule of land treatments have been considered in this planning process to better facilitate a correlation between their identified planning efforts and the efforts of Pondera County.

All risk assessments were made based on the conditions existing during 2006, thus, the recommendations in this section have been made in light of those conditions. However, the components of risk and the preparedness of the county's resources are not static. It will be necessary to fine-tune this plan's recommendations annually to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

As part of the Policy of Pondera County in relation to this planning document, the Community Wildfire Protection Plan should be reviewed annually at a special meeting of the Pondera County Commissioners, open to the public and involving all municipalities/jurisdictions, where action items, priorities, budgets, and modifications can be made or confirmed. A written review of the plan should be prepared (or arranged) by the Chairman of the County Commissioners, detailing plans for the year's activities, and made available to the general public ahead of the meeting (in accord with the Montana Open Public Meeting Laws). Amendments to the plan should be detailed at this meeting, documented, and attached to the formal plan as an amendment to the Community Wildfire Protection Plan. Total re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every 5-year period following.

5.1 Prioritization of Mitigation Activities

Prioritization of projects will occur at the County, City, agency, and private levels. Differing prioritization processes will occur, however, the county and cities will adopt the following prioritization process, as indicated through the adoption of this plan by each municipality.

The prioritization process will include a special emphasis on cost-benefit analysis review. The process will reflect that a key component in any funding decision is a determination that the project will provide an equivalent or more in benefits over the life of the project when compared with the costs. Projects will be administered by county and local jurisdictions with overall coordination provided by the County Emergency Manager.

County Commissioners and the elected officials of all jurisdictions will evaluate opportunities and establish their own unique priorities to accomplish mitigation activities where existing funds, staffing, and resources are available and there is community interest in implementing mitigation measures. If no federal funding is used in these situations, the prioritization process may be less formal. Often the types of projects that the County can afford to do on their own are in relation to improved codes and standards, department planning and preparedness, and education. These types of projects may not meet the traditional project model, selection criteria, and benefit-cost model. The County will consider all pre-disaster mitigation proposals brought before the County Commissioners by department heads, city officials, fire districts and local civic groups.

When federal or state funding is available for hazard mitigation, there are usually requirements that establish a rigorous benefit-cost analysis as a guiding criterion in establishing project priorities. The county will understand the basic federal grant program criteria which will drive the identification, selection, and funding of the most competitive and worthy mitigation projects. FEMA's two grant programs (the post-disaster Hazard Mitigation Grant Program and Pre-Disaster Mitigation grant programs) that offer federal mitigation funding to state and local governments all include the benefit-cost and repetitive loss selection criteria.

The prioritization of new projects and deletion of completed projects will occur annually and be facilitated by the County Disaster and Emergency Services Coordinator to include the County Commissioner's Office, City Mayors and Councils, Fire District Chiefs and Commissioners, agency representatives (BLM, USFS, DNRC, BIA, etc.), and other community organizations. All mitigation activities, recommendations, and action items mentioned in this document are dependent on available funding and staffing. The prioritization of projects will be based on the selection of projects which create a balanced approach to pre-disaster mitigation which recognizes the hierarchy of treating in order (highest first):

- People
- Infrastructure
- Local and Regional Economy
- Traditional Way of Life
- Ecosystems

5.1.1 Prioritization Scheme

A numerical scoring system is used to prioritize projects. This prioritization serves as a guide for the county when developing mitigation activities. This project prioritization scheme has been designed to rank projects on a case by case basis. In many cases, a very good project in a lower priority category could outrank a mediocre project in a higher priority. The county mitigation program does not want to restrict funding to only those projects that meet the high priorities because what may be a high priority for a specific community may not be a high priority at the county level. Regardless, the project may be just what the community needs to mitigate disaster. The flexibility to fund a variety of diverse projects based on varying reasons and criteria is a necessity for a functional mitigation program at the County and community level.

To implement this case by case concept, a more detailed process for evaluating and prioritizing projects has been developed. Any type of project, whether county or site specific, will be prioritized in this more formal manner.

To prioritize projects, a general scoring system has been developed. This prioritization scheme has been used in statewide all hazard mitigations plans. These factors range from cost-benefit ratios, to details on the hazard being mitigated, to environmental impacts.

Since planning projects are somewhat different than non-planning projects when it comes to reviewing them, different criteria will be considered, depending on the type of project.

The factors for the non-planning projects include:

- Benefit / Cost
- Population Benefit
- Property Benefit
- Economic Benefit
- Project Feasibility (environmentally, politically, socially)
- Hazard Magnitude/Frequency
- Potential for repetitive loss reduction
- Potential to mitigate hazards to future development
- Potential project effectiveness and sustainability

The factors for the planning projects include:

- Benefit / Cost
- Vulnerability of the community or communities
- Potential for repetitive loss reduction
- Potential to mitigate hazards to future development

Since some factors are considered more critical than others, two ranking scales have been developed. A scale of 1-10, 10 being the best, has been used for cost, population benefit, property benefit, economic benefit, and vulnerability of the community. Project feasibility, hazard magnitude/frequency, potential for repetitive loss reduction, potential to mitigate hazards to future development, and potential project effectiveness and sustainability are all rated on a 1-5 scale, with 5 being the best. The highest possible score for a non-planning project is 65 and for a planning project is 30.

The guidelines for each category are as follows:

5.1.1.1 Benefit / Cost

The analysis process will include summaries as appropriate for each project, but will include benefit / cost analysis results. Projects with a negative benefit / cost analysis result will be ranked as a 0. Projects with a positive Benefit / Cost analysis will receive a score equal to the projects Benefit / Cost Analysis results divided by 25. Therefore a project with a BC ratio of 175:1 would receive 5 points, a project with a BC ratio of 250:1 (or higher) would receive the maximum points of 10.

FEMA Requirement §201.4(c)(4)(iii) details criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include consideration for communities with the highest risks, repetitive loss properties, and most intense development pressures. Further, the requirement states that for non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a benefit / cost review of proposed projects and their associated costs. For many of the initiatives identified in this plan, the County may seek financial assistance under FEMA's HMGP or PDM programs. Both of these programs require detailed benefit / cost analysis as part of the FEMA award process. Pondera County is committed to implementing mitigation strategies with benefits which exceed costs. For projects which do not require financial assistance from grant programs that require this type of analysis, the County reserves the right to define "benefits" according to parameters with would otherwise be considered subjective, while still meeting the needs and goals of the plan.

5.1.1.2 Population Benefit

Population Benefit relates to the ability of the project to prevent the loss of life or injuries. A ranking of 10 has the potential to impact 90% or more of the people in the municipality (county, city, or district). A ranking of 5 has the potential to impact 50% of the people, and a ranking of 1 will not impact the population. The calculated score will be the percent of the population impacted positively multiplied by 10. In some cases, a project may not directly provide population benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects the population, but should not be considered to have no population benefit.

5.1.1.3 Property Benefit

Property Benefit relates to the prevention of physical losses to structures, infrastructure, and personal property. These losses can be attributed to potential dollar losses. Similar to cost, a ranking of 10 has the potential to save $10,000,000 or more in losses. Property benefit of less than $10,000,000 will receive a score of the benefit divided by $10,000,000, times 10 (for property benefits below $10 million). Therefore, a property benefit of $2,000,000 would receive a score of 2 ([2,000,000÷10,000,000] x 10 = 2). In some cases, a project may not directly provide property benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects property, but should not be considered to have no property benefit.

5.1.1.4 Economic Benefit

Economic Benefit is related to the savings from mitigation to the economy. This benefit includes reduction of losses in revenues, jobs, and facility shut downs. Since this benefit can be difficult to evaluate, a ranking of 10 would prevent a total economic collapse, a ranking of 5 could prevent losses to about half the economy, and a ranking of 1 would not prevent any economic losses. In some cases, a project may not directly provide economic benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly affects the economy, but should not be considered to have no economic benefit.

5.1.1.5 Vulnerability of the Community

For planning projects, the vulnerability of the community is considered. A community that has a high vulnerability with respect to other jurisdictions to the hazard or hazards being studied or planned for will receive a higher score. To promote planning participation by the smaller or less vulnerable communities in the state, the score will be based on the other communities being considered for planning grants. A community that is the most vulnerable will receive a score of 10, and one that is the least, a score of 1.

