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Wildhorse Fuels Reduction
Draft Environmental Assessment

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Submitted by:
Ecosystem Management, Inc.
4004 Carlisle Blvd NE Suite C1
Albuquerque, New Mexico 87107

Table of Contents

Chapters Page

1.0 PURPOSE AND NEED 1
1.1 INTRODUCTION 1
1.2 BACKGROUND 1
1.3 NEED FOR ACTION 4
1.4 CONFORMANCE WITH APPLICABLE LAND USE PLANNING 4
1.5 APPLICABLE LEGAL AND REGULATORY RESTRAINTS AND COORDINATION 5
2.0 PROPOSED ACTION AND ALTERNATIVES 8
2.1 THE NO ACTION ALTERNATIVE 8
2.2 PROPOSED ACTION 8
3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS 14
3.1 TOPOGRAPHY 14
3.2 CLIMATE 14
3.3 GENERAL VEGETATION 14
3.4 FOREST VEGETATION 15
3.5 RANGE VEGETATION 16
3.6 RIPARIAN VEGETATION/AREAS 18
3.7 SPECIAL STATUS PLANTS 19
3.8 NOXIOUS WEEDS 19
3.9 VEGETATION IMPACTS: GENERAL DISCUSSION 19
3.10 FORESTRY 20
3.11 FUELS/FIRE ECOLOGY/FIRE HISTORY/FIRE REGIME AND CONDITION CLASS 21
3.12 WILDLIFE 23
3.13 LIVESTOCK GRAZING 25
3.14 AIRSHED 26
3.15 HYDROLOGY 27
3.16 SOILS 29
3.17 GEOLOGY/MINERALS 32
3.18 CULTURAL RESOURCES 32
3.19 LANDS/REALTY/RIGHTS-OF-WAY (ROW) 34
3.20 RECREATION 34
3.21 VISUAL RESOURCE MANAGEMENT 35
4.0 PERSONS AND AGENCIES CONSULTED 36
5.0 LIST OF PREPARERS 36
6.0 LITERATURE CITED 37
APPENDIX A 40
APPENDIX B 43
APPENDIX C 47
APPENDIX D 48
APPENDIX E 49

FIGURES

Figure 1. Wildhorse project vicinity. 2

Figure 2. Wildhorse project boundary. 3

Chapter 1.0: Purpose and Need

1.1 Introduction

The Montana BLM Miles City Field Office proposes to improve forest, upland, and riparian health by applying fuels treatments in the Wildhorse Hazard Fuels Reduction Project area, an area of approximately 240 square miles. The Wildhorse Hazard Fuels Reduction Project involves an area of approximately 240 square miles (mi^2), extending from Township 2 North to Township 6 North and from Range 42 East to Range 45 East. This area is located in southeastern Montana, south of the Yellowstone River, and between the towns of Miles City and Forsyth (See Figures 1 and 2). Within the project area the land ownership pattern is checker boarded with 22,239 acres of Bureau of Land Management (BLM) administered lands, 13,505 acres of Montana Department of Natural Resources and Conservation (MT DNRC) and 223,083 acres of private in Custer and Rosebud Counties of Montana. The project area lies south of the Yellowstone River, west of the Moon Creek road, east of the Rosebud Creek road and north of the Snyder Creek road. Portions of the private land within the project area consist of numerous small tracts (subdivisions). These small tracts are owned by numerous individuals who may or may not reside on the property. Many of the tracts are timbered and many hold structures. Access to these tracts is limited. A federal highway and/or a county road run(s) through the area and these roads provide access to the tracts.

Objectives of the treatments would include:

- Decreasing the risk of wildfire to public and firefighter safety as well as the risk of loss of structures, crops, property, and resources due to fire by reducing the amount and continuity of stands of conifers and other woody species.
- Maintaining the reduced level of risk and natural fuel loads through follow-up treatments.
- Increasing the health, vigor, and productivity of the native plant community through the reduction of conifers and corresponding increase in availability of water and nutrients.
- Improving forest health by reducing the number of trees of various age classes.
- Protecting existing identified important wildlife habitat (big game winter range, grouse leks, etc) through the reduction in flammability of vegetation, the increase in “edge”, and increase in availability of sunlight, nutrients, and water resulting from the treatments. Increase wildlife management options to achieve desired/identified habitat characteristics for special status and economically important species.
- Achieve a more open, fire resilient stand by returning densities of woody vegetation to conditions within the known range of historical variability [Fire Regime Condition Class (FRCC) Reference Conditions: Potential Natural Vegetation Group (PNVG): Ponderosa Pine].
- Avoid or mitigate adverse impact to the environment and activities which currently occur while implementing fuels treatments.

1.2 Background

In the area boundaries are two subdivisions (Wildhorse Ranch and Miller Creek), scattered ranches and thirty three rights-of-way (ROW) including a railroad, roads, power and telephone

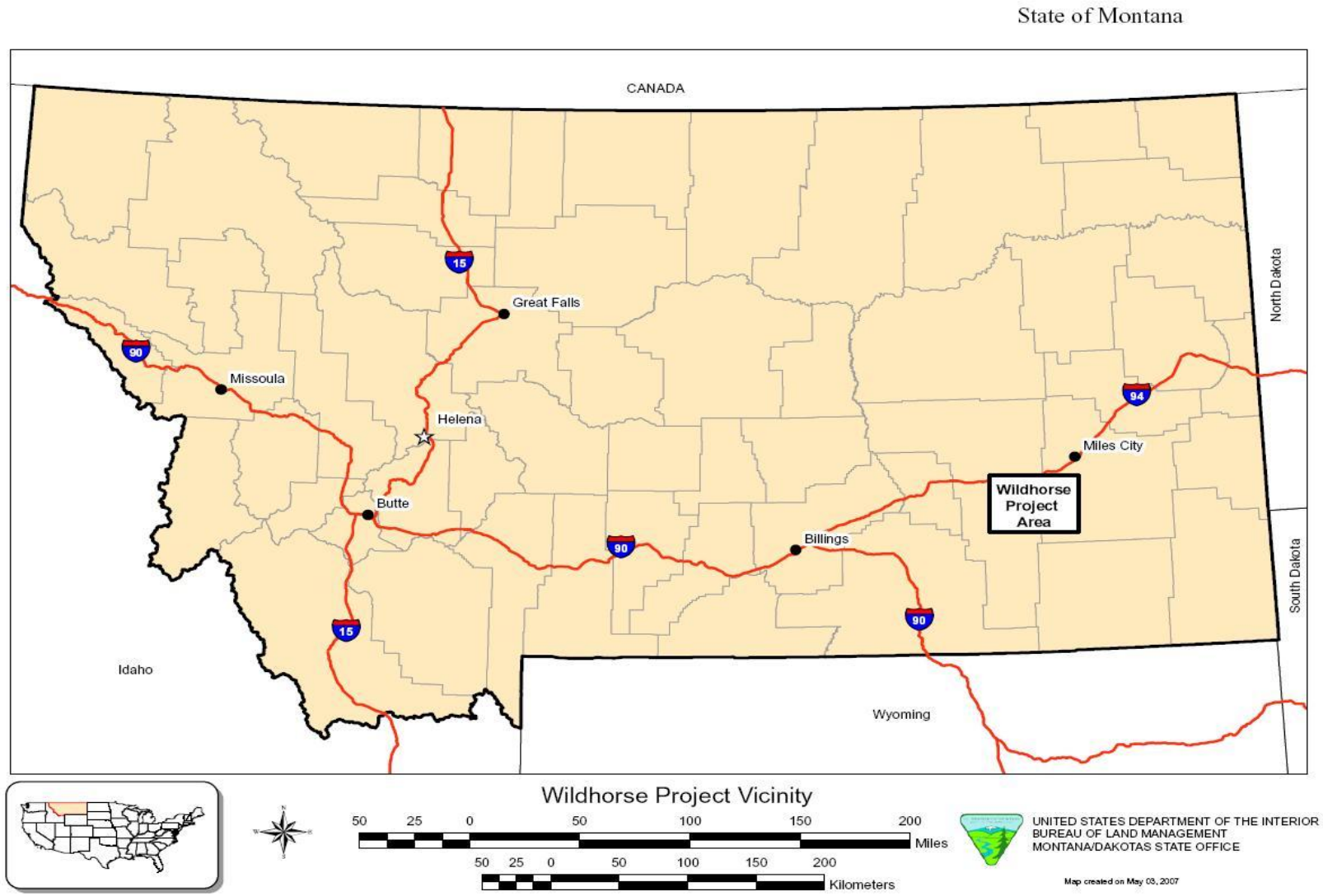

Figure 1. Map of the Wildhorse Project Vicinity

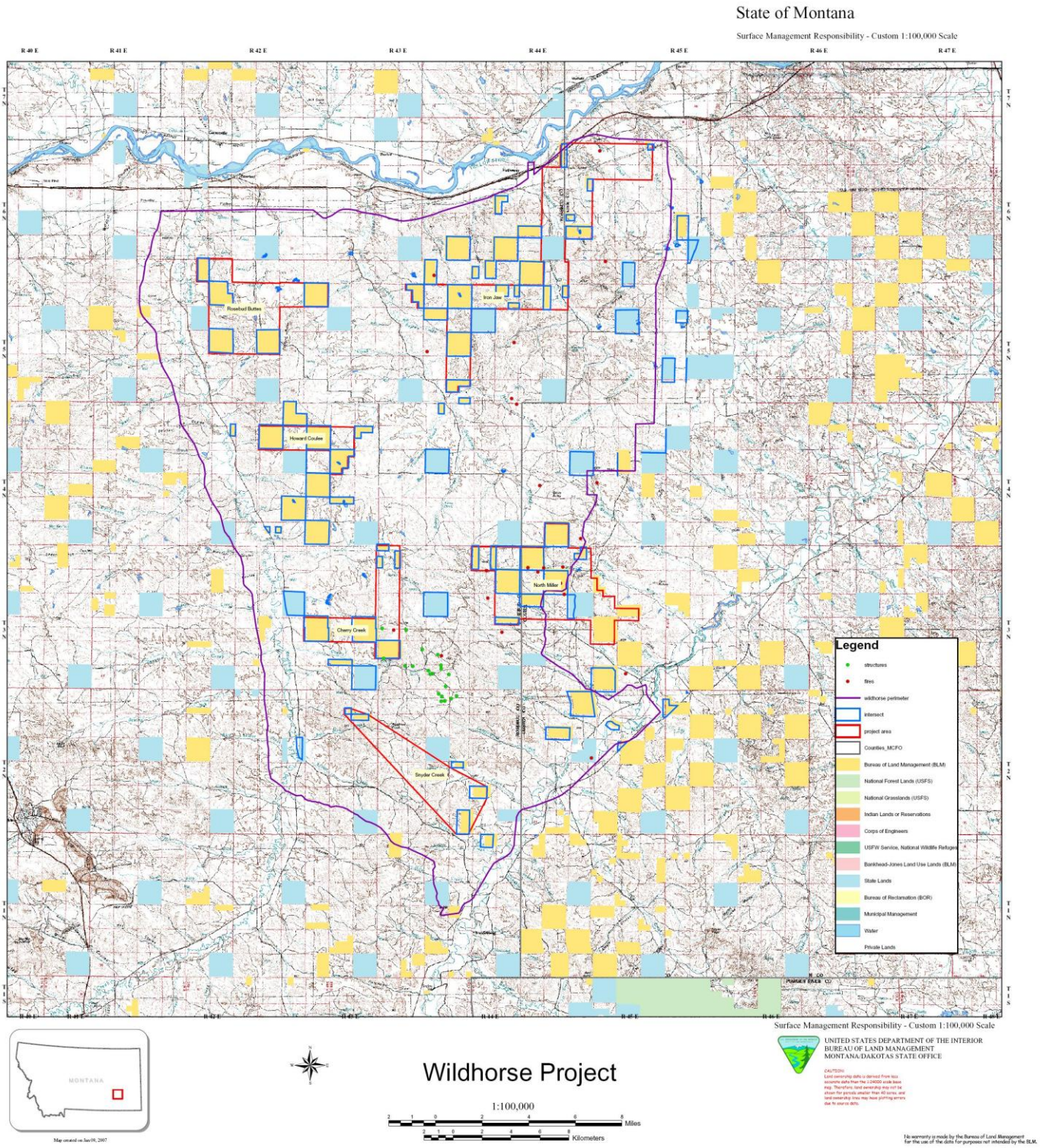

Figure 2. Map of Wildhorse Project Area

lines, oil and gas lines, and communications sites in the area.

In the area wildfires occur regularly. During the last twenty years 20 documented wildfires have occurred on BLM administered lands, burning a total of 36,482 acres. The Rosebud fire of 1996 at 26,000 acres is the largest of those recorded fires to date. Fires generally occur in the summer months with exceptions as conditions dictate, but can occur yearlong. In 2004, 4 fires occurred beginning with the earliest in April with Well fire (500 acres) and ended in October with the Woods fire (5 acres). Other fires which are not recorded in this document have occurred on private and state lands within the area boundaries. There is an increasing development of wildland-urban interface areas with potential access problems; and to date, very few private properties have been treated to improve defensible space (e.g., as recommended through Firewise or similar programs).

1.3 Need for Action

The need to reduce hazardous fuels is a major component of the National Fire Plan (United States Department of Interior 2000), The Montana State Office BLM Fire/Fuels Management Plan Environmental Assessment Plan Amendment for Montana and the Dakotas (United States Department of Interior Bureau of Land Management Montana State Office 2003) and the Miles City Field Office (MCFO), Montana BLM Fire Management Plan. The demonstrated risk to public and firefighter safety, structures, property, crops, infrastructure, and natural resources by past wildfires; and the regular occurrence of large and quickly growing wildfires indicate the need to change the density and distribution of forest vegetation in the project area. Large fires have occurred on a regular basis in the project area and have been difficult to control. Receptive and continuous fuels have allowed fires to spread quickly under normal summer weather and have also enabled fire starts to grow in other times of the year. The high densities of conifers in the area contribute to high levels of flammable natural fuels. These fuels are present in a dense continuous fashion both horizontally and vertically in patches of timber. Continued drought conditions have begun to modify but have stressed large fuels while insect infestations are providing more standing dead fuels. Drought-stressed conifer stands have contributed to large fire spread, where high fire intensities have not allowed for aggressive initial attack or fire suppression with ground forces due to safety concerns. Conditions are similar on adjacent tracts of private and state land. In years of average to above average precipitation, grass growth links these patches of timber resulting in a continuous fuel load. The observed risk to and potential loss of property and natural resources are of concern to area residents, county officials, and land managers. The fuels have moved from a Fire Regime Condition Class (FRCC) 1 to FRCC 2 and 3, which degrading habitat related to wildlife habitat needs and ecosystem health. The conversion of prairie grasslands to conifer type is a detriment of the grassland nesting birds, and conversion of hardwood and mesic drainages to conifer types is a detriment of the riparian nesting species.

1.4 Conformance with Applicable Land Use Planning

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this environmental assessment (EA) tiers to and incorporates by reference the information and analysis regarding fire management contained in pages 12, 14, 15, 74, 157, 161and 162 of the *Resource Management Plan and Final Environmental Impact Statement for the Powder River Resource Area Miles City District, Montana* (RMP/EIS) (United States Department of Interior Bureau of Land Management

Miles City District Office 1995) and in pages 6-7 of the *Record of Decision* (ROD*)* and *Approved Powder River Resource Approved Plan* Department of Interior Bureau of Land Management Miles City District Office 2000). The RMP/EIS and ROD is available for review at the Miles City Field Office, Miles City, Montana and on line at www.blm.gov/mt/st/en/fo/miles_city_field_office.html. These documents approve fuels management activities including suppression and prescribed fire. The objectives of fuels management are to improve vegetation production, reduce fuel loads, and maintain public safety. In addition, this EA also tiers to and incorporates by information and analysis contained in pages 2 and 105 in the *Fire/Fuels Management Plan Environmental Assessment/Plan Amendment for Montana and the Dakotas* (Plan Amendment) (United States Department of Interior Bureau of Land Management Montana State Office 2003). This Plan Amendment provides for broad levels of fuels treatment including prescribed burns and mechanical (including manual) methods.

This EA addresses the resources and impacts as required by the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, 42 USC 4321 et seq.). The proposed project would not be in conflict with any local, county, federal, or state plans. Rosebud and Custer Counties has prepared Fire Management Plans (Fire Logistics 2005).

1.5 Applicable Legal and Regulatory Restraints and Coordination

Under either alternative, the BLM would comply with the constraints and processes imposed by the following laws, policies, and legal/regulatory agreements, both on this plan and any future site-specific plans that tier to it:

- Endangered Species Act of 1973: Fire suppression, rehabilitation, fuel reduction treatments, and related activities would comply with the Endangered Species Act (ESA) including, but not limited to, Section 7(a) (1) for conservation of species and Section 7(a) (2) for consultation on actions that May Affect species. This shall include consultation on effects from BLM actions or authorizations that may extend onto private, state, tribal, or other land ownership. Section 7 consultations would be completed on this programmatic plan and on any future site-specific wildfire restoration, prescribed burn or fuels reduction NEPA analyses that May Affect listed species or critical habitat.

- Emergency Section 7 Consultation: Federal regulations (50 CFR 402.05) recognize the need for expedited consultation in response to natural disaster (including wildland fire) or other calamity. Where emergency actions (including fire suppression) are required that may affect listed species and/or critical habitats, the action agency shall initiate consultation, usually by phone or facsimile, at the first opportunity. Emergency consultation procedures allow action agencies to incorporate endangered species concerns into their actions during the response to an emergency. Under no circumstance where human life is at stake should an emergency response decision be delayed due to administrative work required by the consultation regulations.

- All site-specific fuels reduction projects would be coordinated with the State Historic Preservation Officer (SHPO) in accordance with the BLM National Programmatic Agreement and Implementing Protocol with Montana SHPO.

• BLM would comply with the provisions of the National Historic Preservation Act of 1966 (NHPA), including Native American consultation, through existing programmatic agreements. In the absence of such agreements, the BLM would adhere to regulations found at 36 CFR 800. Projects subject to the NHPA include fire suppression/restoration activities and fuels reduction projects.

Additional legal and regulatory authorities relevant to this proposed action include:

– The Clean Air Act

– Federal Land Policy and Management Act of 1976

– Archaeological Resource Protection Act of 1979

– Executive Order 12898 (Environmental Justice)

– American Indian Religious Freedom Act of 1978

– Native American Graves Protection and Repatriation Act of 1990

– Resource Conservation and Recovery Act of 1976

– Comprehensive Environmental Response, Compensation, and Liability Act of 1980

– Safe Drinking Water Act of 1974, as amended

– Clean Water Act of 1977, as amended by the Water Quality Act of 1987, including total maximum daily load (TMDL) requirements
– Migratory Bird Treaty Act of 1918

– Executive Order 13186 (Implementation of MBTA, 2001)

– Migratory Bird Conservation Act of 1929

– Fish and Wildlife Coordination Act of 1934

– Bald and Golden Eagle Protection Act of 1940

– Executive Order 11990 (Protection of Wetlands)

– Wild and Scenic Rivers Act of 1968, as amended

– Wilderness Act of 1964

– Lacey Act, as amended (invasive/nonnative species)

– Federal Noxious Weed Act of 1974, as amended

– Executive Order 13112, Invasive Species

– Executive Order 13443(BLM) - Facilitation of Hunting Heritage and Wildlife Conservation

– Executive Order 13007 for Native American Access and Ceremonial Use on Federal lands.

Additional Relevant BLM policy and Plans/Agreements:

The following policies and plans/agreements typically guide development and implementation of individual projects. These policy documents and agreements are listed here to provide a reference as Fire Management Plans and site-specific project plans are developed.

Standard Operating Procedures and Manual/Handbook Guidance

– Standards for Fire and Aviation Operation (Red Book): Contains procedures for protecting environmental qualities during fire suppression and fuels management activities.

– Air: State regulations and implementation plans as specified in Manual Section 9210 (Fire Planning), and the Montana/Idaho Airshed Group Operating Guide

– Burned Area Emergency Stabilization and Rehabilitation (ESR) Handbook, including the BLM-specific exhibit

– Native American Consultation: Manual 8120 and Handbook H-8210

– OHV: Manual 8340 and State Director memo IM no. MT-2001-004

– Prescribed Fire Management Handbook; Manual 9214

– Special Status Species: Manual 6840 (6840 Policy)

– Visual: Manual 8410, Handbook H-8410-1 and H-8431-01. IB 98-135 and IBLA decision 98-100

– Water: Streamside Management Zone (SMZ) guidance as described in state law (MCA-77-5-301 to 307) and Water Quality Best Management Practices for Montana Forests (BMPs)
– Wilderness and Wilderness Study Areas: Manual Section 1742 and Handbook H-1742-1. Manual section 8500, H-8560-1, H-8550-1. Interim Management Policy for WSAs

– Weeds: BLM Manual 9011, H9011-1 Chemical Pest Control Guidance, and Partners Against Weeds: An Action Plan for the Bureau of Land Management Agreements related to Species Conservation and Recovery: BLM would comply with existing agreements regarding the appropriate Conservation and Recovery Plans or Strategies and/or Memorandums of Understanding (MOUs).

Chapter 2.0: Proposed Action and Alternatives

2.1 The No Action Alternative

Under the No Action Alternative, no management actions would occur to change current vegetation or reduce the fuel loads and corresponding fire behavior. Current management of other resources would continue. Future reactive actions (i.e., salvage harvest, rest of allotments following wildfires, emergency rehabilitation and stabilization following wildfires) may be applied in response to insect, disease, or wildfire events. Suppression of wildfire events would continue under the current policy of immediate response and full suppression.

2.2 Hazardous Fuels Reduction (Proposed Action)

The proposed action is to reduce concentration and buildup of hazardous natural fuels in the project area (See Appendix A) through a combination of mechanical[1], manual[2], prescribed fire[3], biological[4], and/or chemical treatments[5] and follow-up maintenance of these treatments. Areas prioritized for treatments are identified in the Custer and Rosebud County Community Wildfire Protection Plans. BLM would work with the Counties to treat those prioritized areas. Scheduling of treatments and maintenance treatments would attempt to mimic a fire occurrence and frequency of 5-25 years, average fire free period of 6-12 years (Fischer and Clayton 1983; Sneed 2005). Scheduling of treatments would be coordinated with grazing schedules. Treatments would be dispersed across the project area to mitigate potential impacts. No more than 25 % of the total project area would be treated in a calendar year. A schedule of treatments with follow-up maintenance would be developed. These treatments would rely on documented vegetation responses.

In general, it is anticipated that treatments would be implemented by conducting mechanical and manual treatments first, but not limited to. Mechanical and manual treatments would typically be achieved through timber sales, contracting, stewardship contracts or BLM work crews. Slash piles would be burned approximately one year following the cutting treatments. These cutting treatments would be followed by prescribed fire (broadcast burning) approximately two years following the cutting treatment if the need to further reduce fuel loads exists. This 2-year period would allow time for recovery of grass, forb, and shrub species following the cutting treatment. In some cases, cutting treatments may not be appropriate and only prescribed fire (broadcast burning) would be used. Some cutting may occur with prescribed fire to prepare fire lines. Maintenance of the treatment units may use any combination of selective thinning treatments or prescribed fire. Prescribed burning, including the burning of slash piles, would only occur under an approved Prescribed Fire Burn Plan. The use of mechanical and manual treatments and

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1 Mechanical treatment is typically achieved using tracked and rubber-tired vehicles with various attachments (skidders, dozers, timco's and de-limbers, chippers, grinders, etc).
2 Manual mechanical treatments use hand-held power devices (e.g., chainsaws).
3 Prescribed fire treatments may include both broadcast and slash burning.
4 Biological fire treatments may include the use Canada Thistle bugs, Gall and Litura.
5 Chemical treatments may include the control of noxious weeds.

prescribed fire may require an Alternative Practice under the Montana Stream Management Zone law (MT SMZ) if these activities are part of a commercial harvest. However, the intent of the Best Management Practices as well as the Stream Management Laws would be adhered to in all treatments.

Prescribed fire treatments may include both broadcast and slash burning.
Desired Future Conditions: The proposed action was designed to achieve the following Desired Future Conditions:

- Public, private lands and property, and natural resources are at reduced risk from fire hazard.
- Risk to Public and Firefighter Safety is decreased.
- Forested areas are "fire resistant"; when fires occur, they stay on the ground and can be caught with normal suppression response under average weather conditions.
    - Surface fuel conditions limit fire duration and intensity.
    - Forested stands are comprised of fire tolerant ponderosa pine of variable sizes present as individuals and in clumps. Densities of the stands are 1-15 trees per acre on rocky and bare soil areas that tend to produce lower tree densities per acre and 15-45 trees per acre on and soil type and would be applied where soil types indicated a history of development under a forest or forest influence (Natural Resources Conservation Service 2007; ecological site guides); where trees have historically done well indicated by presence of older, larger trees or residual stumps; and where a sustainable forested population could be maintained and managed with minimal thinning or understory burning (See treatment levels).
    - Possibility of fire spread through canopy (crown fire) is reduced, and torching is limited to individual pockets of trees.
- Juniper is limited to patches on areas of rocky and bare ground, and individual trees.
- Increasing the health, vigor, and productivity of the native plant community through the reduction of conifers and corresponding increase in availability of water and nutrients.
- Hardwood draws are composed primarily of shade intolerant hardwoods including green ash, chokecherry, and to some extent cottonwood. Ponderosa pine and juniper are absent or at minimal levels and are not excluding the hardwood species; as such, they do not contribute to increased flammability. It is desirable to increase recruitment and rejuvenation of other important browse and shrub species such as skunkbrush sumac (*Rhus trilobata*), and others within riparian and/or upland areas.
- Retention levels for Coarse Woody Debris (CWD), dead material on ground, would be managed at the implementation level.
- Snags are distributed across the landscape to provide wildlife habitat.
- Treatments can be maintained through the application of prescribed fire or additional mechanical, manual treatment, or wildfire.

Roads may be built to access forest products and to enable the access of machinery for treatment. The number of roads and criteria for road building would be determined based on the size and location of the project. Access for BLM and contractors would be negotiated with respective landowners for each project which arises from this environmental assessment. Roads would be evaluated for the need for future use, and some roads may be left as functional roads/trails. All other roads and trails would be mechanically rehabilitated and reseeded as necessary with an appropriate native seed mix. Miles of road to be built for the purpose of removing merchantable

timber would be addressed by treatment area or under another analysis document as needed. The general impacts of road building are addressed under the forestry section of the proposed action. Merchantable material would be offered for sale prior to prescribed fire treatments if feasible; this may include pine and juniper for saw logs, posts, firewood, pulpwood and material for biomass. Slash resulting from the treatment would be chipped, ground, or piled and burned.

Treatment Levels and Treatment Areas (See Appendix D)

Specific Treatment Levels

Level One: Fire Breaks would be developed in portions of BLM lands closest to structures, crops, and infrastructures. A minimum fire break of 30 feet up to 120 feet would be created depending on slope, aspect, and fuel type. Conifers would be thinned to leave 3-15 trees per acre (TPA), with a spacing of 50-90 feet between individual trees or clumps of trees. A variety of age and size classes would be left to assure diversity in the remaining stand population. Manual and mechanical thinning and shredding, commercial sales, post and firewood sales, biomass utilization and prescribed burning are potential tools to achieve this treatment. Slash would be burned, chipped, or ground. There should be minimum use of pile burning due to long lasting effects on soil chemistry and structure, soil seed banks and soil microbial communities due to extreme heating over long time periods. Piles should be located on bare ground or rocky areas to minimize the extent of soil damage and subsequent invasion of non-native weeds.

Level Two: Conifers would be thinned to leave 1-15 TPA. A variety of age and size classes would be left to assure diversity in the remaining stand population emphasizing maintenance of existing clumps to encourage open interspaces. Emphasis should be focused on thinning from below to remove ladder fuels. This treatment would be applied to rocky and bare soil areas and could be used on other areas that tend to produce lower tree densities per acre. Treatment tools listed in Level One would also be used here.

Level Three: These treatments would be based on aspect and soil type and would be applied where soil types indicated a history of development under a forest or forest influence (Natural Resources Conservation Service 2007; ecological site guides); where trees have historically done well indicated by presence of older, larger trees or residual stumps; and where a sustainable forested population could be maintained and managed with minimal thinning or understory burning (e.g., north and east slopes well away from structures and developed sites). Post-treatment densities would be 15-45 TPA with a diversity of age and size classes emphasizing maintenance of existing clumps to encourage open interspaces; however, in stands where individual trees indicate good genetic characteristics (tree shape, lack of disease/infestations) and adequate site potential (aspect or soil types that allowed for higher tree densities), a higher number of TPA would be left. Emphasis should be focused on thinning from below to remove ladder fuels. Treatment tools listed in Level One would also be used here.

Level Four: (Stream channels, drainages and hardwood draws): Fuels Treatment Only: 1.) All hardwoods would be left in place. Up to 70% of dead hardwood stems would be removed to reduce burnable fuel. Percentage would be identified by the Interdisciplinary (ID) team during treatment unit layout; 2.) Conifers present along drainages on slopes over 30% would be thinned

manually to leave 6-foot spacing between the crowns leaving a diversity of age and size classes. Other conifers, not including older conifers of pre-settlement origin, present on areas with slopes less than 30% within the hardwood areas and SMZs would be severed, hand-piled, and burned to enhance hardwood recruitment. Piles would not be constructed directly in drainage bottoms unless they can be located on bare ground or gravel. Where flat areas are not present, and it is not practical to build piles outside SMZs, broadcast burning may replace piles in order to avoid high intensity impacts in drainage bottoms. Alternative practices for the removal of sub-merchantable trees from SMZs, and for broadcast burning in SMZs may be required if these activities coincide with commercial harvest. Independent fuel treatments in these areas would be limited to manual treatment methods with broadcast burning and minimal pile burning.