5.1.1.6 Project Feasibility (Environmentally, Politically & Socially)

Project Feasibility relates to the likelihood that such a project could be completed. Projects with low feasibility would include projects with significant environmental concerns or public opposition. A project with high feasibility has public and political support without environmental concerns. Those projects with very high feasibility would receive a ranking of 5 and those with very low would receive a ranking of 1.

5.1.1.7 Hazard Magnitude/Frequency

The Hazard Magnitude/Frequency rating is a combination of the recurrence period and magnitude of a hazard. The severity of the hazard being mitigated and the frequency of that event must both be considered. For example, a project mitigating a 10-year event that causes significant damage would receive a higher rating than one that mitigates a 500-year event that causes minimal damage. For a ranking of 5, the project mitigates a high frequency, high magnitude event. A 1 ranking is for a low frequency, low magnitude event. Note that only the damages being mitigated should be considered here, not the entire losses from that event.

5.1.1.8 Potential for repetitive loss reduction

Those projects that mitigate repetitive losses receive priority consideration here. Common sense dictates that losses that occur frequently will continue to do so until the hazard is mitigated. Projects that will reduce losses that have occurred more than three times receive a rating of 5. Those that do not address repetitive losses receive a rating of 1.

5.1.1.9 Potential to mitigate hazards to future development

Proposed actions that can have a direct impact on the vulnerability of future development are given additional consideration. If hazards can be mitigated on the onset of the development, the county will be less vulnerable in the future. Projects that will have a significant effect on all future development receive a rating of 5. Those that do not affect development should receive a rating of 1.

5.1.1.10 Potential project effectiveness and sustainability

Two important aspects of all projects are effectiveness and sustainability. For a project to be worthwhile, it needs to be effective and actually mitigate the hazard. A project that is questionable in its effectiveness will score lower in this category. Sustainability is the ability for the project to be maintained. Can the project sustain itself after grant funding is spent? Is maintenance required? If so, are or will the resources be in place to maintain the project. An action that is highly effective and sustainable will receive a ranking of 5. A project with effectiveness that is highly questionable and not easily sustained should receive a ranking of 1.

5.1.1.11 Final ranking

Upon ranking a project in each of these categories, a total score can be derived by adding together each of the scores. The project can then be ranking high, medium, or low based on the thresholds of:

Project Ranking Priority Score Non-Planning Projects

- High 40-65
- Medium 25-39
- Low 9-24

Project Ranking Priority Score Planning Projects

- High 18-30
- Medium 12-17
- Low 1-11

5.2 Possible Fire Mitigation Activities

As part of the implementation of fire mitigation activities in Pondera County, a variety of management tools may be used. Management tools include but are not limited to the following:

- Homeowner and landowner education
- Policy changes for structures and infrastructure in the WUI
- Home site defensible zone through fuels modification
- Community defensible zone fuels alteration
- Access improvements
- Access creation
- Emergency response enhancements (training, equipment, locating new fire stations, new fire departments, merging existing departments)
- Regional land management recommendations for private, state, and federal landowners

Maintaining private property rights will continue to be one of the guiding principles of this plan's implementation. Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public benefit will be an important component of decisions.

5.3 WUI Safety & Policy

Wildfire mitigation efforts must be supported by a set of policies and regulations at the county level that maintain a solid foundation for safety and consistency. The recommendations enumerated here serve that purpose. Because these items are regulatory in nature, they will not necessarily be accompanied by cost estimates. These recommendations are policy related and therefore are recommendations to the appropriate elected officials; debate and formulation of alternatives will serve to make these recommendations suitable and appropriate.

Table 5.1. WUI Action Items in Safety and Policy.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.1.a: Develop County policy concerning building materials used in high-risk WUI areas on existing structures and new construction.	**Protection of people and structures** by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas. Priority: High	Pondera County Commissioners, Pondera County Planning Department, and the Pondera County Fire District.	Year 1 (2007): Consider and develop policy to address construction materials for homes and businesses located in high wildfire risk areas. Specifically, a County policy concerning wooden roofing materials and flammable siding, especially where juxtaposed near heavy wildland fuels.

Table 5.1. WUI Action Items in Safety and Policy.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.1.b: Begin distributing "Code of the New West"-type pamphlets with building permit requests.	**Protection of people and structures** by improving the overall knowledge of wildfire risk throughout the county. Priority: Medium	Pondera County Commissioners, County Planning Department, City of Conrad, and Town of Valier.	Year 1 (2007): Obtain copyrights to "New Code of the West" pamphlet. Year 1 (2007): Distribute pamphlets.
5.1.c: Develop a policy to enforce burning permits and fire restrictions throughout the county.	**Protection of people and structures** by reducing the fire ignition risk in high-risk areas. Priority: High	County Commissioners, City, County Planning Department, Pondera County Sheriff's Office, City of Conrad, and Town of Valier.	Year 1 (2007): Consider and develop policy to address burn permit system and enforcement to help reduce the number of accidental wildfire ignitions.
5.1.d: Develop policy on adoption of International Fire Code.	**Protection of people and structures** by improving the ability of emergency services personnel to safely and effectively respond to home fires. Priority: High	City of Conrad, Town of Valier, and the Pondera County Fire District.	Year 1 (2007): Consider and develop policy to adopt the International Fire Code regulations adopted by the State of Montana.
5.1.e: Begin making formal requests to Rocky Boy's North Central Montana Regional Water System planning board to include hydrants at strategic points along the main water line.	**Protection of people and structures** by improving water access for firefighting. Priority: High	Pondera County Commissioners, County Emergency Manager, the Pondera County Fire District, and City of Conrad.	Year 1 (2007): Contact the planning board and propose hydrants. Help planning board with cost assessments and research funding options. Ongoing: Actively participate on planning board to insure inclusion of hydrants during construction of the water system.
5.1.f: Adopt stringent regulations to insure fire-safe development of rural subdivisions (see FIREWISE or similar programs for specific recommendations).	**Protection of people and structures** by improving the ability of emergency services personnel to safely and effectively respond to home fires and decrease the overall fire risk in wildland urban interface areas. Priority: High	Pondera County Commissioners, Pondera County Planning Department, the Pondera County Fire District, developers, and interested residents.	Year 1 (2007): Research fire-safety related programs such as FIREWISE to determine specific recommendations for policy changes regarding development of rural subdivisions. Year 2 – 3 (2008 – 2009): Begin gathering public support of new regulations. Produce and submit necessary documentation to facilitate county adoption of recommended regulations.

5.4 People and Structures

The protection of people and structures will be tied together closely as the loss of life in the event of a wildland fire is generally linked to a person who could not, or did not, flee a structure threatened by a wildfire. The other incident is a firefighter who suffers the loss of life during the combating of a fire. Many of the recommendations in this section will define a set of criteria for implementation while others will be rather specific in extent and application.

Many of the recommendations in this section involve education to increase awareness and teach mitigation strategies to the residents of Pondera County. These recommendations stem from a variety of factors including items that became obvious during the analysis of the public surveys, discussions during public meetings, and observations about choices made by residents living in the Wildland-Urban Interface. Unlike many other counties across the west, Pondera County residents demonstrated a higher awareness of wildfire risk factors such as the responses to the homeowner survey questions concerning home risk factors. The results of that survey pointed to a recognition of risk very similar to what "fire professionals" estimated in the county. However, while the risk was recognized, it was still documented, giving specialists the opportunity to concentrate efforts on conveying methods of reducing risk instead of just learning how to identify it.

- Homeowners in the public mail survey ranked their home site wildfire risk factors very similar to the results of a random sample of home rankings completed by fire mitigation specialists.
- Discussions with the general public indicated an awareness of wildland fire risk, but they could not specifically identify risk factors.
- About half (47%) of the respondents to the public mail survey indicated that they want to participate in educational opportunities focused on the WUI and what they can do to increase their home's chances of surviving a wildfire.