Depending on erosion potential within SMZs and ephemeral draws, large woody debris may be added to the channel. The ID team would determine the channels/draws that need wood placement during the treatment unit layout prior to and review post treatment. Depending on the amount of large woody debris needed, trees needed for wood placement may be marked for this purpose.

Level Five: (Sub-Merchantable Timber): Sub-Merchantable trees, less than 8 inches DBH, may be severed manually or mechanically. Non-commercial trees (trees without minimum 8 foot saw logs) may be cut. Remove some sub-merchantable trees so that crown spacing is 10-15 feet emphasizing maintenance of existing clumps to encourage open interspaces. Pile severed trees and make them available for biomass utilization, posts, or firewood. Mechanical or manual methods combined with other slash utilization methods would be used in these areas for initial treatments. Areas treated may be maintained with thinning or broadcast burning.

Level Six: (Fire Salvage Areas): Remove majority of dead, merchantable trees greater than 6 inches DBH as firewood, saw logs, post, or biomass Slash generated from harvest could be piled and burned if not utilized for biomass within one year of implementation (removal of trees). Piles should be kept small to minimize the extent of soil damage and subsequent invasion of non-native weeds. Thin live trees to densities of 1-15 TPA on south and west aspects and 15-45 TPA on north and east aspects leaving a diversity of age and size classes with good genetic characteristics (tree shape, lack of disease/infestations) as seed sources. Mechanical or manual methods combined with other slash utilization methods would be used in these areas for initial treatments. Areas treated may be maintained with thinning or broadcast burning.

Level Seven: (No Treatment): Due to the resource or vegetation concerns, these areas would receive no treatment under this document. Emergency Stabilization and Rehabilitation standards and methods for these areas are included in this document should these areas burn under a wildfire. Examples may include areas near a raptor nest, grouse lek, deer thermal/hiding cover, cultural, etc.

Level Eight: (Prescribed Burning): Implement broadcast burning and a limited array of site preparation, including fuel reduction techniques. Site preparation for prescribed burning includes fire line construction, hand thinning, and some snagging. Fuel reduction would be performed in advance of prescribed burning to reduce the potential for an escaped burn and to reduce impacts to air quality from smoldering material following prescribed burning. Material would be removed

through chipping and broadcast burning or piled and made available for biomass utilization, posts, or firewood.

Design Features

The following measures are included in the Proposed Action:

1**.** Mitigation measures for cultural resources would include inventory/survey; avoidance of NRHP-eligible resources; avoidance and or repatriation of NAGPRA-related resources (if any); use of manual treatment methods, and careful application of fire in the vicinity of archaeologically sensitive areas prior to treatments. In addition, further consultation between BLM and the State Historic Preservation Office (SHPO) regarding the existing site inventory, prior to the undertaking, would be conducted in order to accurately define the existing inventory of eligible resources. Reevaluation of sites that would be recommended as needing further work in 1997 should also be clarified and (as merited) addressed. Finally, since historic sites have been documented during previous surveys, archival research and review of historic map data would be used to establish baseline data to mitigate impacts to perishable historic sites within the proposed burn areas.

2**.** Maintenance treatments would be implemented to maintain the desired condition as necessary and funding is available in the form of mechanical and or prescribed fire treatments. A suppression organization which is able to quickly respond to fires in the area would be maintained. Work would continue with private landowners, County and State partners in the area to assist them with treatment of fuels on private lands.

3. Rights-of-way may be utilized during the application of prescribed fire, mitigation measures would be developed for protection of structures.

4. Coal seams would be surveyed and avoided in the application of prescribed fire treatments.

5. Vehicle traffic would be limited to minimal levels to reduce soil compaction. Vehicle traffic would be limited or eliminated when soils are wet to reduce compaction and rutting. On steep slopes, vehicle traffic would be limited to minimize limit erosion.

6. Treatment areas would be monitored for noxious weeds 3 to 5 years after project is completed. Herbicides would be applied according to the label, should they be required for control of noxious weeds.

7**.** Timing stipulations or disturbance free buffer areas would be established around critical habitat areas including raptor nests, active sharp-tailed grouse and sage grouse leks, and others if needed. These restrictions would be imposed as mitigation to facilitate long term maintenance of these and other species populations within this area. Consultation would occur at the project level with the Montana Department of Fish, Wildlife, and Parks (MTFWP) to ensure project planning is consistent with MTFWP goals, and with the United States Fish and Wildlife Service (USFWS), if necessary.

8. Disturbance would be minimized. Total soil disturbance (roads, landings, constructed skid trails, and primary skid trails) would be limited to less than 15 percent of the total treatment area.

9. Equipment would not operate on slopes over 40 percent, except on short lengths where approved by the BLM.

10. Temporary roads and landings would be reseeded and water-barred when project is completed. Portions of temporary roads would be ripped prior to reseeding where the slope exceeds 7 percent, for 50 feet upslope of waterbars, and for 50 feet on either side of draws. An approved native seed mix would be used (certified weed seed free, at the appropriate pure live seed ratios, seeding rates, and applied at the appropriate time).

Chapter 3.0: Affected Environment and Environmental Impacts

The following resources subject to protection by additional environmental laws or regulations were not present in the project area: Hazardous Waste, Wild/Scenic Rivers, Wilderness, Prime/Unique Farmlands, Areas of Critical Environmental Concern, Flood Plains, Environmental Justice, T&E Species (Plants and Animals), Socio-economics and Water Quality (Drinking and Ground). Because these resources were not present in the project area, they are not evaluated in this chapter (Chapter 3.0).

Air quality, cultural resources, Native American Religious Concerns, Wetlands/Riparian Zones, and Invasive Non-native species are further evaluated in this chapter (Chapter 3.0).

3.1 Topography: The project area is divided into 5 topographic zones: Forested areas on north and east aspects, Rough Breaks, Mixed prairie grasslands, croplands, and Woody draws that can contain riparian areas. Slopes vary from 2 to 60 percent. Average slope is 10 to15 percent and slopes are short in length. The low elevation is approximately 2400 feet, and the high elevation is approximately 3300 feet above sea level. The BLM lands, which are the subject of this EA, are typically located in uplands areas.

3.2 Climate: The climate is semi-arid continental characterized by extreme weather variations on a yearly, seasonal, and daily basis. Average precipitation is 10-19 inches during a calendar year but can vary as much as 15 inches from one year to the next. About 20 percent of the precipitation falls during the winter with 30-50 inches of snowfall annually. Mean annual temperature is 45 degrees F. Temperatures are generally lowest in January with an average low of 8 degrees F and highest in July with an average of 90 degrees F. Subzero temperatures of -40 degrees F and highs of 100 plus degrees F have been observed. Relative humidity averages 60 percent but is considerably drier in the summer months. Lows in the single digits are not uncommon.

3.3 General Vegetation: Approximately 37 percent of the project area has forest cover dominated by Ponderosa pine (*Pinus ponderosa*). Upland woodlands, dominated by Rocky Mountain Juniper (*Juniperous scopulorum*) cover 32 percent of the area. Grassland cover type occurs over 26 percent of the area. Five percent of the area is woody draw/riparian, with chokecherry (*Prunus virginiana*), green ash (*Fraxinus pennsylvanica*), and cottonwood (*Populus* sp.).

Generally these areas are dominated by conifers, and understory vegetation normally found in woody draws is shaded out or otherwise being excluded. In pre-fire suppression times, juniper was likely found in areas with poor soils, steep slopes, and rock, which currently comprise two percent of the area. Plants that can grow on this cover type include scattered grasses, skunkbush sumac (*Rhus trilobata*), juniper and pine.

3.4 Forest Vegetation

Forest Habitat types (Pfister 1977) present are:

- *Pinus Ponderosa/Agropyron spicatum (PIPO/AGSP; Ponderosa pine/bluebunch wheatgrass).* PIPO/AGSP is widespread, constituting approximately 60 percent of the forested area, where it apparently represents the driest conditions within the Pinus ponderosa series. Ponderosa pine (*Pinus ponderosa*) series and Rocky Mountain juniper (*Juniperus scopulorum*) are the only successful coniferous trees. Grassland forbs and minor amounts of shrubs accompany bluebunch wheatgrass (*Agropyron spicatum*) in the undergrowth, including; big sagebrush (*Artemisia tridentate wyomingensis* and *vaseyana*), fringe sagewort (*Artemisia frigida*), silver sagebrush (*Artemisia cana*), Skunkbush sumac (*Rhus aromatica*), green and rubber rabbitbrush (*Chrysothamnus nauseosus*), and winterfat (*Ceratoides lanata*).

- *Pinus Ponderosa/Festuca idahensis (PIPO/FEID; Ponderosa pine/Idaho fescue)*: PIPO/ FEID represent approximately 30 percent of the forested area. Present on slopes with better soil development or areas less droughty than PIPO/AGSP. Associated species are similar of those of the PIPO/AGSP with the exception of chokecherry (*Prunus virginiana*) and golden current (*Ribes aureum*).

- *Pinus Ponderosa/Symphoricarpos albus (PIPO\SYAL; Ponderosa pine/snowberry*): PIPO/SYAL is present but uncommon on north-facing slopes, where the stand exhibited closed canopy with relatively uniform stands. Undergrowth is accompanied by a rich assortment of perennial forbs and grasses. PIPO/SYAL represents approximately 10 percent of the forested area.

Forest Vegetation Impacts

No Action:

Little or no management of forest vegetation has occurred in these timbered areas. Current stand density and description on average by aspect is listed in Appendix B. In general, the density of trees has increased over time and increased competition for available water and nutrients. During recent drought cycles, additional stress has been placed on trees, which increases their vulnerability to mortality by insects (further contributing to available fuel loads). Conifer species have also been "encroaching" into former openings (e.g., meadows) and areas of former range vegetation. The amount of juniper in the understory has increased as a result of increased stand density (increased shade) and the lack of fire. In many areas, juniper has excluded the understory of shrubs, grasses, forbs, and other tree saplings (juniper is alleopathic, meaning that it out- competes other plants by shading them out and developing a needle layer which inhibits other plant growth through inhibitory substances in the needles and accumulation) (Jameson, D.A., 1970). Juniper contains volatile oils and is also highly flammable; it acts as a "ladder fuel," which could enable fire on the surface of the ground to climb up adjacent trees into the canopy. The Fire Effects Information System listing of juniper describes the presence of juniper as a component of a climax or high seral stage Ponderosa

Pine forest. High seral stage Ponderosa pine can be susceptible to disturbance through insect infestations or stand replacing fire.

Proposed Action:
Under the proposed action, forested stands would be comprised of fire tolerant ponderosa pine of variable sizes present as individuals and in clumps. Densities of the stands would be 1-15 trees per acre on rocky and bare soil areas that tend to produce lower tree densities per acre and 15-45 trees per acre on soil types where trees have historically done well as indicated by presence of older, larger trees or residual stumps; and where a sustainable forested population could be maintained and managed with minimal thinning or understory burning.

Juniper would be limited to patches on areas of rocky and bare ground, and individual trees. Hardwood draws would be composed primarily of shade intolerant hardwoods including green ash, chokecherry, and to some extent cottonwood. Ponderosa pine and juniper would be absent or at minimal levels in the draws. There would be increased recruitment and rejuvenation of other important browse and shrub species such as skunkbrush sumac (*Rhus trilobata*), and others within riparian and/or upland areas

Temporary roads and landings would be reseeded and water-barred when project is completed. Portions of temporary roads would be ripped prior to reseeding where the slope exceeds 7 percent, for 50 feet upslope of waterbars, and for 50 feet on either side of draws. An approved native seed mix would be used (certified weed seed free, at the appropriate pure live seed ratios, seeding rates, and applied at the appropriate time).

3.5 Range Vegetation

Other major species present in the project area include western wheatgrass (Agropyron *smithii*), prairie junegrass (*Koelaria cristata*), blue grama (*Bouteloa gracilis*), needle-and-thread (*Stipa comata*), green needlegrass (*Stipa viridula*), buffalograss (*Boutaloa dactoides*) and little bluestem (*Schizachyrium scoparium*), big sagebrush (*Artemisia tridentata wyomingensis* and *vaseyana*), silver sagebrush (*Artemisia cana*), skunkbush sumac (*Rhus trilobata*), fringe sagewort (*Artemisia frigida*), green and rubber rabbitbrush (*Chrysothamnus nauseosus* and *vicidiflorus*), and winterfat (*Ceratoides lanata*) dominate the shrub and shrub-like components.

Dominant range sites within the project areas are *Silty 15-19*, *Thin Silty 15-19*, *Thin Silty 10-14*, and *Silty 10-14*. The ecological site descriptions are summarized below. Percentages listed are for the range areas, i.e. non forested and non-riparian.:

- Silty 10-14": Approximately 25 percent of the area. Predominant Species found are: blue-bunch wheatgrass (*Agropyron spicatum*), western wheatgrass (*Agropyron smithii*), and green needlegrass (*Stipa viridula*). Trees are not significant on this site. Annual production of grasses varies from 840 lbs/acre to 1760 lbs/acre with annual precipitation; 75 percent of annual production by weight is from grasses; 5-15 percent is from forbs; and 1-5 percent is from shrubs, half-shrubs and cacti. Slopes are 0-15 percent mainly less than 8 percent. Aspect is not significant as this range site is common to drainage bottoms and gentler side slopes.

- Thin silty 10-14 (approximately 17 percent of the area), Thin Silty 15-19 (approximately 15 percent of the area), and Silty 15-19 (approximately 8 percent of the area) are the same as Silty but

production and species frequency varies with soil depth and precipitation rates.

Range sites which occur within the project areas, at smaller percentages (estimated less than 8 percent):

- Very Shallow 10-14: Predominant grasses are bluebunch wheatgrass, little bluestem, and sideoats grama (*Bouteloua curtipendula*). Annual production of grasses varies from 176-490 lbs/acre. Between 60 and 70 percent of annual production is from grasses and sedges, 1-5 percent is from forbs, and 20-25 percent is from shrubs and half-shrubs. Aspect varies and can be important as this range site is commonly on ridges and shoulders of hills. Slope is 2-70 percent.

- Clay 10-14: Predominant species found are green needlegrass, western wheatgrass, and bluebunch wheatgrass. Annual production from grasses is 560-1600 lbs/acre. Between 65 and 80 percent is from grasses and sedges, 5-10 percent is from forbs, and 5-10 percent is from shrubs. Aspect is not as important of a factor since this range site is common in sedimentary plain, fan, and terrace. Slope is 0-15 percent, most less than 8 percent.

- Shallow 10-14: Predominant species found are: bluebunch wheatgrass, prairie sandreed (Calamovilfa longifolia), and littlebluestem (Schizachryrium scoparium). Dominant shrub is Skunkbush sumac followed by winterfat. Ponderosa pine may occur on this site. Annual production of grasses 350-910 lbs/ac. Between 60 and 70 percent of annual production is from grasses and sedges, 5-10 percent is forbs, and 10-20 percent is shrubs and half shrubs. This range site can be found on all aspects. Slope is 0-60 percent.

- Sandy 10-14": Predominant species found are Big bluestem (*Andropogon gerardi*), Prairie sandreed (*Calamovilfa longifolia*), Sand bluestem (*Andropogon hallii*). Annual production is 675-1800 lbs/acre: 70-75 percent of annual production is from grasses, 10-15 percent from forbs, and 5-10 percent is from shrubs and half-shrubs. Aspect is not significant. Slope is 0-15 percent but mainly less than 8 percent. Trees are not significant on this site.

- Shallow to Gravel 10-14": Predominant species found are: bluebunch wheatgrass, little bluestem, and needleandthread grass (*Stipa comata*). Annual production of grasses is 360-960 lbs/acre: 70-80 percent of annual production is grasses and sedges, 10-15 percent is from forbs and 1-5 percent is from shrubs and half-shrubs. Aspect is not significant as this range site is common in stream terraces, knolls, outwash plain, high flood plain steppe, and terrace escarpments. Slope is 0-45 percent, mainly less than 15 percent.

- Shallow Clay 10-14": Predominant grasses are western wheatgrass, green needlegrass, and bluebunch wheatgrass. Annual production varies from 337-825 lbs/acre: 70-75 percent is from grasses and shrubs, 5-10 percent from forbs, and 5-15 percent from shrubs and half-shrubs. Aspect varies and can be significant as this range site is commonly in sedimentary plain, hill, and escarpment. Slope is 0-70 percent.

- Clay Pan 10-14": Predominant grasses are western wheatgrass, green needlegrass, and alkali sacaton (*Sporobolus airoides*). Annual production of grasses varies from 400-880 lbs/acre: 70-80 percent of annual production is from grasses and sedges, 1-5 percent from forbs, and 2-10 percent from shrubs and half-shrubs. Aspect is not significant as this range site can be found on plains, fans,

and terraces. Slope is 0-15 percent, but is mainly less than 8 percent.

- Gravel 10-14": Predominant species found are bluebunch wheatgrass, little bluestem, and plains muhly (*Muhlenbergia cuspidate*). Annual production of grasses varies from 200-560 lbs/acre: 70-80 percent of annual production is from grasses, 5-10 percent from forbs, and 5-10 percent from shrubs and half-shrubs. Aspect is not significant. Slope is from 0-70 percent.

- Saline Upland 10-14": Predominant grass species found are alkali sacaton, western wheatgrass, and inland saltgrass (*Distichlis stricta*). Annual grass production is 100-400 lbs/acre: 40-50 percent of annual production is from grasses and sedges, 1-5 percent from forbs, and 35-45 percent from shrubs and half-shrubs. Aspect is not significant. Slope is mainly less than 20 percent, however, can be up to 35-40 percent.

Range Vegetation Impacts
No Action:
Conifers have been encroaching on rangelands. Timber would continue to increase in density and shade out range forage plants. The threat of a severe wildfire would remain and wildfire could result in large areas of vegetation being destroyed without the opportunity to mitigate effects.

Proposed Action:
Range vegetation would be disturbed and destroyed from equipment traffic, road building and/or burning depending on which treatment was selected for a particular parcel. These impacts would be short term and range forage plants would recover in one to two growing seasons. As tree density is reduced there would be opportunity for herbaceous plants to increase.

3.6 Riparian Vegetation/Areas

Riparian areas are found within the woody draw portions of the project area. Based upon the USGS's National Hydrology Dataset (NHD) dataset, there are 242 miles of "STREAM/RIVER" within the Wildhorse project area. Most of these drainages are ephemeral in nature, and do not support riparian vegetation. Those drainages which are perennial or intermittent may support riparian vegetation. Perennial and intermittent streams within the project boundary (streams which flow continuously for periods of at least 30 days (Prichard et al., 1998) include Sweeney Creek, and Graveyard Creek; however the main stems of neither of these streams are located on BLM. These riparian areas are associated with riparian woodland, dominated by green ash (*Fraxinus pennsylvannica*), plains cottonwood (*Populus deltoides*), Ponderosa pine (*Pinus ponderosa*) and Rocky Mountain Juniper (*Juniperus scopulorum*), as well as, small pockets of riparian shrubs, dominated by Chokecherry (*Prunus virginiana*) and golden current (*Ribes aureum*). All contain a mixture of riparian vegetation, including sedges, forbs, and grasses. Juniper and ponderosa pine are encroaching into the majority of riparian corridors, and replacing hardwoods and shrubs such as green ash, chokecherry, and other native species. This results in lower vigor, productivity, recruitment, and health of these vegetative species, thereby creating a higher risk from severe burning/heating should a wildfire occur.

Riparian Vegetation/Areas Impacts
No Action:
Riparian vegetation would continue to be replaced by juniper and ponderosa pine. The risk of severe burning/heating to riparian vegetation from wildfire would continue to increase.

Proposed Action:
Green ash, chokecherry, and other native riparian species would increase. These species would sustain higher vigor, productivity, recruitment and health.

3.7 Special Status Plants

There are no federally listed threatened or endangered plant species known to be in the project area. No locations of any plant species of special concern are known to occur in the project area. However, habitat for three plant species of special concern could possibly occur within the project area. Persistent yellow-sepal (*Rorippa calycina*) occurs on riverbanks and shorelines. Bractless mentzelia (*Mentzelia nuda*) occurs on sandy or gravelly plains. Slender-branched popcorn flower (*Plagiobothrys leptocladus*) occurs in drying mud on shores of ponds in the plains and foothill zone. BLM has listed all three species as Sensitive.

Special Status Plants Impacts
Impacts to the three plant species of special concern are unlikely. Although the project area boundary may include habitat for the three species, treatments would not be implemented in areas of suitable habitat for the three plant species of special concern.

3.8 Noxious Weeds

Currently there are no known infestations of noxious weeds within the project area. Infestations of Sulphur cinquefoil (*Potentilla recta*) and Canada thistle **(***Cirsium arevense*) occur in the Wildhorse Subdivision which is adjacent to portions of the project area. Spotted knapweed *Centaurea maculosa*) infestations have been treated in the Wildhorse Subdivision area (A. Adler, Rosebud County Weed District, personal communication**)**. However, any type of disturbance especially fire, is a prime event for noxious weeds to invade.

3.9 Vegetation Impacts: General Discussion

No Action: All stands of timber would continue to be at risk from wildfire. Competition for available nutrients and water would continue as the densities of the stands continue to increase. Continued stress on the trees during periods of drought would result in the decreased ability to resist insects and disease. Additional dead trees would result in the continued buildup of fuels and corresponding higher flammable fuel load.

For other forms of vegetation, the continued pattern of plant growth and loss of distribution would continue under the No Action alternative. As the density of the stands continue with elevated levels, competition for available nutrients and water will continue to exist. Vegetation that is currently decadent would remain so and possibly increase, retaining nutrients and available water that would be made available through consumption by fire or other disturbance which releases nutrients or starts decomposition.

Proposed Action: General Discussion
Mechanical, manual and prescribed fire treatments would cause short term soil exposure which likely would result in short term soil erosion from wind and water. Compaction of the soil would occur from equipment travel. The mixing of mineral soils under current areas of needle cast and duff would result

in establishment of ponderosa pine seedlings, grasses, shrubs and possibly noxious weeds. Competition for available water and nutrients would be reduced in the short run interval until these seedlings and other plants become established, which would favor the trees that are left. Some windthrow of leave trees is likely to occur as the profile of the existing timber stands are changed as a result of harvest and thinning operations. Flammability of the stands would be reduced and the fire resistant Ponderosa pines would be favored. Piling of material (slash) could kill vegetation present under the pile as well as become a site for the establishment of noxious weeds after burning of the pile. Areas where forest products are not being harvested, thinning and prescribed burning activities would occur to reduce the amount of fuel loading. In areas of forest product removal, the streamside management zone (SMZ) law and rules would be followed. An exemption may be requested from MT DNRC for a site specific alternative practice. Over the long term, grasses, shrubs and forbs would be expected to show increased vigor and biomass, which could create more available forage and browse. This increased supply of forage and browse would increase the amount of available fine fuels.

Roads: Road building may result in soil erosion, silting of drainages and riparian areas and possible establishment of noxious weeds.

Slash Piles and Log Decks: Piling of material (slash) can kill vegetation present under the pile as well as become a site for the establishment of noxious weeds after burning of the pile. Construction of large slash piles could cause short term damage through soil compaction, loss of soil micro-organisms, and damage to surface vegetation, rutting and minor wind and water erosion. High temperatures resulting from the burning of piles could result in soil sterilization and the creation of hydrophobic soils (i.e. soils that cannot admit water). Pile sites may be ripped and seeded as necessary after treatment and monitored for the establishment of noxious weeds.

3.10 Forestry

Existing Condition

Removal of commercial and sub-merchantable material is allowable for the purpose of reducing fuel loadings (U.S. Bureau of Land Management 2003). There have not been any permits issued for firewood, posts, poles, or Christmas trees in the project area. The Blue Moon Salvage sale removed 155,000 board feet of timber on Moon Creek 4N, 45E, and the west ½ of S14. Mechanical thinning for firewood, posts, and poles as wells as burning of machine slash piles were undertaken for the Moon Swain project in 4N, 45E, S14 and S24.

Forestry Impacts

No Action

Future reactive actions (i.e., salvage harvest, rest of allotments following wildfires, emergency rehabilitation and stabilization following wildfires) may be applied in response to insect, disease, or wildfire events. Suppression of wildfire events would continue under the current policy of immediate response and full suppression.

Proposed Action

The proposed action is to reduce concentration and buildup of hazardous natural fuels in the project area through a combination of mechanical, manual, and/or prescribed fire treatments and follow-up maintenance of these treatments.

The reduction of the current conifer population density would result in the change of vegetation and the eventual establishment of pine and juniper regeneration. Leave trees should prosper from the increase of available nutrients and water. There is likely to be some windthrow as a function of post-treatment densities. Fire intensities would be diminished which would allow for more survivability of existing trees. In the past ten years approximately 17 timber sales have occurred on private and state land in the projects area (15 private, 1 state, and 1 BLM). These sales have removed approximately 12 million board feet on the state and private and 155,000 board feet on the BLM. These timber sales have generally consisted of overstory removal or selection harvest and have not dealt with fuels other than the slash generated from harvest (C. Pileski, MT DNRC Forester, personal communication).

The proposed action and other timber harvests would mitigate, in part, the encroachment of conifers on rangelands that has apparently been occurring on the past 100 years (C. Pileski, MT DNRC Forester, personal communication). The proposed project area is a relatively small component of the conifer forests in the region and would have little impact on their sustainability or areal extent.

3.11 Fuels/Fire Ecology/Fire History/Fire Regime and Condition Class:

Existing Condition: Fires occur regularly throughout the project area. Early day journals indicate regular burning by Native Americans and the military use of fire by Native Americans and the U.S. Cavalry during operations following the Battle of the Little Bighorn in 1876 (K. Brauneis, 2004). During the last 20 years, 20 fires have occurred on BLM administered lands. In that time 36,482 acres have burned. Fires can occur yearlong but generally occur between April and October. In 1996 the Rosebud fire burned 27,000 acres and is the largest to date. Much of the burned timber in this area is beginning to fall. Several of the recent fires have been human-caused. Many of the fires in the last several years have burned actively and threatened structures (The Rosebud Creek fire of 1996, Moon Creek fire of 2003, Graveyard Creek fire of 2004, North Miller Creek fire of 2004 and the Well fire of 2004 all threatened structures. The Well fire and the North Miller creek fire were human caused.).

Grass, duff, shrubs, Juniper, Ponderosa pine regeneration and down/dead woody material are all primary carriers of fire. Fuels in the project area are continuous, both vertically and horizontally. Fire Behavior Prediction System Fuel Models (FM) 1, 2, 9, 10, 11 and 12 are present in the project area (Anderson, 1982). In the areas of previous burns, down and dead woody (DDW) material is as high as 26 tons per acre. Across the project area, forested acres hold an average of 17 tons per acre of down and dead woody material, and hold as high as 26 tons per acre on north slopes. Based on these characteristics, an active crown fire is quite possible under the current fuel conditions on an average July or August day. Large fire growth is also a likely outcome; during the past two years, six fires with potential to threaten or burn structures and grow beyond the capability of local suppression forces to suppress, have occurred in the project area (BLM fire reports 1981 - 2004).

The project area falls into Fire Regime Condition Classes (FRCC) 2 (Hann and Bunnel, 2001) and 3 (MCFO FMP, 2004). The fire regime is high frequency (Fischer and Clayton, 1983 Fire Groups 2 and 3) and would normally host fires of low intensity. Fires of high intensity can be expected due to the high amount of fuel loading which have resulted from a combination of limited timber harvest and fuels management, drought, lack of frequent fire and possibly overgrazing which may have reduced competition to pine seedlings from grass. These conditions have allowed juniper and pine to increase in density. Probably the element of this combination with the largest affect is the lack of frequent fire (Burkhardt, 1976). Juniper, when present in high densities such as found in the project area, indicate

an abnormal condition on sites other than those located in rock outcrops or on poor soils and bare ground where fire would have a difficult time spreading. Juniper is quickly eliminated by fire. Research catalogued in the Fire Effects Information System chapter on juniper indicates that juniper is part of the later seral stages or climax of Ponderosa pine forests. Essentially the area has missed from one to three normal fire cycles and the fuels have built up accordingly. Key components of the ecosystem such as green ash are beginning to depart. The most visible example of this is the dominance of conifers, mostly juniper in many of the woody draws.

Fuels/Fire Ecology/Fire History/Fire Regime and Condition Class Impacts:
No Action: Under the no action alternative there would be little overt change in the situation. Timber densities would continue to build up; and key plants of the understory would continue to decline due to competition for nutrients and water. The area would remain at high potential for large fire growth and severe fire behavior. It is likely that new residences would continue to be built on the private lands in the adjacent subdivision. High risk of loss to wildfire and large suppression costs would remain.

Proposed Action: With the treatment of fuels using mechanical, manual, and prescribed fire, wildfires would have less access to ladder fuels which would decrease the amount of torching and crowning when fires do occur. The fuel load is likely to change to finer fuels such as grasses in which fires can spread faster, but the resistance to control and duration of fires would decrease. Existing cattle trails, two track roads, and natural breaks would become more effective at limiting spread; spotting potential would decrease with the change in fuels. Fewer suppression resources would be able to accomplish more fire control in the lighter fuels.

Short term impacts from mechanical treatment and prescribed burning could include soil exposure, increased runoff, possible erosion, increased dust, and some visual impact.

Long term impacts would likely be minimal as vegetation re-establishes. Grass and shrub species would likely increase. One possible long term impact could be the establishment of Ponderosa pine seedlings in high density as a result of the removal of the current overstory. All of these plants in high density can provide a major fuel source which can contribute to fire spread and growth; however, follow-up maintenance treatments would reduce these threats.