In addition to those items enumerated in Table 5.1, residents and policy makers of Pondera County should recognize certain factors, that in their absence, would lead to an increase in the risk factors associated with wildland fires in the WUI of Pondera County. These items listed below should be encouraged, acknowledged, and recognized for their contributions to the reduction of wildland fire risks:

- **Livestock Grazing** in and around the communities of Pondera County has led to a reduction of many of the fine fuels that would have been found in and around the communities and in the wildlands of Pondera County. Domestic livestock not only eat these grasses, forbs, and shrubs, but also trample certain fuels to the ground where decomposition rates may increase. Livestock ranchers tend their stock, placing resource professionals where they may observe ignitions or potentially risky activities. There are ample opportunities throughout the County to increase grazing. This could contribute to the economic output of the county as well as reduce the fuel loading. Livestock grazing in this region should be encouraged into the future as a low cost, positive tool of wildfire mitigation in the wildland-urban interface.
- **Forest Health** in Pondera County has not been affected greatly by the reduction of operating sawmills in the region. However, whenever possible, land managers on the Lewis and Clark National Forest, take advantage of opportunities in reduce hazardous fuels in Pondera County. In addition, forest resource professionals managing forest lands are generally trained in wildfire protection and recognize risk factors when they occur.

- **Agriculture** is a significant component of Pondera County's economy. The original conversion of these lands to agriculture from rangeland, was targeted at the most productive soils and juxtaposition to infrastructure. Many of these productive ecosystems were consequently also at some of the highest risk to wildland fires because biomass accumulations increased in these productive landscapes. The result today, is that much of the rangeland historically prone to frequent fires, has been converted to agriculture, which is at a much lower risk than prior to its conversion. The preservation of a viable agricultural economy in Pondera County is integral to the continued management of wildfire risk in this region.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.a: Implementation of Youth and Adult Wildfire Educational Programs.	**Protect people and structures** by increasing awareness of WUI risks, how to recognize risk factors, and how to modify those factors to reduce risk. Priority: High	Cooperative effort including: • Montana Department of Natural Resources and Conservation • State and Private Forestry Offices • Bureau of Land Management • Bureau of Indian Affairs • MSU Extension • U.S. Forest Service • Local School Districts • Local Non-governmental Community Organizations • Local Fire Departments in Pondera County • City of Conrad, Town of Valier, and communities in Pondera County	To start immediately using existing educational program materials and staffing. Formal needs assessment should be the responsibility of MSU Extension and include the development of an integrated WUI educational series by year 2 (2008). Costs initially to be funded through existing budgets for these activities to be followed with grant monies to continue the programs as identified in the formal needs assessment.
5.2.b: Develop County supported program for the restoration of dead or dying shelterbelts.	**Protect people and structures** by increasing awareness of funding options, available equipment, and the need for restoration of shelterbelts to help reduce wildfire risk. Priority: High	County Commissioners in cooperation with County Disaster and Emergency Services Coordinator, the Pondera County Fire District, BLM, DNRC, USFS, BIA, MSU Extension, and local landowners.	Year 1 (2007): Research potential funding options and apply for grants, cost share, or other programs. Research available contractors and equipment in the local area. Year 2 (2008): Begin public awareness campaign to educate landowners of the potential wildfire risk associated with dead and dying shelterbelts and provide guidance on how to alleviate this risk.
5.2.c: Wildfire risk assessments of homes in high risk areas.	**Protect people and structures** by increasing awareness of specific risk factors of individual home sites in the at-risk landscapes. Only after these are completed can home site treatments follow. Priority: High	To be implemented by County Commissioners in cooperation with wildland fire protection specialists, DNRC, BLM, BIA, USFS, City of Conrad, Town of Valier, local communities, and the Pondera County Fire District. Actual work may be completed by Wildfire Mitigation Consultants.	Cost: Approximately $100 per home site for inspection, written report, and discussions with the homeowners. There are approximately XXX parcels in Pondera County, roughly XXX (20%) of these structures would benefit from a home site inspection and budget determination for a total estimate of $XXX. Action Item: Secure funding and contract to complete the inspections during years 1 & 2 (2007-08) Home site inspection reports and estimated budget for each home site's treatments will be a requirement to receive funding for treatments through grants.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.d: Home site WUI Treatments.	**Protect people, structures, and increase firefighter safety** by reducing the risk factors surrounding homes in the WUI of Pondera County. Priority: Medium	County Commissioners in cooperation with local homeowners, City of Conrad, Town of Valier, local communities, the Pondera County Fire District, DNRC, USFS, BIA, and BLM. *Complete concurrently with 5.2.c.*	Actual cost level will be based on the outcomes of the home site assessments. Estimate that treatments in rangelands will cost approximately $750 per home site for a defensible space of roughly 150'. Approximately XXX home site treatments (75% of those assessed) throughout the County would add up to an estimated cost of $XXX. Home site treatments can begin with the securing of funding for the treatments and immediate implementation in 2007 and will continue from year 1 through 5 (2011).
5.2.e: Community Defensible Zone WUI Treatments.	**Protect people, structures, and increase firefighter safety** by reducing the risk factors surrounding high risk communities in the WUI of Pondera County. Priority: Medium	County Commissioners in cooperation with the Pondera County Fire District, DNRC, USFS, BIA, and the BLM to identify funding availability and project implementation opportunities.	Actual funding level will be based on the outcomes of the home site assessments and cost estimates. Years 2-5 (2008-11): Treat high risk wildland fuels from home site defensible space treatments to an area extending 400 feet to 750 feet beyond home defensible spaces, where steep slopes and high accumulations of risky fuels exist near homes and infrastructure. Should link together home treatment areas. Treatments target high risk concentrations of fuels and not 100% of the area identified. To be completed only after or during the creation of home defensible spaces have been implemented. Approximate average cost on a per parcel basis is $XXX (average 4 acres per home) depending on extent of home defensibility site treatments, estimate XXX homes (50% of treated homes) in need of this type of treatment for a cost estimate of $XXX.
5.2.f: Maintenance of Home site WUI Treatments.	**Protect people, structures, and increase firefighter safety** by reducing the risk factors surrounding homes in the WUI of Pondera County. Priority: Medium	County Commissioners in cooperation with local homeowners, City of Conrad, Town of Valier, local communities, the Pondera County Fire District, DNRC, USFS, BIA, and BLM.	Home site defensibility treatments must be maintained periodically to sustain benefits of the initial treatments. Each site should be assessed 5 years following initial treatment Estimated re-inspection cost will be $100 per home site on all sites initially treated or recommended for future inspections ($XXX). Follow-up inspection reports with treatments as recommended years 5 through 10 (2011-2016).

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.g: Re-entry of Home site WUI Treatments.	**Protect people, structures, and increase firefighter safety** by reducing the risk factors surrounding homes in the WUI of Pondera County. Priority: Medium	County Commissioners in cooperation with local homeowners, City of Conrad, Town of Valier, local communities, the Pondera County Fire District, DNRC, USFS, BIA, and BLM.	Re-entry treatments will be needed periodically to maintain the benefits of the initial WUI home treatments. Each re-entry schedule should be based on the initial inspection report recommendations, observations, and changes in local conditions. Generally occurs every 5-10 years.
5.2.h: Conduct demolition, cleanup, and fuels mitigation project around abandoned home sites in the Ledger area.	**Protect people, structures, and firefighter safety** by decreasing the ignition and fuels risk around homes in the Ledger area. Priority: Low	County Commissioners in cooperation with Ledger area landowners and the Pondera County Fire District.	Year 1 (2007): Contact affected landowners and establish a project plan. Demolition of abandoned structures and subsequent fuels mitigation projects may be an opportunity to provide "real life" training for firefighters. Year 2 (2008): Research funding opportunities if needed and implement the project plan.
5.2.i: Implement a home and community defensible space project for the community and residents of Heart Butte.	**Protect people, structures, community, and firefighter safety in Heart Butte** by decreasing the ignition and fuels risk. Priority: Medium	Bureau of Indian Affairs, Blackfeet Indian Reservation, community of Heart Butte, Pondera County Commissioners, Pondera County Fire District, and local residents.	Year 1 (2007): Locate funding sources and conduct home site evaluations for structures in mapped Heart Butte project area. Write project plans for individual landowners and the community. Year 2 (2008): Continue to work with homeowners to implement agreed upon home defensible space project plans. Years 2-5 (2008-11): Treat high risk wildland fuels from home site defensible space treatments to an area extending beyond home defensible spaces, where high accumulations of risky fuels exist near homes and infrastructure. Should link together home treatment areas. Treatments target high risk concentrations of fuels and not 100% of the area identified. To be completed only after or during the creation of home defensible spaces have been implemented.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.j: Educate landowners on the west and southwest edge of Conrad about the potential wildland fire risk to the town associated with burning activities or wildland fire on their property (e.g. Mink Ranch and Linda Walker property).	**Protect people, structures, community, and firefighter safety in Conrad** by decreasing the ignition and fuels risk. Priority: High	City of Conrad, the Pondera County Fire District, and area landowners.	Year 1 (2007): Contact landowners surrounding Conrad, particularly to the west and southwest, and provide one-on-one wildland fire education. Also, set up fuels reduction projects that will help protect Conrad from oncoming wildfires on willing landowners property.
5.2.k: Implement riparian zone restoration and fuels reduction projects on stream corridors near populated areas (e.g. Dupuyer Creek, Birch Creek, North and South Forks Whitetail Creek, Sheep Creek, and Dry Fork of Marias River).	**Protect people, structures, communities, and firefighter safety** by decreasing the ignition risk and potential spread capability associated with fires in riparian areas. Priority: Medium	County Commissioners, Pondera Conservation District, DNRC, BLM, BIA, City of Conrad, Town of Valier, communities of Heart Butte and Dupuyer, and local residents.	Year 1 (2007): Locate funding sources and conduct riparian zone evaluations and risk assessments of streams near populations centers. Years 2 – 5 (2008 – 11): Establish individual project plans to conduct restoration and fuels mitigation work in needed areas.
5.2.l: Implement a home and community defensible space project for the community and residents of Dupuyer.	**Protect people, structures, community, and firefighter safety in Dupuyer** by decreasing the ignition and fuels risk. Priority: Medium	County Commissioners, Pondera County Fire District, and residents of Dupuyer.	Year 1 (2007): Locate funding sources and conduct home site evaluations for structures in mapped Dupuyer project area with particular emphasis on property and public areas along Dupuyer Creek. Write project plans for individual landowners and the community. Year 2 (2008): Continue to work with homeowners to implement agreed upon home defensible space project plans. Years 2-5 (2008-11): Treat high risk wildland fuels from home site defensible space treatments to an area extending beyond home defensible spaces, where high accumulations of risky fuels exist near homes and infrastructure. Should link together home treatment areas. Treatments target high risk concentrations of fuels and not 100% of the area identified. To be completed only after or during the creation of home defensible spaces have been implemented.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.m: Implement a community defensible zone project around the Town of Valier along with fuels reduction projects in high risk areas around Lake Frances.	**Protect people, structures, community, and firefighter safety** by decreasing the ignition and fuels risk to the Town of Valier. Priority: Medium	Town of Valier, Pondera County Fire District, County Commissioners, Pondera Conservation District, and area landowners.	Year 1 (2007): Locate funding sources and conduct structure and area evaluations in mapped Valier project area. Community areas to target should include surrounding CRP lands, airfield, abandoned ball parks, and other untended fields. Write project plans for individual landowners. Year 2 (2008): Continue to work with homeowners to implement agreed upon defensible zone and fuels reduction project plans. Years 2-5 (2008-11): Treat wildland fuels in high risk or intensely used recreational areas around Lake Frances, particularly in locations where a wildland fire could spread into the city.
5.2.n: Implement a weed control and fuels mitigation project in the area between Interstate 15 and the City of Conrad.	**Protect people, structures, and firefighter safety** by decreasing the ignition and fuels risk to Conrad stemming from the multitude of ignition sources associated with the Interstate. Priority: High	City of Conrad in cooperation with the County Commissioners, the Pondera County Fire District, local home and business owners in Conrad, and the Pondera Conservation District.	Year 1 (2007): Establish a project plan to control invasive weeds in the corridor between Interstate 15 and the City of Conrad. At the same time, set up a project plan to manage fuels in this high risk area. Research potential funding sources and contact affected landowners. Year 2 (2008): Acquire funding to implement project plan on at least an annual basis. Obtain the necessary equipment, supplies, and personnel to implement project plan.
5.2.o: Create a fuel break around the community of Brady by disking within 100 feet of all community structures.	**Protect people, structures, and firefighter safety** by decreasing the fire risk around structures in Brady. Priority: Medium	County Commissioners in cooperation with local landowners, local home and businesses owners, and the community of Brady.	Year 1 (2007): Contact owners of land surrounding community structures in the community of Brady. Hire a local farmer with the necessary equipment to disc a 100 foot fuel break around the community. This project will also provide an opportunity for fire education/awareness for residents in Brady. In addition, set up an incentive program for landowners to help maintain fuel break and compensate for lost farming revenue.

5.4.1 Project Information

Community and structure based projects were further analyzed to provide additional information for funding, analysis, and prioritization. The projects listed below correspond with the project recommendations listed in Table 5.2. A map of the project areas is located in Appendix I.

Table 5.3. Additional project information.

Project Name	Project Description	Acres	# of Structures	Number of Parcels	Assessed Improvement Value
Brady Project	Mow and Disk Fuel Break Around Town, Defensible Space (5.2.d-g, o)	182	6	27	$487,884
Conrad Project	Education, Defensible Space (5.2.d-g)	3,117	157	199	$13,178,390
Ledger Project	Demolish Abandoned Buildings, Mow Untended Fields (5.2.h)	249	1	14	$5,360
Valier Project	Firesafe around Lake Frances and ball fields, Defensible Space (5.2.d-g, m)	4,205	278	709	$15,334,425
Dupuyer Project	Education, Manage Riparian Vegetation/Dead Wood, Defensible Space (5.2.d-g, k, l)	330	4	8	$198,020
Heart Butte Project	Education, Fuels Treatment, Fire Dept Support (5.2.d-g, i)	1,323	19	14	$204,500

5.5 Infrastructure

Significant infrastructure refers to the communications, transportation (road and rail networks), energy transport supply systems (gas and power lines), and water supply that service a region or a surrounding area. All of these components are important to Pondera County. These networks are by definition a part of the Wildland-Urban Interface in the protection of people, structures, **infrastructure**, and unique ecosystems. Without supporting infrastructure a community's structures may be protected, but the economy and way of life lost. As such, a variety of components will be considered here in terms of management philosophy, potential policy recommendations, and on-the-ground activities.

Communication Infrastructure: This component of the WUI seems to be diversified across the county with multiple source and destination points, and a spread-out support network. Although site specific treatments will impact local networks directly, little needs to be done to insure the system's viability. To ensure good communications with the DNRC, USFS, BIA, and the BLM resources, a narrow band capability is needed and the radios need to be able to be placed in "scan mode" to monitor cooperators frequencies.

Transportation Infrastructure (road and rail networks): This component of the WUI has some potential limitations in Pondera County. Specific infrastructure components have been discussed in this plan.

Ignitions along highways and railways are significant and should be addressed as part of the implementation of this plan. Various alternatives from herbicides to intensive livestock grazing coupled with mechanical treatments have been suggested. These corridors should be further evaluated with alternatives implemented. A variety of approaches will be appropriate depending on the landowner, fuels present, and other factors. These ignitions are substantial and the potential risk of lives to residents in the area is significant.

Many roads in the county have limiting characteristics, such as narrow travel surfaces, sharp turning radii, low load limit bridges and cattle guards, and heavy accumulations of fuels adjacent to some roads. Some of these road surfaces access remote forestland and rangeland areas. While their improvements will facilitate access in the case of a wildfire, they are not necessarily the priority for treatments in the County.

Roads that have these inferior characteristics and access homes and businesses are the priority for improvements in the county.

Energy Transport Supply Systems (gas and power lines): A number of power lines crisscross Pondera County. All of these power lines cross over rangeland ecosystems. When fires ignite in these vegetation types, the fires tend to be fast moving and burn at relatively low intensities. However, there is a potential for high temperatures and low humidity with high winds to produce enough heat and smoke to threaten power line stability. Most power line corridors have been cleared of vegetation both near the wires and from the ground below. It is the recommendation of this Community Wildfire Protection Plan that this situation be evaluated annually and monitored but that treatments not be specifically targeted at this time. The use of these areas as "fuel breaks" should be evaluated further, especially in light of the treatments enumerated in this plan (e.g., intensive livestock grazing, mechanical treatments, and herbicide treatments).