Previous wildfires have burned 36,482 acres within the last 20 years on BLM administered lands which averages out to one fire each year within the project area. Generally these fires have burned severely in intensity and with duration of up to a week. The normal fire frequency of Ponderosa Pine forests is suggested to be 5-25 years with a mean fire free interval of 6-12 years for any given acre of land (Fischer, 1983). Historically fire intensities and duration were low and short in more open stands of pine. A cumulative impact of no action would be continued high fire severity and longer duration fires. Risk to Firefighters, residents, and existing resources would remain high and could grow as more structures are built. Potential suppression and burned area rehabilitation expenses would continue to compound as fixed costs rise.

The proposed action would change the existing fuel load and corresponding intensity and behavior of wildfires which occur following treatment. Fuels loads would likely consist of more fine fuels. After a number of years there would be ponderosa pine and juniper regeneration. Fires can move fast in fine fuels but are less resistant to control efforts. The project area would require follow-up treatments to

maintain the post-treatment condition resulting from the proposed action. Rosebud Co. has begun implementing small scale thinning operations around residences in the Wildhorse subdivision. In the past ten years approximately 17 timber sales have occurred on private and state land in the projects area (15 private, 1 state, and 1 BLM). These sales have removed approximately 12 million board feet on the state and private and 155,000 board feet on the BLM. These timber sales have generally consisted of overstory removal or selection harvest and have not dealt with fuels other than the slash generated from harvest (C. Pileski, MT DNRC Forester, personal communication). One fuels treatment of 100 acres was implemented on BLM lands adjacent to the project area as part of the Moon /Swain Hazard Fuel Reduction and Restoration project. Rosebud County has conducted thinning and chipping operations on approximately 20 acres in the Wildhorse subdivision on Cherry Creek. They plan to continue as funds remain available. No other fuels treatment projects are known to have occurred in the project area. Both Rosebud and Custer Counties have Community Wildfire Protection plans in place which list this area as one of concern with treatment recommended.

The MT DNRC plans to harvest about 1.5 million board feet annually (C. Pileski, MT DNRC Forester, personal communication). The U.S. Forest Service plans to harvest 3.5 million board feet in Montana annually (D. Sandbak, Custer National Forest, personal communication). The proposed action and other timber harvests would mitigate, in part, the encroachment of conifers on rangelands that has apparently been occurring on the past 100 years (C. Pileski, MT DNRC Forester, personal communication).

3.12 Wildlife (including Threatened and Endangered Species):

Existing Condition

Ponderosa pine/juniper habitats, sagebrush/grassland habitat, and hardwood draw habitats support a diversity of wildlife within the project area. Large game animals (e.g., mule deer, white-tailed deer, and pronghorn) use these types of habitats, as do fur-bearing mammals (e.g., coyotes, badgers, bobcats, raccoons, and skunks) and other small mammal species.

Upland game birds (e.g., turkeys, sharp-tailed grouse, and sage grouse) also occupy habitat in the proposed project area. Field surveys for sage grouse and sharp-tailed grouse were conducted in 2006 (Ecosystem Management, Inc., 2006). The sage grouse is a BLM sensitive species. No new sage-grouse leks were located. Five historic leks were checked; only one was active. Sage-grouse lek habitat was very poor with encroaching woodlands and anthropogenic fragmentation (roads, houses, power lines, fences, etc.) Nine historic sharp-tailed grouse leks were checked; two were active. No new sharp-tailed grouse leks were located in the survey areas. This project area does not contain prime lekking habitat for sharp-tailed grouse.

A wide variety of avian species including numerous neo-tropical migratory songbirds and several species of raptors inhabit this area. Much of the proposed treatment areas are dominated by a dense overstory of ponderosa pine and juniper dominated primarily by forest-dwelling wildlife species.

Juniper and ponderosa pine are encroaching into the majority of riparian corridors that should contain healthy, diverse stands of hardwoods and shrubs such as green ash, chokecherry, and other native species. This results in lower vigor, productivity, recruitment, and health of these vegetative species, and reduces habitat quality for riparian associated wildlife species native to this area.

No USFWS classified T&E species exist or occupy seasonal or year-long habitat within the planning area. Bald eagles were recently de-listed as a USFWS "threatened" species, and are now considered a BLM "sensitive" species. Bald eagles utilize habitats within the area for hunting, perching, and during migrations. The BLM parcel located within section 12 of the Iron Jaw treatment unit is approximately 1 ¼ miles from an active bald eagle nest, located on the Yellowstone River (Graveyard 1). Prairie dogs, also considered a BLM sensitive species, occupy approximately 167 acres total within all treatment units; however, none exist on public lands. Several other BLM sensitive species, including burrowing owls, ferruginous hawks, and black backed woodpeckers, may use habitat in the area. Although limited, some potential habitat for northern goshawks and peregrine falcons does exist.

Wildlife Impacts:

No Action: If treatments are not completed, the potential for a stand-replacing wildfire would remain high (see Fuels Affected Environment and Impacts section). A severe wildfire could cause direct or indirect mortality to wildlife species from actual heat/burn injury as well as the loss of habitat and displacement.

Proposed Action: Treatments may disturb and displace resident wildlife species. Direct mortality of wildlife species during prescribed burns is uncommon but possible. The greatest potential for wildlife mortality would occur for less mobile wildlife, including young. Some of these potential impacts can be minimized by timing restrictions and/or buffer areas during key time periods for wildlife such as critical nesting periods for raptor species.

Under prescribed fire treatments, a reduction in hiding and thermal cover, nesting cover, brood-rearing and fawning cover, travel corridors, and forage would occur until these areas were re-vegetated, although not to the same extent and duration as if a stand replacing wildfire occurred. Similar habitat existing on adjacent private and state lands would not be receiving the same treatment at the same time, and would offer habitat values during treatment disturbances. Some vegetation, such as chokecherry, silver sage, skunkbush sumac, and species of grasses and forbs may re-sprout shortly after disturbance. Other types of vegetation, such as big sagebrush, may not re-establish to pre-treatment levels for several decades.

Under mechanical or manual treatment scenarios, disturbance and the loss of habitat would be the primary short term effects of this action. Those species likely to be the most affected are the cavity nesting bird species as well as other pine/juniper habitat occupants. Other impacts and responses such as displacement are the same as those listed above. Under mechanical and manual treatment habitat alterations can be more selective than burning i.e. the equipment operator can discriminate between a chokecherry and a pine whereas fire cannot.

Under all treatment scenarios, the resulting increase in open canopies and mosaics would provide additional "edge" habitat, which is valuable for many species. Additional sunlight from the removal of conifers would stimulate browse and shade-intolerant species, increase the palatability and nutrient content of available forage, and increase the recruitment of forbs. Over the long term, the diversity of vegetation would likely increase and the functionality of wildlife habitat would be enhanced, which may increase wildlife species diversity in the area.

Depending on the type of treatment used (e.g., prescribed fire vs. mechanical/manual treatment),

habitat may be created for certain species such as black backed wood peckers, a BLM sensitive species, as well as others. In addition, potential sage grouse habitat may be improved by reducing or eliminating conifer encroachment within these habitat types. Expanses of existing high quality sage grouse habitats would be treated to maintain their high quality for sage brush obligate habitat species.

The treatments proposed would also significantly reduce the potential for extensive loss of habitats to wildfire in the project area. Because the project area is intermixed with state and private lands, actions on public lands would create a mosaic within the landscape. Adjacent private lands may not be affected and would provide somewhat differing habitats for wildlife and both combined would create a diversity of habitats for wildlife. Overall, habitat types may change from forest types to relatively open shrub/grassland types with scattered park-like stands of ponderosa pine and juniper, as well as increased green ash/chokecherry type habitats.

3.13 Livestock Grazing:

Existing Condition

Thirty allotments are located within the proposed project area. See Appendix C for a list of allotments and Animal Unit Months (AUMs). Twenty-two allotments are licensed for custodial grazing, meaning grazing does not exceed the grazing capacity established, but does not specify grazing seasons or livestock numbers. Six allotments have restricted livestock numbers and seasons of use. Grazing is authorized for 3,584 AUMs. Twenty-five different permittees lease these allotments to graze cattle and horses. Two of the allotments have Allotment Management Plans (AMPs). All thirty allotments have been assessed for the five Standards for Rangeland Health. Twenty-nine out of the thirty allotments met the Standards for Rangeland Health.

There are 44 known range improvement projects within the project area. Range improvement projects include 17 reservoirs, 2 wells, 6 pipelines totaling 3.33 miles, 18 fences totaling approximately 20 miles and a corral.

Animal distribution and movement patterns may be limited by the amount and distribution of conifers which also limit the amount of available forage. Fallen timber on allotments with old burns can limit animal distribution and grazing, but also protects hardwood species, which are becoming well established in many places.

Livestock Grazing Impacts:

No Action: Since treatments would not be applied, the potential for a large fire would be the primary source of potential impacts to current grazing activities and conditions. If a fire occurred, permittees would be required to rest burned grazing allotments for up to two years. Animal distribution would continue to be impaired and some range improvements would likely be destroyed or damaged during a large wildfire event. Replacement cost for a mile of fence is estimated from $4,800 to $ 6,400 per mile. Twenty miles of fence on the public domain could total $128,000 to replace. Above ground portions of pipelines and wells are subject to damage from wildfire also.

Proposed Action: Short term impacts could occur during treatment, fences may be broken or damaged, animals could be disturbed, and gates could be left open. Dust would be generated during hauling, which can cause dust pneumonia in cattle. Pastures may need to be rested or grazing deferred before and after burning. Pre-burn rest may be necessary to allow fine fuels to build up in to a level

which would carry a fire. Post-burn rest or deferment may be necessary to allow vegetation to recover. Positive long term impacts are an increase in forage and improvements in animal distribution from the removal/reduction of conifers and dead fall.

3.14 Airshed:

Existing Condition

Air quality is excellent because of sparse populations and limited industrial activity (coal mines and coal fired power generation facilities at Colstrip (25 miles southwest). There is a Prevention of Significant Deterioration (PSD) Class II Air Quality rating present established under the Clean Air Act of 1977. This classification allows some deterioration associated with moderate development and population growth. The nearest federal PSD Class I areas are: The Northern Cheyenne Indian Reservation (60 miles southwest), UL Bend Wilderness (130 miles northwest), Yellowstone National Park (200 miles southwest), and Gates of the Mountains Wilderness (260 miles northwest). The nearest designated non-attainment areas are: Lame Deer (50 miles southwest), Billings and Laurel (100 miles west), Great Falls (260 miles northwest), and East Helena (280 miles northwest).

Air Quality Impacts:

No Action: Short term large scale emissions from wildfires would result if wildfires occurred. Particulate matter (PM) and carbon monoxide are the primary pollutants emitted by wildfires. Particulates 10 microns and smaller (PM_{10}) may be inhaled and pose a threat to public safety and visibility. $PM_{2.5}$ levels persisting in the 40-80 micrograms/cubic meter ($\mu g/m^3$) are considered to be unhealthy for sensitive individuals and exceed the 24-federal standard (Montana /Idaho Airshed Group 2006). A study of air quality in the Missoula Valley during the summer of 2000 found that for the entire month of August, $PM_{2.5}$ concentrations were above the annual $PM_{2.5}$ ambient air quality standard of 15 $\mu g/m^3$ (Ward and Smith 2000). Based on the 2000 fires, $PM_{2.5}$ concentrations, as a 24-hour average, can expect to range between 100 and 600 μg/m3 up to 100 miles from the fire (Story and Dzomba 2005). Impacts to air quality would continue to include combustion engine emissions and fugitive dust from vehicle use on roads and for agricultural practices.

Proposed Action: Treatment would cause short term increases from fugitive dust, combustion engine emissions during manual and mechanical treatments, and smoke during prescribed burns. Impacts to air quality would be temporary and would not last more than 2-3 days for smoke. The project area is located in the eastern Montana zone where there is better smoke dispersal than western Montana where valley inversions, like those in Missoula Valley, are experienced. All prescribed burning is to be done so as not to exceed the Montana or Federal EPA Ambient Air Quality Standard for particulate matter and other pollutants and to not cause or contribute to a new violation of the non-attainment standard (Montana/Idaho Airshed Group 2006). Protection of soils would be reduced in the short term during mechanical and prescribed fire treatments which could result in increased wind erosion and a possible increase in local dust levels. Once vegetation is reestablished, dust levels should return to pretreatment levels. Impacts would be short term in nature and would not last longer than a few days at a time. There are no known existing or other planned activities in the airshed of the project area that are anticipated to comprise air quality standards (D. Walsh, MTDEQ Air Compliance Section, personal communication).

3.15 Hydrology:

Existing Condition

Based upon the USGS's NHD dataset, there are 242 miles of "STREAM/RIVER" within the Wildhorse project area. Of these, 21.2 miles are on BLM surface within the proposed treatment areas.

The majority of these streams are ephemeral in nature (do not flow continuously for periods of at least 30 days (Prichard et al., 1998)). These ephemeral streams would be classified as either ephemeral or Class 3 under the Montana Streamside Management Zone Law and Rules (MT-SMZ law) and include:

- In that portion of the North Miller Creek Treatment Area where detailed stream inventories have been conducted by the BLM, the NHD dataset indicates that 4.7 miles of streams are present on BLM surface. On the ground inventories indicate that there are 3.8 miles of Class 3 streams in this area under the MT-SMZ law. Overall in the North Miller Creek treatment area, the NHD dataset indicates that a total of 7.8 miles of stream are present on BLM surface that would be classified as either ephemeral or Class 3 under the MT-SMZ law.
- Cherry Creek Treatment Area: 0.8 miles on BLM.
- Rosebud Buttes Treatment Area: 4.4 miles on BLM.
- Howard Coulee Treatment Area: 3.3 miles on BLM.
- Snyder Creek Treatment Area: 0.6 miles on BLM.
- Iron Jaw Treatment Area: 4.3 miles on BLM.

Detailed inventory of all stream reaches would be conducted prior to the initiation of a timber sale in a particular area, and the SMZs along identified streams would be protected as required by the MT-SMZ law during commercial harvest activities and mechanical treatment. Identified drainages would be assigned as level 4 treatment units. In some cases, alternative practices may be required in order to remove sub-merchantable conifers from the SMZs, and to allow broadcast burning within the SMZs.

Perennial to intermittent streams within the project boundary (streams which flow continuously for periods of at least 30 days (Prichard et al., 1998)) include Sweeney Creek (25.3 miles), and Graveyard Creek (6.0 miles). Neither of these streams is located on BLM surface. These streams would be classified as either Class 1 or Class 2 under the MT-SMZ law.