Table 5.4. Infrastructure Enhancements.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.4.a: Post "Emergency Evacuation Route" signs along the identified primary and secondary access routes in the county.	**Protection of people and structures by** informing residents and visitors of significant infrastructure in the county that will be maintained in the case of an emergency. Priority: High	County Commissioners in cooperation with the Pondera County Fire District and the County Planning Department.	Year 1 (2007): Purchase of signs. Posting roads and make information available to residents of the importance of Emergency Routes.
5.4.b: Create and maintain defensible space around critical infrastructure including, but not limited to communication sites, community shelters, government buildings (city, county, state, federal, and tribal), petroleum storage sites, hospitals, water storage sites, and PUD Service Stations.	**Protect people, structures, and increase firefighter safety** by decreasing the risk of loss of critical communications infrastructure to wildland fire. Priority: High	Pondera County Commissioners, City of Conrad, Town of Valier, Pondera County Public Utilities District, and various facility/utility owners.	Year 1 (2007): Meet with facility and utility owners operating communications infrastructure in Pondera County and set up a criteria for maintaining a defensible space in these areas. Year 2 (2008): Develop defensible space plans and begin implementing hazardous fuel reduction projects.

Table 5.4. Infrastructure Enhancements.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.4.c: Access improvements of bridges, cattle guards, culverts, and limiting road surfaces (e.g. Lake Frances access roads).	**Protection of people, structures, infrastructure, and economy** by improving access for residents and firefighting personnel in the event of a wildfire. Reduces the risk of a road failure that leads to the isolation of people or the limitation of emergency vehicle and personnel access during an emergency. Priority: Medium	County Commissioners and County Planning Department in cooperation with the State of Montana (Lands and Transportation), BLM, USFS, BIA, and private landowners.	Year 1 (2007): Update existing assessment of travel surfaces, bridges, and cattle guards in Pondera County as to location. Secure funding for implementation of this project (grants). Year 2 (2008): Conduct engineering assessment of limiting weight restrictions for all surfaces (e.g., bridge weight load maximums). Estimate cost of $500,000 which might be shared between County, BLM, USFS, State, BIA, and private based on landownership associated with road locations. Year 2 (2008): Post weight restriction signs on all limiting crossings, copy information to rural fire districts and wildland fire protection agencies in affected areas. Estimate cost at roughly $15-$25,000 for signs and posting. Year 3 (2009): Identify limiting road surfaces in need of improvements to support wildland firefighting vehicles and other emergency equipment. Develop plan for improving limiting surfaces including budgets, timing, and resources to be protected for prioritization of projects (benefit/cost ratio analysis). Create budget based on full assessment.
5.4.d: Fuels mitigation of the primary and secondary access routes in the county to insure these routes can be maintained in the case of an emergency.	**Protection of people and structures by** providing residents and visitors with ingress and egress that can be maintained during an emergency. Priority: High	County Commissioners in cooperation with the Pondera County Fire District, County Planning Department, DNRC, BLM, BIA, and private landowners.	Year 1 (2007): Full assessment of road defensibility and ownership participation. Implementation of projects (linked to item 5.2.i and 5.2.j.
5.4.e: Improve communications throughout the County by installing additional repeater towers and obtaining portable repeaters for emergency response personnel.	**Protection of people and structures** by providing improved communication resources. Priority: High	County Commissioners, County Emergency Manager, the Pondera County Fire District, Montana DNRC, USFS, BIA, and BLM.	Year 1 (2006): Summarize existing communication capabilities and limitations. Identify costs to add towers and obtain equipment and locate funding opportunities. Year 2 (2007): Acquire and install equipment as needed.

Table 5.4. Infrastructure Enhancements.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.4.f: Conduct fuels management of Burlington Northern Santa Fe railway through Pondera County.	**Protection of people, structures, infrastructure, and economy** by decreasing the potential for ignitions along this route. Priority: High	Burlington Northern Santa Fe Railroad and private landowners.	Year 1 (2007): Conduct assessment along railway corridor and begin development of a project action plan to reduce fuels and subsequently the potential fire hazard along this corridor. Target at least 20' from each side of the tracks for an estimated cost of approximately $700 per acre treated. Year 2 (2008): Conduct necessary environmental analyses. Year 3 (2009): Secure funding and begin laying out specific project areas. Year 4 – 9 (20010-2015): Implement projects.
5.4.g: Improve access to railroad along the Dry Fork of the Marias River for emergency access.	**Protection of people, structures, infrastructure, and economy** by improving emergency access in high risk areas. Priority: Low	Burlington Northern Santa Fe Railroad and private landowners.	Year 1 (2007): Identify potential access routes and conduct necessary environmental and engineering studies. Year 2 (2008): Begin contacting affected landowners and researching funding options. Year 3 (2009): Secure funding and begin laying out access route(s). Year 4 – 9 (2010-2015): Implement road projects.
5.4.h: Construct overpass across railroad tracks to provide uninterrupted access to east Conrad.	**Protection of people, structures, infrastructure, and economy** by improving emergency access in a high risk area. Priority: Medium	Burlington Northern Santa Fe Railroad, City of Conrad, and private landowners.	Year 1 (2007): Approach BNSF railroad regarding the need for an overpass and begin researching funding options. Identify best area for proposed overpass. Year 2 – 3 (2008-09): Conduct engineering assessments and develop a project implementation plan. Year 4 – 6 (2010 – 2012): Implement proposed construction project.
5.4.i: Establish a regular maintenance cycle and funding program for mowing road right-of-ways throughout the county.	**Protection of people, structures, infrastructure, and economy** by decreasing the potential for ignitions along this road corridors. Priority: High	County Commissioners, County Disaster and Emergency Services Coordinator, and County Road Department.	Year 1 (2007): Research potential funding sources and establish a prioritized list of regularly maintained roads countywide. Year 2 (2008): Acquire needed funding and begin roadside fuels maintenance program.

5.6 Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland firefighting departments in Pondera County. All of the needs identified by the departments are in line with increasing the ability to respond to emergencies in the WUI and are fully supported by the planning committee.

Specific reoccurring themes of needed resources and capabilities include:

- Development of dry hydrants in rural locations
- Improved radio capabilities within each district and for mutual aid operations
- Retention and recruitment of volunteers
- Training and development of rural firefighters in structure and wildland fire
- Enhancement of equipment available for rural and city departments

Although additional, and specific, needs were enumerated by the departments in Pondera County, these items were identified by multiple departments and/or in the public meetings. The implementation of each issue will rely on either the isolated efforts of the rural fire departments or a concerted effort by the county to achieve equitable enhancements across all of the departments.

Table 5.5. WUI Action Items in Firefighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.5.a: Enhance radio availability in each district, link in to existing dispatch, improve range within the region, and conversion to consistent standard of radio types.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: High	County Emergency Manager in cooperation with the Pondera County Fire District, USFS, BLM, BIA, DNRC, and Pondera County Commissioners.	Year 1 (2007): Summarize existing two-way radio capabilities and limitations. Identify costs to upgrade existing equipment and locate funding opportunities. Year 2 (2008): Acquire and install upgrades as needed.
5.5.b: Retention of volunteer firefighters.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: High	Pondera County Fire District, DNRC, BIA, BLM, and USFS working with a broad base of county citizenry to identify options, determine plan of action, and implement it.	5 Year Planning Horizon with extended planning time frame. Target an increased recruitment (+10%) and retention (+20% longevity) of volunteers. Year 1 (2007): Develop incentives program and implement it.