The Wildhorse project area drains either directly or indirectly to the Yellowstone River. The western portion of the project area (69.4 mi^2) drains to Rosebud Creek, which flows north to join the Yellowstone River 1.6 river miles upstream of Rosebud, MT. The southeastern portion of the project area (44.9 mi^2) drains to the Tongue River, which flows northeast to join the Yellowstone River in Miles City, MT. The central portion of the project area (88.1 mi^2) is drained by Sweeney Creek, which flows to the north to join the Yellowstone River 7.8 river miles downstream from Rosebud, MT. The northeastern portion of the project area (23.4 mi^2) is drained by Graveyard Creek, which flows to the north to join the Yellowstone River 3.1 river miles downstream from Hathaway, MT. The remainder of the project area (14.3 mi^2) is drained by minor tributaries of the Yellowstone River, including Cottonwood Creek, Iron Jaw Creek, and Butte Creek.

The portions of Rosebud Creek and the Yellowstone River which drain the project area are identified in the Montana Department of Environmental Quality's 2006 Integrated 305(b)/303(d) Water Quality Report as impaired streams (http://www.deq.mt.gov/CWAIC/default.aspx).

For the portion of Rosebud Creek which would be affected by this proposal [Northern Cheyenne Reservation Boundary to an irrigation dam 3.8 mi above the mouth (MT42A001_012)], the probable cause of impairment is identified as "other" while the probable source of impairment is identified as dam construction. TMDL development is ongoing for Rosebud Creek.

For the portion of the Yellowstone River which would be affected by this proposal [Cartersville Diversion Dam to the Powder River (MT42A001_012)], the probable causes of impairment have been identified as alteration in stream-side or littoral vegetative covers, copper, lead, nitrate/nitrite (nitrite + nitrate as N), pH, solids (suspended/bedload), total dissolved solids (TDS), and zinc. The probable sources of impairment have been identified as agriculture, irrigated crop production, rangeland grazing, streambank modifications/destabilization, municipal point sources, post-development erosion and sedimentation, natural sources, and unknown sources. TMDL development is anticipated to being in the Middle Yellowstone Watershed between 2009 and 2012 (http://deq.state.mt.us/wqinfo/TMDL/TMDLSchedule2006.pdf).

Hydrology Impacts: Watershed and riparian disturbances can affect the movement of water and sediment through a basin. Individually or cumulatively these disturbances can adversely affect channel conditions and ultimately beneficial uses.

The location of management activities and the inherent characteristics of a watershed play a large role in determining potential effects to water quality and stream function. In particular, high-risk areas include steep highly erosive slopes that are near streams.

No Action: No treatment would not result in immediate impacts; however the potential for a catastrophic wildfire would be greater. A severe wildfire may result in noticeably increased nutrients, suspended solids, and total dissolved solids (TDS) (Ranalli, 2004). Reclamation projects may be necessary following a severe fire in order to mitigate the effects of erosion in burned areas.

Ranalli (2004) notes that "The magnitude of the difference between pre- and postfire nitrogen concentration and the duration of the postfire concentration increase is dependent upon a number of fire and watershed characteristics". These characteristics include the intensity and severity of the fire (the amount of organic material burned), the amount of wind during the fire, the amount of rainfall following the fire, slope steepness, cation exchange capacity of the soil, timing of the regrowth of vegetation, and burn history." Under a wildfire scenario managers can not control any of these factors. Also, wildfire could not be designed to keep it away from live waters. As such, no action could contribute to the impairment of the Yellowstone River if a severe wildfire occurs, since increases in nitrate/nitrite (nitrite + nitrate as N), pH, suspended solids, and total dissolved solids (TDS) may occur if an intense fire occurs near live waters.

A continued indirect impact of the no action alternative is the retention and transpiration of available water by conifers. This prevents water from recharging aquifers and springs.

Proposed Action: The mechanical and prescribed fire treatments proposed, including the burning of slash piles would remove vegetation and expose soil to erosion in the short term. Manual treatment

would have little impact on soils. Site specific delineation of the treatments to be used would substantially limit the amount of disturbance along drainages and in SMZs. Rehabilitation measures outlined in the Design Features section would reduce the duration of impacts. The presence of intact SMZ areas and undisturbed areas between the areas of disturbance and live waters would also inhibit the introduction of sediment to surface waters. As such, the proposed treatment levels are not anticipated to contribute to the impairment the Yellowstone River via the introduction of suspended sediments, and would not be anticipated to result in noticeable impacts to live waters. In the long term, there would likely be more vegetation present on the area as the conifers are removed and ground surface is exposed to sunlight. More grasses, forbs, and shrubs are likely to grow. Soil erosion would be at or below current levels over the long term.

Fire can produce ash with a high pH, and a high nutrient content. The BLM surface areas that are the subject of this analysis are located at least 0.5 miles from the Yellowstone River, and at least 0.4 miles from any live waters. Since prescribed fire would take place in a particular window of weather conditions, a fire which was severe enough to burn large amounts of organic matter would not be anticipated to occur. Therefore measurable effects to surface waters from nutrients would not be anticipated (Ranalli, 2004). The presence of intact SMZ areas and unburned areas between the areas that would be burned and live waters would also inhibit the introduction of sediment, nutrients, or high pH/high TDS ash to surface waters. As such, the proposed treatment levels are not anticipated to noticeably contribute to the impairment of the Yellowstone River, and would not result in noticeable impacts to live waters. Since this alternative would not affect the presence of the irrigation dam on Rosebud Creek, it would not contribute to its impairment.

An indirect impact of the proposed action would be the increased availability of water for vegetation, aquifer recharge, and springs which would result from removal of conifers.

3.16 Soils:

Existing Condition

The soils in the project area have developed in colluvium and residuum derived from the Tongue River Member of the Tertiary Fort Union Formation. Lithology of these units consists light to dark yellow and tan siltstone and sandstones with coal seams in a matrix of shale. In some areas, the near-surface coals have burned, baking the surrounding rock, producing red, hard fragments (clinker). Differences in lithology have produced the topographic and geomorphic variations seen in the area. Higher ridges and hills are often protected by an erosion-resistant cap of clinker (porcellanite) or sandstone. Soils within the area are distributed according to primary differences in parent material (both residual and depositional), elevation, moisture, and topographic slope and position. Soils are deep (>40 inches) on alluvial fans, basins, and valley alluvium. Shallow soils (<20 inches) occur on plains and ravines underlain by sandstone, siltstone, and shale bedrock as well as in areas with steeper topography. Moderately deep soils are those considered between 20 and 40 inches; these soils generally lie on residual upland plains and relatively gentle sideslopes. Soils are generally productive, though they vary with texture, slope and other characteristics. There are no sodium salts present in large enough amounts to effect plant growth and productivity. Slopes may be as much as 75 percent though are generally 12 to 25 percent.

Soil Survey of Rosebud County Area, Montana (1980) indicates that much of the area is covered by

the Cambert-cherry-cabba silt loams (found on 12-25 percent slopes). These soils are moderately deep, deep and shallow soils with predominantly moderate and slight potential erosion hazards. These soils commonly exist across the landscape in association with the Cherry series which are found on the lesser slopes, the Cambert series on moderately steep slopes and Cabba series on the steeper portions of the project area. Small acreages of sandy loams and clay loam also are found in the project area.

Other soil complexes found in the project area are the Lamedeer-cabba-ringling complex (found on 25-70 percent slopes) and the Armells-cabbart-kirby complex (same slopes). These units cover the steepest parts of the landscape. Lamedeer, Ringling, Armells, and Kirby series have developed in clinker and often cap ridge tops. Soils with sandy loam and clay loam textures are found as inclusions these areas.

On a general basis, soils have surface and subsurface textures of silt loam and fine sandy loam, and generally provide for productive rangelands but are easily eroded and compacted. Soils on steeper slopes have severe potential for erosion and as slope decreases, so does the potential for erosion. Generally soils have low surface organic matter content. Hydrologic groups are predominately C and D indicating high runoff potential, and rutting hazard is high due to low soil strength. This combination of characteristics indicates that off road vehicle traffic may be particularly damaging to the soil surface under high soil moisture conditions and potentially lead to accelerated water erosion during runoff events.

None of the soils in the project area are classified as prime or unique farmland as noted in the National Soils Information System (NASIS) database for the area. There is no flooding or ponding hazard for these soils (NASIS).

Soil Impacts:
No Action: No impacts would result from treatments, since none would be implemented. Not treating the area may result in increased susceptibility to heating and damage from wildfire. Soil nutrient loss from fires occurs through oxidation or volatization of compounds, convection of ash particles, increased leaching losses, and accelerated erosion. Under the current fuel loadings, fires are likely to burn hotter with longer duration than under reduced fuel loads and finer fuels. Increased heat translates to accelerated and increased oxidation and volatization. Fires may increase available phosphorus, exchangeable calcium, and amount of organic matter in mineral soils; nitrogen is reduced due to post burn propagation of nitrogen fixing plant species. Infiltration is likely to decrease and run-off and sediment yield are likely to increase after severe wildfires. Loss of surface organic matter and debris from fire may result in reduced water holding capacity and increased soil erosion by wind and water. An increase in erosion due to raindrop splash and overland flow of water is possible. Soil biota may be decreased or eliminated in the soil surface depending on intensity of the fire. Additional indirect effects occur from nutrient release back to the soils by decomposition. A more productive and diverse vegetative cover as a result of the fire would provide for greater soil protection from erosion and benefit soil health.

Proposed Action: Compaction from equipment, erosion from soil disturbance and soil exposure resulting from equipment use, building of temporary roads, and prescribed fire would occur. Impacts may result in loss of soil productivity, and increased susceptibility of the soil to wind and water erosion. These would be high intensity impacts over a short period of time and a limited geographic

extent. Impacts from erosion to other resources (such as surface water or air quality) are unlikely to be noticeable. Shifts in vegetative communities are unlikely to be noticeable over the long term, given appropriate weed management.

Soil compaction by vehicle traffic results in the collapse of soil pores reducing the transmissivity of water and air. Compaction decreases infiltration thus increasing runoff and hazard of water erosion. The potential for compaction is greatest when soils are wet. Factors affecting compaction include soil texture, moisture, organic matter, clay content and type, pressure exerted, and the number of passes by vehicle traffic or machinery.

Reduction of water and air movement in the soil would limit plant uptake of water and nutrients and affect above ground plant health and growth. Available water capacity would be reduced due to decreased pore space. Reduction of water and air availability would affect soil flora and fauna in the same manner and may ultimately affect above ground plant growth and health. Compaction effects soil temperature, affecting the activity of soil organisms, their rate of decomposition of soil organic matter, and subsequent release of nutrients. The persistence of soil compaction is determined by the depth at which it occurs, the shrink-swell potential of the soil, and the climate. As the depth of compaction increases, compaction would be more persistent. The type and amount of clay determines the shrink-swell potential. The greater the shrink-swell potential and number of wet - dry cycles, the lower the duration of compaction. Freeze - thaw cycles also decrease duration of compaction. In some cases, as along heavily used two track trails, compaction would severely restrict soil transmissivity. Compaction in these areas could be reduced by remedial action, such as plowing or ripping. Compaction could be released naturally over decades of climatic cycles.

Mixing of soil horizons could occur during the project. Mixing could affect productivity of surface flora and effect subsurface flora and fauna. Soil horizon mixing could result where construction of roads or other activities occur. Mixing of horizons could result in moving organic matter and nutrients at depths out of reach of surface plants. Mixing could also bring soluble salts or unweathered material to the surface affecting soil and plant health. Soil flora and fauna could be displaced out of their living zone or exposed to unfavorable conditions and not survive.

Surface flora is often dependent on conditions created by soil organisms and their health and survivability may be impacted. Species composition, above and below ground, may be altered. Horizon mixing may bring soil texture and structure to the surface that are more susceptible to wind and water erosion. Organic and inorganic compounds that hold soil structures together may be exposed to conditions that destroy these compounds or decrease their effectiveness to create stabile soil structure. If soil structure is destroyed, surface infiltration by water and air may be affected. Soil organic matter may be destroyed due to exposure with a loss of available nutrients. Inorganic compounds, such as carbonates and other salts, may be brought to the surface, which effect seed germination, plant health and viability.

Mixing or disturbance of horizons or removal of vegetation would modify the spectral reflectance of a site. This could result in lighter materials being brought to or exposed on the surface resulting in greater reflectance of solar radiation and decreased soil temperature. This would affect soil organism activity, their rate of decomposition of soil organic matter, and subsequent release of nutrients. Decreased temperatures could result in later germination of plants and reduction in plant growth and

production with a reduction in soil protection from erosive forces. Species composition, above and below ground, would be altered due to changes in soil temperature.

3.17 Geology/Minerals:

Existing Condition

The primary geologic formation in the project area is the Tertiary age Fort Union Formation. The Fort Union is made up of three members: they are (in descending order) the Tongue River, the Lebo, and the Tullock Members. The Tongue River Member is the principle coal producing member in the Powder River Basin. The closest coal mine to the project area is at Colstrip about 25 miles to the southwest in Rosebud County. The primary coal seams found in the Tongue River Member are (in descending order): the Rosebud, the McKay, and Robinson. The Rosebud coal seam is mined at Colstrip and it reaches a maximum of 29 feet thick. Coal seams are well known to merge, split, and eventually die out laterally. There has been no specific mapping to determine which coal seams are present in this area. Exposed coal seams are present and constitute an additional workload and hazard should they be ignited during a fire. The coal seams also hold available ground water.

No other minerals or geologic features of significance are known to be present in the project area.

Geology/Minerals Impacts:

No Action: There would be no additional impacts to the geology or minerals from the No Action alternative other than the possible ignition of exposed coal seams during a wildfire event which would require serious effort and expense to extinguish if not caught early.

Proposed Action: Potential impacts to geology and/or minerals would be limited to igniting a coal outcrop from a prescribed fire or slash burning. Treatment areas would be surveyed for coal seams with locations entered in to the known coal seam data base. If a coal seam outcrop was inadvertently ignited they are relatively easy to extinguish when detected early on. The coal fires, if left unextinguished, would impact air quality in the immediate vicinity of the coal fire and could be a potential future hazard.

3.18 Cultural Resources:

Existing Condition

A review of cultural resource data shows that a total of 69 archaeological and historical sites have been recorded in the Wildhorse Project Area. The majority of the sites has been recorded in the Iron Jaw Unit and is principally prehistoric lithic scatters (places where stone tools were made and maintained). Site types in the Wildhorse project include lithic scatters, historic sheepherder camp remains, historic logging camp remains, wood structures, historic and prehistoric cairns, tipi rings, and one burial. The burial was repatriated to the Northern Cheyenne in 1988 and reburied in 1988 pre-NAGPRA. Lithic scatters ranged in age from Paleoindian through more recent times. Site density is variable within the planning area; it ranges from 0 sites per section to 21 sites per section. The range of cultural resources recorded and cultural resource issues are discussed in *A Summary of the Cultural Resources and Cultural Resource Issues in the Wildhorse Hazardous Fuels Reduction Planning Area, Custer and Rosebud Counties, Montana* (Melton, 2005 [revised 2007]).