Table 5.5. WUI Action Items in Firefighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.5.c: Establish and map onsite water sources such as hydrants or underground storage tanks and drafting or dipping sites.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: High	County Commissioners, County Emergency Manager, and the Pondera County Fire District.	Year 1 (2007): Identify populated areas lacking sufficient water supplies and develop project plans to develop a permanent water source or drafting/dipping sites. Implement project plans and begin mapping (GPS) known water sources and drafting/dipping sites to be provided to fire response agencies and County offices.
5.5.d: Increased training and capabilities of firefighters.	**Protection of people and structures** by direct fire fighting capability enhancements. Priority: High	Pondera County Fire District working with the DNRC, BLM, USFS, BIA, and MSU Extension for wildland training opportunities and with the State Fire School for structural firefighting training.	Year 1 (2007): Develop a multi-county training schedule that extends 2 or 3 years in advance (continuously). Identify funding and resources needed to carry out training opportunities and sources of each to acquire. Year 1 (2007): Begin implementing training opportunities for volunteers.
5.5.e: Improve safety equipment and PPE's for all Fire Departments in Pondera County.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: High	County Emergency Manager in cooperation with County Commissioners and the Pondera County Fire District.	Year 1 (2007): Complete an inventory of all supplies held by the Fire Departments (boots, turnouts, Nomex, gloves, modern lighting, straps, and hardware), and complete a needs assessment matching expected replacement schedule. Develop countywide re-supply process for needed equipment.
5.5.f: Redefine boundaries of the Valier Fire Department to include area bounded by Interstate 15, State Route 44, and Lone Tree Lane (partial) in northern Pondera County currently within Conrad Fire Department's jurisdiction.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: High	County Emergency Manager in cooperation with County Commissioners and the Pondera County Fire District.	Year 1 (2007): Develop an annexation proposal for the Valier Fire Department and begin public education of the issue.

Table 5.5. WUI Action Items in Firefighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.5.g: Build a centralized Pondera County fire training center.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: High	County Emergency Manager, County Commissioners, MSU Extension, and the Pondera County Fire District.	Year 1 (2007): Prepare project and business plans and obtain funding. Year 2 - 4 (2008-10): Locate and purchase site of new training facility and begin construction. Year 5 (2010): Purchase needed equipment to operate the facility.
5.5.h: Obtain a 1,000-1,250 gpm pumper (1,000 gal capacity), a top mount panel, and a crew cab pickup for the City of Conrad Fire Department.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: High	City of Conrad Fire Department	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources. Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
5.5.i: Update rolling stock and radios for the Brady Fire Department.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: Medium	Brady Fire Department	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources. Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
5.5.j: Obtain funding to reside the Brady Fire Station.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: Medium	Brady Fire Department	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources. Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
5.5.k: Obtain funding for complete air fill system, gas powered turbo blower, 10 structural helmets, 13 updated radios, and repeater for the Dupuyer Volunteer Fire Department as specified in recent grant application.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: Medium	Dupuyer Volunteer Fire Department	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources. Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
5.5.l: Update tender and add on to existing Dupuyer fire station.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: Medium	Dupuyer Volunteer Fire Department	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources. Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.

Table 5.5. WUI Action Items in Firefighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.5.m: Obtain funding for pagers, flappers, shovels, a 10 HP electric pump, and a ¾ ton 4-door Quick Response Unit for the Valier Fire Department.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: High	Valier Fire Department	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources. Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.
5.5.n: Obtain funding for a Type 6 pumper truck and an additional slip tank for the Heart Butte Fire Department.	**Protection of people and structures** by direct firefighting capability enhancements. Priority: Medium	Heart Butte Fire Department	Year 1 (2007): Verify stated need still exists, develop budget, and locate funding and equipment (surplus) sources. Year 1 or 2 (2007-08): Acquire and deliver needed materials and equipment.

5.7 Regional Land Management Recommendations

In section 5.3 of this plan, reference was given to the role that grazing and agriculture have in promoting wildfire mitigation services through active management. Pondera County is dominated by wide expanses of rangelands intermixed with communities and rural houses.

Wildfires will continue to ignite and burn fuels and homes depending on the weather conditions and other factors enumerated earlier. However, active land management that modifies fuels, promotes healthy range and forestland conditions, and promotes the use of these natural resources (consumptive and non-consumptive) will insure that these lands have value to society and the local region. We encourage the Bureau of Land Management, the Montana Department of Natural Resources and Conservation, the Bureau of Reclamation, industrial land owners, private land owners, and all other landowners in the region to actively administer their Wildland-Urban Interface lands in a manner consistent with the management of reducing fuels and risks in this zone.

5.7.1 Conservation Reserve Program

The fire hazard associated with the abundant Conservation Reserve Program (CRP) lands has become a prominent issue for all fire departments and emergency personnel in Pondera County. Due to the lack of management on CRP, a dense mat of highly flammable fuels build up as they sit in fallow year after year. Fires in these fuels burn at very high intensities with large flame lengths, particularly under the influence of the strong winds common in Pondera County. Once ignited, CRP fires can burn very rapidly, jumping roads and other barriers that would normally inhibit a natural range or grass fire. In the recent past, uncontrolled CRP fires have burned hundreds of acres and threatened countless homes and critical infrastructure such as main highways and power poles in Montana.

It is the recommendation of this plan that Pondera County enacts a policy defining an active management plan for fire hazard fuel reduction on Conservation Reserve Program lands. This plan should be based on a three year rotation where a certain number of acres are treated each year. Potential treatment options may include, but are not limited to, grazing, haying, prescribed fire, and/or tilling. Pondera County believes active management will reduce the fire risk associated with these fuels and cut down on the number of CRP fires responded to each year.

This is especially critical on those acres adjacent to homes, businesses, and critical infrastructure.

Chapter 6: Supporting Information

6 Supporting Information

6.1 List of Tables

6.2 Table of Figures

6.3 Signature Pages

This **Pondera County Community Wildfire Protection Plan** has been developed in cooperation and collaboration with the representatives of the following organizations, agencies, and individuals.

6.3.1 Pondera County Resolution

PONDERA COUNTY, MONTANA
RESOLUTION NO. 31 – 2006/07

DECLARING SUPPORT AND ADOPTING THE PONDERA COUNTY COMMUNITY WILDFIRE PROTECTION PLAN

WHEREAS, the Board of Pondera County Commissioners supports the Pondera County Community Wildfire Protection Plan; and

WHEREAS, the Pondera County Community Wildfire Protection Plan will be utilized as a guide for planning as related to FEMA Pre-Disaster Mitigation, The National Fire Plan, The Healthy Forest Restoration Act, and other purposes as deemed appropriate by the Pondera County Commissioners.

NOW, THEREFORE, BE IT RESOLVED that the Pondera County Commissioners do hereby adopt, support, and will facilitate the Pondera County Community Wildfire protection Plan's implementation.

Adopted this 2nd day of May, 2007 as moved by Commissioner Johnson, seconded by Commissioner Christiaens, and passed on a 2-0 vote of the full board. Effective upon passage and approval.

BOARD OF COUNTY COMMISSIONERS

Joseph Christiaens, Chairman

Cynthia A. Johnson, Member

ATTEST: Janice Hoppes
Janice Hoppes, Clerk & Recorder

(absent)
Sandra J. Broesder, Member

6.3.2 City of Conrad Resolution

Resolution of the City Council of Conrad
located in Pondera County, Montana
946

A resolution of the City Council of Conrad declaring City support and adoption of the Pondera County Community Wildfire Protection Plan.

Whereas, The City Council of Conrad supports the Pondera County Community Wildfire Protection Plan, and

Whereas, The City Council of Conrad has participated in the development of the Pondera County Community Wildfire Protection Plan, and

Whereas, The Pondera County Community Wildfire Protection Plan will be utilized as a guide for planning as related to FEMA Pre-Disaster Mitigation, The National Fire Plan, The Healthy Forest Restoration Act, and other purposes as deemed appropriate by the City Council of Conrad,

Therefore be it resolved, that the City Council of Conrad does hereby adopt, support, and will facilitate the Pondera County Community Wildfire Protection Plan's implementation.

Passed and approved this 21 Day of May 2007

City Council of Conrad located in Pondera County, Montana

John P. Shevlin

By: John P. Shevlin
Mayor, City of Conrad

Attested by:
Finance Officer, City of Conrad

6.3.3 Town of Valier Resolution

Resolution # 77 of the Town Council of Valier located in Pondera County, Montana

A resolution of the Town Council of Valier declaring Town support and adoption of the Pondera County Community Wildfire Protection Plan.