The Wildhorse area contains sites that are likely eligible for listing on the National Register of Historic Places; however, few eligibility determinations have been made at this time. In addition, Montana SHPO indicated in 1997 that many of the sites may not be individually eligible, but further stated that those sites needed to evaluated in a broader context. There are no data available to suggest that a broader evaluation has been conducted. Although not fully evaluated, data from such sites typically could include information pertinent to our understanding of settlement patterning, land-use, subsistence, and other lifeways for both the historic and prehistoric occupation of the region. Some of the site types, such as wood structures, are vulnerable to fire. Others, such as burials, are extremely sensitive to disturbance. The general preference is to avoid impacts to cultural resources by prior identification. Cultural clearance will be in place before treatment implantation.

The Northern Cheyenne Tribe has expressed concerns over potential impacts to Traditional Cultural Properties (TCPs) that might occur in the project area. Additionally, the project area contains site types that have been identified as being of concern to the Northern Cheyenne and Crow Tribes. Prior to proposed fuels treatments in the project area, BLM would consult with the Northern Cheyenne and other tribes to develop treatment plans that would take into account concerns identified through the consultation process.

Cultural Impacts:
No Action: No impacts would occur from treatments, since no mechanical, manual, or prescribed fire treatment would be applied. However, without treatment, sites and artifacts would be at continued high risk from wildfire (e.g., heating impacts) and potential wildfire suppression (e.g., heavy equipment use). The vulnerability of archeological resources to fire management activities is dependent upon the types of materials within the sites and whether they are buried or exposed to the elements.

Fire effects to cultural resources vary depending on temperature and duration of exposure to heat. Generally, fire does not affect buried cultural materials. Hotter temperatures and longer exposure to fire may affect lithic materials. Generally, structural damage to lithics does not occur until the temperatures exceed the original firing temperature. Fire can affect the appearance of pottery shards. Organic materials such as basketry would usually alter or burn at lower temperatures than inorganic items. Fire suppression activities including hand lines and bulldozer lines, application of fire retardants, and establishment of fire camps have considerable potential damage to archaeological and historic sites. Other fire effects to cultural resources include increased visibility from vegetation burn-off; physical damage to sites from snags/trees falling; soil erosion and loss of archaeological data; increased damage from new drainage patterns and flood; and increased rodent and insect activity within the site soil matrix Winthrop, K. 2004).

Proposed Action: Sites and artifacts could be destroyed or irreparably damaged by mechanical and prescribed fire treatment methods. Treatment measures and recommendations for avoidance and inventory are discussed in the cultural report referenced above. A positive cumulative impact could be the increase in the knowledge database for the area resulting from increased surveys associated with the implementation of this project. Since only 20% of the area has been surveyed to date, and those surveys have indicated a variable site density of up to 21 sites per Section, additional inventory could contribute additional data regarding the prehistoric and historic occupation of the region. The nature of such data can not be determined on the basis of the existing inventory; since recorded information is

relatively minimal and there have been few formal eligibility determinations (see Melton, 2007). Such data, however, typically could include information pertinent to our understanding of settlement patterning, land-use, subsistence, and other lifeways for both the historic and prehistoric occupation of the region. This suggestion is based upon the nature of the known sites; these sites are primarily lithic scatters ranging from Paleoindian through more recent times, plus occasional historic camps (and other resources), unspecified cairns, and a single prehistoric burial.

Negative cumulative impacts include: the possible exposure of sites as roads are built, general soil disturbance, fire damage (for standing structures), and data loss at previously recorded sites. Since the overall level of information for known sites is relatively limited; however, the potential impact to NRHP-eligible resources is difficult to estimate. However, previous consultation between BLM and SHPO suggested that while many of the known sites may not be eligible individually, they merited further evaluation within a broader context. No information is available to indicate if BLM concurred with this SHPO recommendation. If such sites are impacted prior to reevaluation, however, the ability to consider them more broadly (i.e., as collective resources or as resources within a landscape) could be lost.

The Bureau of Land Management would consult with the Northern Cheyenne and other tribes regarding Native American religious concerns prior to implementing the proposed action and have an opportunity to provide comments at that time.

3.19 Lands/Realty/Rights–of-Way (ROW):

Existing Condition

The proposed project involves 18,141.94 acres of Federal BLM administered surface and minerals (14,129.48 acres in Rosebud County and 4,012.46 acres in Custer County). See Appendix A for detailed information.

Rights-of-way on the potentially affected tracts of BLM administered surface include oil and gas pipelines, power-lines, highways, county roads, private roads, buried telephone lines, communications sites, and a railroad. The rights-of-way are listed in Appendix E. Access to BLM administered land is minimal. Access would need to be negotiated with respective landowners for each project which arises from this EA.

The communications sites, power lines, oil and gas lines, and buried telephone lines in the project area all constitute significant investment of time and money as well as being an important part of the infrastructure.

Lands/Realty/ROW Impacts:

No Action: Infrastructure would continue to remain at risk from large fire events.

Proposed Action: Damage could occur to the communications sites, power lines, oil and gas lines, and buried telephone lines during treatment. Undetected spills or leaks of oil and gas could pose a risk during prescribed fire and wildfire activities. The fuels treatment proposed would improve the protection to these sites and fixtures and lessen the risk to them from wildfire. Also the risk of trees falling on the powerlines would be lessened.

3.20 Recreation:

Existing Condition
There are no developed recreation sites within the project area. Recreation is generally seasonal, dispersed and often in the form of hunting during the fall and the spring hunting seasons.

No Action: There would not be any short-term impacts to recreation from the No-Action Alternative. Over the long-term wildfires could adversely affect the habitat for wildlife and reduce the opportunities and the quality of hunting in the project area. Large fires can reduce forage for wildlife. Direct fire-caused mortality has been reported for large as well as small mammals, including coyote, deer, elk, black bear and moose (United States Department of Agriculture Rocky Mountain Research Station 2000).

Proposed Action: Temporary displacement of hunting activities could occur during treatments resulting from area closures. This project area includes 5% of the federal land in Montana available for hunting during fall and spring. Prescribed burning could enhance habitat for elk and deer. Burning shrub and grassland communities often leads to increases in plant production and nutritional quality that benefit herbivores, resulting in increased herbivore use of burned areas. Increased use has been ascribed more specifically to changes in plant community structure, community composition and diversity, nutritional quality, and seasonal availability. In a study from 1988 to 1999, researchers examined responses of elk (*Cervus elaphus*) following prescribed burning of areas burned in 1984 and 1988 that had been formerly dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) in south-central Montana with concurrent monitoring of changes in plant production, nutritional quality, and community composition. Elk made increased use of burned sites up to 15 years after burning. Burning transformed big sagebrush-dominated communities into native herbaceous communities that persisted for 15 years without sagebrush reestablishment (Van Dyke and Darragh 2006).

3.21 Visual Resource Management:

Existing Condition
There is no guidance for Visual Resource Management (VRM) in the current RMP. The characteristic landscape is rolling hills, timbered with ponderosa pine.

Visual Resource Impacts:
No Action: There would be no impacts to VRM from No Action Alternative other than if a large wildfire were to occur as a result of the high fuel loading. A large fire in the area would further change the visual existing character of the area, as it's been changed due to past large fires that have occurred since the completion of the RMP.

Proposed Action: Treatment, and creation of some temporary roads, would alter the characteristics of the landscape by removing trees and adding additional linear features to the landscape until reclaimed, although this potential would be reduced by locating them on contour as much as possible. The roads would be closed at the end of treatments and rehabilitated. Over time the vegetation would develop into a landscape consistent with the existing visual resources.

Chapter 4.0 Persons and Agencies Consulted

The beginning of the project planning process and the date/location of an informational public meeting was announced in the newspapers 12/21/06, 12/28/07 and 1/4/07. Letters were also sent to potentially affected/interested members of the public. Informational public meetings were held in Rosebud on 1/16/03 and in Forsyth, Montana on 1/9/07. All comments indicated support for the project, and no concerns were identified at the meetings or by as a result of the mailings. The Northern Cheyenne Tribe provided comments to BLM.

BLM resource specialists coordinated with the following members of the public and state/federal agency specialists:

Chris Pileski, State Forester, Eastern Montana Land Office
Amy Adler, Rosebud County Weed District
Dan Walsh, Montana Department of Environmental Quality
Dennis Sandbak, Custer National Forest

Chapter 5.0 List of Preparers

BLM Miles City Field Office Staff

Mike Ford, Fuels Program Manager
Bobby Baker, Wildlife Biologist
Doug Melton, Lead Archaeologist
Andy Bobst, Hydrologist
Robert Mitchell, Soils Scientist
Dawn Doran, Rangeland Management Specialist
Dan Benoit, Natural Resource Specialist
Pam Wall, Realty Specialist
Brenda Witkowski, Natural Resource Specialist (Weeds)
Eric Lepisto, Assistant Fire Management Officer
Scott McAvoy, Assistant Fire Management Officer

Ecosystem Management, Inc. Staff

Julie Korb, Forestry. Ph.D Fire Ecology
Mike Tremble, Project Lead. M.Sc. in Biology
Nina Harris, Archaeologist, M.A. in Anthropology
Chad Cyrus, Wildlife Biologist. B.Sc. in Biology, Education and industrial technology
Stephanie Lee, Biologist. M.Sc. in Biology

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I. Appendices

APPENDIX A
11/10/04

Location of BLM Land

TOWNSHIP	RANGE	SECTION	SUBDIVISION	ACRES
1 North	44 East	2	Lots 1,2, S½NE¼	161.69
2 North	43 East	2	SE¼SE¼	40.00
2 North	43 East	12	NW¼NE¼, N½NW¼	120.00
2 North	44 East	22	NW¼NE¼, NE¼NW¼,	80.00
2 North	44 East	26	W½NE¼, NW¼	240.00
2 North	44 East	34	E½	320.00
2 North	45 East	2	All	640.00
2 North	45 East	8	S½	320.00
3 North	42 East	12	NE¼NE¼, SE¼NE¼	80.00
3 North	43 East	22	Lots 1-4, E½, E½W½	643.28
3 North	43 East	24	All	640.00
3 North	43 East	26	S¼	160.00
3 North	44 East	2	E½E½, W½W½	320.00
3 North	44 East	6	Lots 1, 3, 4, SE¼NE¼, NE¼NW¼, E½SE¼	272.40
3 North	44 East	8	NW¼NW¼, NE¼NW¼	80.00
3 North	44 East	12	All	640.00
3 North	44 East	24	N½N½	160.00
3 North	44 East	30	Lots 1-3, NE¼ , E½NW¼, N½SW¼, N½SE¼	485.17
3 North	45 East	4	Lot 2, SW¼NE¼, SE¼NW¼	119.13
3 North	45 East	6	Lots 1-7, S½NE¼, SE¼NW¼, E½SW¼, SE¼	639.48
3 North	45 East	8	All	640.00
3 North	45 East	10	SW¼NW¼, W½SW¼, SE¼SW¼	160.00
3 North	45 East	14	S½	320.00
3 North	45 East	18	Lots 1, 2, NE¼, E½NW¼	321.19

3 North	45 East	22	All	640.00
3 North	45 East	26	All	640.00
3 North	45 East	34	All	640.00
4 North	43 East	4	Lots 3, 4, S½NW¼, S½	482.03
4 North	43 East	8	All	640.00
4 North	43 East	10	All	640.00
4 North	43 East	12	NW¼NE¼, N½NW¼, SW¼NW¼	160.00
4 North	43 East	14	N½NE¼, SW¼NE¼, W½, NW¼SE¼	480.00
4 North	43 East	26	N½N½	160.00
4 North	43 East	28	Lots 1,2 NE¼, E½NW¼	326.54
4 North	43 East	32	SE¼NE¼	40.00
4 North	44 East	4	Lot 2, SW¼NE¼	70.04
4 North	45 East	32	All	640.00
5 North	42 East	4	Lots 1, 2, S½NE¼, SE¼	313.12
5 North	42 East	10	W½NE¼, W½, SE¼	560.00
5 North	42 East	22	Lots 1-11, NW¼, NW¼SE¼	643.51
5 North	42 East	24	Lots 1-11, NE¼, NE¼SW¼	627.05
5 North	43 East	8	All	640.00
5 North	43 East	12	NE¼, NE¼NW¼, N½SE¼, SE¼SE¼	320.00
5 North	44 East	2	Lots 1-4, S½N½, S½	640.48
5 North	44 East	4	Lots 1, 2, S½NE¼, SW¼NW¼, NW¼SW¼, N½SE¼	322.62
5 North	44 East	6	Lots 3, 4, S½NW¼, SW¼	330.26
5 North	44 East	8	All	640.00
5 North	44 East	10	E½NE¼, NW¼, S½SE¼	320.00
5 North	44 East	12	Lots 1, 2, W½W½	256.09
5 North	44 East	18	N½	320.00
5 North	44 East	20	All	640.00
5 North	44 East	32	N½NE¼, NW¼, S½SE¼	320.00

6 North	44 East	12	Lot 1, SE¼NE¼, E½SE¼	155.50
6 North	44 East	22	S½NW¼, W½SW¼	160.00
6 North	44 East	26	S½	320.00
6 North	44 East	32	All	640.00
6 North	44 East	34	All	640.00
6 North	45 East	10	NE¼NW¼	40.00
6 North	45 East	18	E½SE¼	80.00
6 North	45 East	26	E½	320.00
6 North	45 East	30	Lots 1, 3, 4, E½SW¼, SE¼	412.66

APPENDIX B

Average Forestry Conditions by Treatment Area

North Miller Creek

Aspect	Tpa by species	Basal Area by species	Avg. Ht. by species	Tiers	Most common size class(dbh)	Large trees dbh	Small trees dbh
North	150 J 350 PP	5 J 80 PP	16 J 27 PP	2-3	3 J 3-7 PP Ht. 11J 18 PP Age 65 J 50 PP	8 J 21-24 PP Ht. 16 J 65 PP Age 90 J 130 PP	1 J 2 PP Ht. 7 J 8 PP Age 24 PP
East	150 J 150 PP		10 J 22 PP	2	2 J 2 PP Ht. 7 J 8 PP Age 60 J 25 PP	8 J 18 PP Ht. 18 J 39 PP Age 85 J 125 PP	1 J 1 PP Ht. 3 J 3 PP Age 45 J 20 PP
West	190 J 110 PP		9 J 19 PP	2	2 J 7-8 PP Ht. 8 J 26 PP Age 60 J 70 PP	5 J 18 PP Ht.12 J 31 PP Age 70 J 125 PP	1 J 1 PP Ht. 3J 6 PP Age 50J 25 PP
South	100 J 240PP		12 J 18 PP	2	2 J 5 PP Ht.9 J 15 PP Age 60 J 50 PP	8 J 18 PP Ht. 20 J 33 PP Age 90 J 125 PP	1 J 1 PP Ht. 2J 3 PP Age

Cherry Creek

Aspect	Tpa by species	Basal Area by species	Avg. Ht. by species Ft.	Tiers in stand	Most common size class(dbh) in.	Large trees (dbh) In.	Small trees (dbh) In.
North	315 J 260 PP	7 J 57 PP	9 J 20 PP	3	2 J 4 PP Ht. 9 J 20 PP Age 50J 50 PP	8 J 19 PP Ht. 24 J 45 PP Age 80 J 130 PP	1 J 1 PP Ht. 3 J 4 PP Age 20 PP
East	422 J 426 PP	3 J 50 PP	10 J 22 PP	3	2 J 6 PP Ht. 6 J 19 PP Age 55 J 55 PP	10 J 19 PP Ht. 25 J 56 PP Age 90 J 130 PP	2 J 2 PP Ht. 6 J 10 PP Age 50 J 30 PP
West	260 J	4 J	10 J	2	1 J	6 J	1 J

	350 PP	20 PP	18 PP		3 PP Ht. 7 J 10 PP Age J 40 PP	16 PP Ht.13 J 26 PP Age 70 J 105 PP	1 PP Ht. 7 J 5 PP Age J PP
South	100 J 200PP	4 J 19 PP	8 J 18 PP	3	2 J 3 PP Ht.6 J 16 PP Age 50 J 40 PP	14 J 19 PP Ht.18 J 38 PP Age 200+ J 140 PP	1 J 1 PP Ht. 2 J 2 PP Age J PP

Howard Coulee

Aspect	**Tpa by species**	**Basal Area by species**	**Avg. Ht. by species Ft.**	**Tiers in stand**	**Most common size class(dbh) in.**	**Large trees (dbh) In.**	**Small trees (dbh) In.**
North	300 J 800 PP	8 J 38 PP	11 J 20 PP	3	2 J 3 PP Ht. 8 J 16 PP Age 50 J 40 PP	8 J 17 PP Ht.21 J 41 PP Age 90 J 120 PP	1 J 1 PP Ht. 4 J 3 PP Age PP
East	360 J 410 PP	11 J 22 PP	12 J 25 PP	3	2 J 2 PP Ht. 4 J 6 PP Age 50 J 30 PP	9 J 18 PP Ht. 20 J 44 PP Age 90 J 125 PP	2 J 2 PP Ht. 5 J 6 PP Age 45 J 25 PP
West	J 300 PP 200	J 10 PP 55	J 11 PP 20	2	J 2 PP 5 Ht. J 7 PP 19 Age J 30 PP 45	J 9 PP 20 Ht. J 17 PP 40 Age J 90 PP 140	J 1 PP 1 Ht. J 2 PP 3 Age J PP
South	J 130 PP 180	J 3 PP 15	J 9 PP 17	2	J 2 PP 3 Ht. J 6 PP 15 Age J 50 PP 40	J 7 PP 18 Ht. J 16 PP 37 Age J 70 PP 125	J 1 PP 1 Ht. J 1 PP 2 Age J PP

Rosebud Buttes

Aspect	**Tpa by species**	**Basal Area by species**	**Avg. Ht. by species Ft.**	**Tiers in stand**	**Most common size class(dbh) in.**	**Large trees (dbh) In.**	**Small trees (dbh) In.**
North	J 712 PP 12	J 29 PP 0	J 12 PP 2	1	J 3 PP 1 Ht. J 9 PP 2 Age J 60 PP	J 12 PP Ht. J 15 PP Age J 120 PP	J 1 PP 1 Ht. J 3 PP 2 Age PP
East Very scattered trees	J PP	J PP	J PP		J PP Ht. J PP Age J PP	J PP Ht. J PP Age J PP	J PP Ht. J PP Age J PP
West	J 116 PP 24	J 5 PP 12	J 9 PP 13		J 3 PP 8 Ht. J 8 PP 36 Age J 50 PP 70	J 6 PP 19 Ht. J 12 PP 36 Age J 70 PP 130	J 1 PP 1 Ht. J 3 PP 2 Age J PP
South Very scattered trees	J PP	J PP	J PP		J PP Ht. J PP Age J PP	J PP Ht. J PP Age J PP	J PP Ht. J PP Age J PP

Snyder Creek

Aspect	Tpa by species	Basal Area by species	Avg. Ht. by species Ft.	Tiers in stand	Most common size class(dbh) in.	Large trees (dbh) In.	Small trees (dbh) In.
North	J 328 PP 328	J 2 PP 60	J 9 PP 23	2	J 2 PP 8 Ht. J 6 PP 31 Age J 50 PP 70	J 9 PP 18 Ht. J 14 PP 35 Age J 100 PP 140	J 1 PP 1 Ht. J 2 PP 1 Age PP
East	J 200 PP 228	J 1 PP 15	J 7 PP 17	2	J 2 PP 3 Ht. J 6 PP 10 Age J 40 PP 50	J 6 PP 17 Ht. J 13 PP 31 Age J 70 PP 120	J 1 PP 1 Ht. J 2 PP 1 Age J PP

West	J 150 PP 150	J 4 PP 18	J 9 PP 17	2	J 2 PP 3 Ht. J 5 PP 8 Age J 40 PP 40	J 7 PP 17 Ht. J 15 PP 27 Age J 80 PP 110	J 1 PP 1 Ht. J 2 PP 2 Age J PP
South No info	J PP	J PP	J PP		J PP Ht. J PP Age J PP	J PP Ht. J PP Age J PP	J PP Ht. J PP Age J PP

Iron Jaw

Aspect	Tpa by species	Basal Area by species	Avg. Ht. by species Ft.	Tiers in stand	Most common size class(dbh) in.	Large trees (dbh) In.	Small trees (dbh) In.
North	J 352 PP 490	J 3 PP 45	J 8 PP 25	3	J 2 PP 3 Ht. J 7 PP 20 Age J 40 PP 40	J 6 PP 17 Ht. J 11 PP 43 Age J 70 PP 110	J 1 PP 1 Ht. J 2 PP 2 Age PP
East No info	J PP	J PP	J PP		J PP Ht. J PP Age J PP	J PP Ht. J PP Age J PP	J PP Ht. J PP Age J PP
West	J 210 PP 333	J 2 PP 14	J 7 PP 20		J 2 PP 2 Ht. J 6 PP 8 Age J 50 PP 30	J 6 PP17 Ht. J 13 PP 47 Age J 70 PP 100	J 1 PP 1 Ht. J 3 PP 3 Age J PP
South	J PP	J PP	J PP		J PP Ht. J PP Age J PP	J PP Ht. J PP Age J PP	J PP Ht. J PP Age J PP

APPENDIX C

List of Allotments, and Total AUMs

Allotment Number	Allotment Name	AUMs
10157	Anderson	31
10050	Searcy-Ball Unit	182
00042	Coston	47
10321	Section 3	72
10032	Iron Jaw	110
00641	North Luther	69
00778	Cow Creek	350
10104	Cow Creek	113
00586	Miller Creek	398
10016	Twelve Mile Creek	347
10015	Rosebud Creek	73
10019	Cornwell	72
10078	Philbrick	78
10333	Harwood	67
00890	Harwood	16
20742	South Luther	54
10049	Brinski Unit	93
10045	Harstad Home Place	39
10024	Rosebud Buttes	172
10056	Larsen	59
01229	Lockie	52
00043	Hamilton	24
10033	Sweeney Creek	30
10093	Smith Place	185
10008	Graveyard Creek	179
10080	Polich, Arthur	95
00851	Cherry Creek	112
10007	Batey	147
10212	Miller Creek	216
10755	W. Rosebud	33

APPENDIX D

Legal Description of Treatment Areas

1.)North Miller Creek
Located in the South East portion of the area; This area includes the following BLM administered lands:
T. 3 N., R. 44 E., Section 2, E½E½, W½W½; Section 12, All; Section 24, N½N½;
T. 3 N., R. 45 E., Section 4, Lot 2, SW¼NE¼, SE¼NW¼; Section 6, All (lotted); Section 8, All; Section 10, SW¼NW¼, W½SW¼, SE¼SW¼; Section 14, S½; Section 18, Lots 1 and 2, NE¼, N½NW¼; Section 22, All, Section 26, All;
T. 4 N., R. 45 E., Section 32, All, Section 34, All.

2.) Iron Jaw Located in the North East portion of the area, just south of Hathaway, MT. This area includes the following BLM administered lands:
T. 5 N., R. 43 E., Section 12, NE¼, NE¼NW¼, N½SE¼, SE¼SE¼;
T. 5 N., R. 44 E., Section 2, All (lotted); Section 4, Lots 1 and 2, S½NE¼, SW¼NW¼, NW¼SW¼, N½SE¼; Section 6, Lots 3 and 4, S½NW¼, SW¼; Section 8, All; Section 10, E½NE¼, NW¼, S½SE¼; Section 12, Lots 1 and 2, W½W½; Section 20, All; Section 32, N½NE¼, NW¼, S½SE¼; T. 6 N., R. 44 E., Section 12, Lot 1, SE¼NE¼, E½SE¼; Section 22, S½NW¼, W½SW¼; Section 26, S½; Section 32, All; Section 34, All;
T. 6 N., R. 45 E., Section 10, NE¼NW¼; Section 18, E½SE¼; Section 26, E½, Section 30, Lots 1, 3, and 4, E½SW¼, SE¼.

3.) Cherry Ck. Located in the SW corner of the area off the Rosebud Cr. Road. This area includes the following BLM administered lands:
T. 3 N., R. 43 E., Section 22, All (lotted); Section 24, All;
T. 3 N., R. 44 E., Section 6, Lots 1, 3, and 4, SE¼NE¼, W½SW¼, E½SE¼; Section 30, Lots 1, 2, and 3, NE¼, E½NW¼, N½SW¼, N½SE¼.

4.) Rosebud Buttes Located in the NW corner of the area. This area includes the following BLM administered lands:
T. 5 N., R. 42 E., Section 4, Lots 1 and 2, S½NE¼, SE¼; Section 10, W½NE¼, W½, SE¼; Section 22, All (lotted); Section 24, All (lotted);
T. 5 N., R. 43 E., Section 8, All.

5.) Howard Coulee Located in the W central portion of the area. This area includes the following BLM administered lands:
T. 4 N., R. 43 E., Section 4, Lots 3,4, S½NW¼, S½, Section 8, All; Section 10, All; Section 12, All, Section 14, N½NE¼, SW¼NE¼, W½, NW¼SE¼, Section 26, N½N½.

6.) Snyder Ck. Located in the southern most portion of the project area. This area includes the following BLM administered lands:
T. 1 N., R. 44 E., Section 2, Lots 1, 2, S½NE¼;
T. 2 N., R. 43 E., Section 2, SE¼SE¼; Section 12, NW¼NE¼, N½NW¼;
T. 2 N., R. 44 E., Section 22, NW¼NE¼, NE¼NW¼, Section 26, W½NE¼, NW¼; Section 34, E½.

APPENDIX E

Rights-of-Way
Within
Wildhorse Fuels Reduction Project Area

The following is a list of the rights-of-way on the affected tracts of BLM administered surface within the Wildhorse Fuels Reduction Project Area:

MTM-0766 – Williston Basin Pipeline Gas Pipeline Right-of-Way – T. 6 N., R. 44 E., Sec. 12, SE¼NE¼.
MTM-013205 - Cenex Pipeline LLC Oil Pipeline Right-of-Way – T. 6 N., R 45 E., Sec. 10, NE¼NW¼.
MTM-025503 – Montana-Dakota Utilities Powerline Right-of-Way - T. 6 N., R. 44 E., Sec. 12, SE¼SE¼.
MTBIL-040948 – Montana-Dakota Utilities Powerline Right-of-Way - T. 6 N., R. 44 E., Sec. 12, SE¼NE¼.
MTM-043847 – Montana Highway Commission I-94 Highway Right-of-Way - T. 6 N., R. 44 E., Sec. 12, SE¼NE¼, NE¼SE¼.
MTM-38967 - MCFBI Rosebud Buttes Communication Site Right-of-Way - T. 5 N., R. 42 E., Sec. 24, NE ¼.
MTM-44172 – Mid-Yellowstone Electric Powerline Right-of-Way - T. 5 N., R. 42 E., Sec. 24, Lots 1-4, S½NE¼.
MTM-57653 – Tongue River Electric Coop. Overhead Powerline Right-of-Way - T. 3 N., R. 44 E., Sec. 24, N½NW¼.
MTM-59032 – Range Telephone Coop. Buried Telephone Cable - T. 5 N., R. 42 E., Sec. 24, E½NE¼; T. 6 N., R. 44 E., Sec. 12, Lot 1.
MTM-71918 – Rosebud County Road Right-of-Way – T. 5 N., R. 42 E., Sec. 24, Lots 1, 2, 4, NE¼.
MTM-79096 – Qwest Corporation Buried Telephone Cable Right-of-Way - T. 6 N., R 45 E., Sec. 10, NE¼NW¼.
MTM-79112 – Range Telephone Coop. Buried Telephone Cable Right-of-Way – T. 6 N., R. 44 E., Sec. 12, SE¼NE¼.
MTM-87793 – John and Michelle Jutila Road Right-of-Way - T. 5 N., R. 42 E., Sec. 24, Lot 8.
MTM-89594 – KSVI Television Communication Site Right-of-Way - T. 5 N., R. 42 E., Sec. 24, SE¼SE¼NE¼.
MTM-93626 – Verizon Wireless Communication Site Right-of-Way – T. 5 N., R. 42 E., Section 24, SE¼NE¼
(The BNSF Railroad also runs through Lot 1, Section 12, T. 6 N., R. 44 E., but does not show on the MT Plat)

The following lists the above rights-of-way by legal descriptions:

<u>T. 3 N., R. 44 E., Sec. 24, N½NW¼, P.M.M.</u>
MTM-57653 – Tongue River Electric Coop. Overhead Powerline Right-of-Way
<u>T. 5 N., R. 42 E., Sec. 24, Lots 1-4, 8, NE ¼, P.M.M.</u>
MTM-38967 - MCFBI Rosebud Buttes Communication Site Right-of-Way
MTM-44172 – Mid-Yellowstone Electric Powerline Right-of-Way
MTM-59032 – Range Telephone Coop. Buried Telephone Cable
MTM-71918 – Rosebud County Road Right-of-Way
MTM-87793 – John and Michelle Jutila Road Right-of-Way
MTM-89594 – KSVI Television Communication Site Right-of-Way
MTM-93626 – Verizon Wireless Communication Site Right-of-Way
<u>T. 6 N., R. 44 E., Sec. 12, Lot 1, SE¼NE¼, E½SW¼, P.M.M.</u>
MTM-0766 - Williston Basin Pipeline Gas Pipeline Right-of-Way
MTM-025503 – Montana-Dakota Utilities Powerline Right-of-Way
MTBIL-040948 – Montana-Dakota Utilities Powerline Right-of-Way
MTM-043847 – Montana Highway Commission I-94 Highway Right-of-Way
MTM-59032 – Range Telephone Coop. Buried Telephone Cable
MTM-79112 – Range Telephone Coop. Buried Telephone Cable Right-of-Way
BNSF Railroad Right-of-Way
<u>T. 6 N., R 45 E., Sec. 10, NE¼NW¼, P.M.M.</u>
MTM-013205 - Cenex Pipeline LLC Oil Pipeline Right-of-Way
MTM-79096 – Qwest Corporation Buried Telephone Cable Right-of-Way