Whereas, The Town Council of Valier supports the Pondera County Community Wildfire Protection Plan, and

Whereas, The Town Council of Valier has participated in the development of the Pondera County Community Wildfire Protection Plan, and

Whereas, The Pondera County Community Wildfire Protection Plan will be utilized as a guide for planning as related to FEMA Pre-Disaster Mitigation, The National Fire Plan, The Healthy Forest Restoration Act, and other purposes as deemed appropriate by the Town Council of Valier,

Therefore be it resolved, that the Town Council of Valier does hereby adopt, support, and will facilitate the Pondera County Community Wildfire Protection Plan's implementation.

Passed and approved this 16 Day of May 2007

Town Council of Valier located in Pondera County, Montana

By: Velda Loch
Mayor, Town of Valier

Attested by:
Clerk/Treasurer, Town of Valier

6.3.4 Fire Department Representatives

These fire departments and districts collaborated in the development of this Plan.

Roger Keith — 5-16-07

By: Roger Keith, Secretary
Pondera County Rural Fire District — Date

Kevin Moritz — 5/16/07

By: Kevin Moritz, Chief
City of Conrad Fire Department — Date

Rod Christiaens — 5-16-07.

By: Rod Christiaens, Chief
Valier Volunteer Fire Department — Date

Kevin Henke — 5-23-07

By: Kevin Henke, Chief
Dupuyer Volunteer Fire Department — Date

Roy Vanden Bos — 5/21/07

By: Roy Vanden Bos, Chief
Brady Fire Department — Date

Francis Wild Gun — 5-25-07

By: Francis Wild Gun, Chief
Heart Butte Volunteer Fire Department — Date

6.3.5 Representatives of Community Organizations, Federal, and State Agencies

These agencies and organizations collaborated and cooperated in the development of this Plan.

5/21/07

By: Erik Eneboe, Unit Manager — Date
Montana Department of Natural Resources and Conservation

Lesley W. Thompson — 5/29/07

By: Lesley W. Thompson, Forest Supervisor — Date
Lewis and Clark National Forest

June Bailey — 5-21-07

By: June Bailey, Field Manager — Date
Bureau of Land Management

By: — Date
Blackfeet Tribe

By: — Date
Bureau of Indian Affairs

Cindy Mullaney — 5-16-07

By: Cindy Mullaney — Date
Pondera County Emergency Management Coordinator

Gerald M. Smith — 5-21-07

By: Gerald M. Smith, Chairman — Date
North Central Montana RC&D

Tera R. King

By: Tera R. King, Project Manager — Date
Northwest Management, Inc.

6.4 Glossary of Terms

Anadromous - Fish species that hatch in fresh water, migrate to the ocean, mature there, and return to fresh water to reproduce (Salmon & Steelhead).

Appropriate Management Response - Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

Biological Assessment - Information document prepared by or under the direction of the Federal agency in compliance with U.S. Fish and Wildlife standards. The document analyzes potential effects of the proposed action on listed and proposed threatened and endangered species and proposed critical habitat that may be present in the action area.

Backfiring - When attack is indirect, intentionally setting fire to fuels inside the control line to contain a rapidly spreading fire. Backfiring provides a wide defense perimeter, and may be further employed to change the force of the convection column.

Blackline - Denotes a condition where the fireline has been established by removal of vegetation by burning.

Burning Out - When attack is direct, intentionally setting fire to fuels inside the control line to strengthen the line. Burning out is almost always done by the crew boss as a part of line construction; the control line is considered incomplete unless there is no fuel between the fire and the line.

Canyon Grassland - Ecological community in which the prevailing or characteristic plants are grasses and similar plants extending from the canyon rim to the rivers edge.

Confine - Confinement is the strategy employed in appropriate management responses where a fire perimeter is managed by a combination of direct and indirect actions and use of natural topographic features, fuel, and weather factors.

Contingency Plans: Provides for the timely recognition of approaching critical fire situations and for timely decisions establishing priorities to resolve those situations.

Control Line - An inclusive term for all constructed or natural fire barriers and treated fire edge used to control a fire.

Crew - An organized group of firefighters under the leadership of a crew boss or other designated official.

Crown Fire - A fire that advances from top to top of trees or shrubs more or less independently of the surface fire. Sometimes crown fires are classed as either running or dependent, to distinguish the degree of independence from the surface fire.

Disturbance - An event which affects the successional development of a plant community (examples: fire, insects, windthrow, timber harvest).

Disturbed Grassland - Grassland dominated by noxious weeds and other exotic species. Greater than 30% exotic cover.

Diversity - The relative distribution and abundance of different plant and animal communities and species within an area.

Drainage Order - Systematic ordering of the net work of stream branches, (e.g., each non-branching channel segment is designated a first order stream, streams which only receive first order segments are termed second order streams).

Duff - The partially decomposed organic material of the forest floor beneath the litter of freshly fallen twigs, needles, and leaves.

Ecosystem - An interacting system of interdependent organisms and the physical set of conditions upon which they are dependent and by which they are influenced.

Ecosystem Stability - The ability of the ecosystem to maintain or return to its steady state after an external interference.

Ecotone - The area influenced by the transition between plant communities or between successional stages or vegetative conditions within a plant community.

Energy Release Component - The Energy Release Component is defined as the potential available energy per square foot of flaming fire at the head of the fire and is expressed in units of BTUs per square foot.

Equivalent Clearcut Area (ECA) - An indicator of watershed condition, which is calculated from the total amount of crown removal that has occurred from harvesting, road building, and other activities based on the current state of vegetative recovery.

Exotic Plant Species - Plant species that are introduced and not native to the area.

Fire Adapted Ecosystem - An arrangement of populations that have made long-term genetic changes in response to the presence of fire in the environment.

Fire Behavior - The manner in which a fire reacts to the influences of fuel, weather, and topography.

Fire Behavior Forecast - Fire behavior predictions prepared for each shift by a fire behavior analysis to meet planning needs of fire overhead organization. The forecast interprets fire calculations made, describes expected fire behavior by areas of the fire, with special emphasis on personnel safety, and identifies hazards due to fire for ground and aircraft activities.

Fire Behavior Prediction Model - A set of mathematical equations that can be used to predict certain aspects of fire behavior when provided with an assessment of fuel and environmental conditions.

Fire Danger - A general term used to express an assessment of fixed and variable factors such as fire risk, fuels, weather, and topography which influence whether fires will start, spread, and do damage; also the degree of control difficulty to be expected.

Fire Ecology - The scientific study of fire's effects on the environment, the interrelationships of plants, and the animals that live in such habitats.

Fire Exclusion - The disruption of a characteristic pattern of fire intensity and occurrence (primarily through fire suppression).

Fire Intensity Level - The rate of heat release (BTU/second) per unit of fire front. Four foot flame lengths or less are generally associated with low intensity burns and four to six foot flame lengths generally correspond to "moderate" intensity fire effects. High intensity flame lengths are usually greater than eight feet and pose multiple control problems.

Fire Prone Landscapes – The expression of an area's propensity to burn in a wildfire based on common denominators such as plant cover type, canopy closure, aspect, slope, road density, stream density, wind patterns, position on the hillside, and other factors.

Fireline - A loose term for any cleared strip used in control of a fire. That portion of a control line from which flammable materials have been removed by scraping or digging down to the mineral soil.

Fire Management - The integration of fire protection, prescribed fire and fire ecology into land use planning, administration, decision making, and other land management activities.

Community Wildfire Protection Plan (CWPP) - A strategic plan that defines a program to manage wildland and prescribed fires and documents the fire management program in the

approved land use plan. This plan is supplemented by operational procedures such as preparedness, preplanned dispatch, burn plans, and prevention. The fire implementation schedule that documents the fire management program in the approved forest plan alternative.

Fire Management Unit (FMU) - Any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that set it apart from management characteristics of an adjacent unit. FMU's are delineated in FMP's. These units may have dominant management objectives and preselected strategies assigned to accomplish these objectives.

Fire Occurrence - The number of wildland fires started in a given area over a given period of time. (Usually expressed as number per million acres.)

Fire Prevention - An active program in conjunction with other agencies to protect human life, prevent modification, of the ecosystem by human-caused wildfires, and prevent damage to cultural resources or physical facilities. Activities directed at reducing fire occurrence, including public education, law enforcement, personal contact, and reduction of fire risks and hazards.

Fire Regime - The fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation. Fire regimes exist on a continuum from short-interval, low-intensity (stand maintenance) fires to long-interval, high-intensity (stand replacement) fires.

Fire Retardant - Any substance that by chemical or physical action reduces flareability of combustibles.

Fire Return Interval - The number of years between two successive fires documented in a designated area.

Fire Risk - The potential that a wildfire will start and spread rapidly as determined by the presence and activities of causative agents.

Fire Severity - The effects of fire on resources displayed in terms of benefit or loss.

Foothills Grassland - Grass and forb co-dominated dry meadows and ridges. Principle habitat type series: bluebunch wheatgrass and Idaho fescue.

Fuel - The materials which are burned in a fire; duff, litter, grass, dead branchwood, snags, logs, etc.

Fuel Break - A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled.

Fuel Loading - Amount of dead fuel present on a particular site at a given time; the percentage of it available for combustion changes with the season.

Fuel Model - Characterization of the different types of wildland fuels (trees, brush, grass, etc.) and their arrangement, used to predict fire behavior.

Fuel Type - An identifiable association of fuel elements of distinctive species; form, size, arrangement, or other characteristics, that will cause a predictable rate of fire spread or difficulty of control, under specified weather conditions.

Fuels Management - Manipulation or reduction of fuels to meet protection and management objectives, while preserving and enhancing environmental quality.

Gap Analysis Program (GAP) - Regional assessments of the conservation status of native vertebrate species and natural land cover types and to facilitate the application of this information to land management activities. This is accomplished through the following five objectives:

1. Map the land cover of the United States

2. Map predicted distributions of vertebrate species for the U.S.
3. Document the representation of vertebrate species and land cover types in areas managed for the long-term maintenance of biodiversity
4. Provide this information to the public and those entities charged with land use research, policy, planning, and management
5. Build institutional cooperation in the application of this information to state and regional management activities

Habitat - A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or population of plants or animals.

Heavy Fuels - Fuels of a large diameter, such as snags, logs, and large limbwood, which ignite and are consumed more slowly than flash fuels.

Hydrologic Unit Code - A coding system developed by the U. S. Geological Service to identify geographic boundaries of watersheds of various sizes.

Hydrophobic - Resistance to wetting exhibited by some soils, also called water repellency. The phenomena may occur naturally or may be fire-induced. It may be determined by water drop penetration time, equilibrium liquid-contact angles, solid-air surface tension indices, or the characterization of dynamic wetting angles during infiltration.

Human-Caused Fires - Refers to fires ignited accidentally (from campfires or smoking) and by arsonists; does not include fires ignited intentionally by fire management personnel to fulfill approved, documented management objectives (prescribed fires).

Intensity - The rate of heat energy released during combustion per unit length of fire edge.

Inversion - Atmospheric condition in which temperature increases with altitude.

Ladder Fuels - Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

Landsat Imagery - Land remote sensing, the collection of data which can be processed into imagery of surface features of the Earth from an unclassified satellite or satellites.

Landscape - All the natural features such as grasslands, hills, forest, and water, which distinguish one part of the earth's surface from another part; usually that portion of land which the eye can comprehend in a single view, including all its natural characteristics.

Lethal - Relating to or causing death; extremely harmful.

Lethal Fires - A descriptor of fire response and effect in forested ecosystems of high-severity or severe fire that burns through the overstory and understory. These fires typically consume large woody surface fuels and may consume the entire duff layer, essentially destroying the stand.

Litter - The top layer of the forest floor composed of loose debris, including dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Maximum Manageable Area - The boundary beyond which fire spread is completely unacceptable.

Metavolcanic - Volcanic rock that has undergone changes due to pressure and temperature.

Minimum Impact Suppression Tactic (MIST) - "Light on the Land." Use of minimum amount of forces necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives. It implies a greater sensitivity to the impacts of

suppression tactics and their long-term effects when determining how to implement an appropriate suppression response.

Mitigation - Actions to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice.

Monitoring Team - Two or more individuals sent to a fire to observe, measure, and report its behavior, its effect on resources, and its adherence to or deviation from its prescription.

National Environmental Policy Act (NEPA) - This act declared a national policy to encourage productive and enjoyable harmony between humans and their environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and will stimulate the health and welfare of humankind; to enrich the understanding of important ecological systems and natural resources; and to establish a Council on Environmental Quality.

National Fire Management Analysis System (NFMAS) - The fire management analysis process, which provides input to forest planning and forest and regional fire program development and budgeting.

Native - Indigenous; living naturally within a given area.

Natural Ignition - A wildland fire ignited by a natural event such as lightning or volcanoes.

Noncommercial Thinning - Thinning by fire or mechanical methods of precommercial or commercial size timber, without recovering value, to meet MFP standards relating to the protection/enhancement of adjacent forest or other resource values.

Notice of Availability - A notice of Availability published in the Federal Register stating that an EIS has been prepared and is available for review and comment (for draft) and identifying where copies are available.

Notice of Intent - A notice of Intent published in the Federal Register stating that an EIS will be prepared and considered. This notice will describe the proposed action and possible alternatives, the proposed scoping process, and the name and address of whom to contact concerning questions about the proposed action and EIS.

Noxious Weeds - Rapidly spreading plants that have been designated “noxious” by law which can cause a variety of major ecological impacts to both agricultural and wild lands.

Planned Ignition - A wildland fire ignited by management actions to meet specific objectives.

Prescribed Fire - Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescription - A set of measurable criteria that guides the selection of appropriate management strategies and actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Programmatic Biological Assessment - Assesses the effects of the fire management programs on federally listed species, not the individual projects that are implemented under these programs. A determination of effect on listed species is made for the programs, which is a valid assessment of the potential effects of the projects completed under these programs, if the projects are consistent with the design criteria and monitoring and reporting requirement contained in the project description and summaries.

Reburn - Subsequent burning of an area in which fire has previously burned but has left flareable light that ignites when burning conditions are more favorable.

Riparian Habitat Conservation Areas (RHCA) - Portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands,

intermittent headwater streams, and other areas where proper ecological functioning is crucial to maintenance of the stream's water, sediment, woody debris, and nutrient delivery systems.

Riparian Management Objectives (RMO) - Quantifiable measures of stream and streamside conditions that define good fish habitat and serve as indicators against which attainment or progress toward attainment of goals will be measured.

Road Density - The volume of roads in a given area (mile/square mile).

Scoping - Identifying at an early stage the significant environmental issues deserving of study and de-emphasizing insignificant issues, narrowing the scope of the environmental analysis accordingly.

Seral - Refers to the stages that plant communities go through during succession. Developmental stages have characteristic structure and plant species composition.

Serotinous - Storage of coniferous seeds in closed cones in the canopy of the tree. Serotinous cones of lodgepole pine do not open until subjected to temperatures of 113 to 122 degrees Fahrenheit causing the melting of the resin bond that seals the cone scales.

Stand Replacing Fire - A fire that kills most or all of a stand.

Sub-basin - A drainage area of approximately 800,000 to 1,000,000 acres, equivalent to a 4th - field Hydrologic Unit Code.

Surface Fire - Fire which moves through duff, litter, woody dead and down, and standing shrubs, as opposed to a crown fire.

Watershed - The region draining into a river, river system, or body of water.

Wetline - Denotes a condition where the fireline has been established by wetting down the vegetation.

Wildland Fire - Any nonstructure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Implementation Plan (WFIP) - A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits. A full WFIP consists of three stages. Different levels of completion may occur for differing management strategies (i.e., fires managed for resource benefits will have two-three stages of the WFIP completed while some fires that receive a suppression response may only have a portion of Stage I completed).

Wildland Fire Situation Analysis (WFSA) - A decision making process that evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives.

Wildland Fire Use - The management of naturally ignited wildland fires to accomplish specific prestated resource management objectives in predefined geographic areas outlined in FMP's. Operational management is described in the WFIP. Wildland fire use is not to be confused with "fire use", which is a broader term encompassing more than just wildland fires.

Wildland Fire Use for Resource Benefit (WFURB) - A wildland fire ignited by a natural process (lightning), under specific conditions, relating to an acceptable range of fire behavior and managed to achieve specific resource objectives.

Xeriscape - a trademark for a method of landscaping that emphasizes water conservation in its use of drought-resistant plants

6.5 Literature Cited

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