CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

Introduction

Chapter 4 describes the environmental, economic and social consequences of implementing the alternatives presented in Chapter 2. The impacts were identified and evaluated by an interdisciplinary team of resource specialists and are presented here by resource and alternative. (Refer to Chapter 3 for a detailed description of each resource.) Impacts are quantified, where possible, in magnitude, duration and intensity.

Chapter 4 is presented in five sections:

- Analysis Assumptions and Guidelines
- Impacts from the Alternatives (including impacts common to all alternatives)
- Unavoidable Adverse Impacts
- Short-Term Use versus Long-Term Productivity
- Irreversible and Irretrievable Commitment of Resources.

The environmental impacts of the alternatives are summarized in Table 2.39 at the end of Chapter 2.

Analysis Assumptions and Guidelines

The assumptions and guidelines used for analyzing the impacts of each alternative are discussed below by resource. Resources with no specific analysis assumptions and guidelines are not discussed.

These assumptions provide the basis for the cumulative impacts analysis, which is addressed in the environmental consequences for each resource and summarized at the end of each section. The cumulative impacts assessment prepared for each resource accounts for past, present, and reasonably foreseeable future actions that are relevant to determining the significant adverse impacts of the alternatives. These actions include, but are not necessarily limited to the reasonably foreseeable natural gas wells including roads and pipelines, the foreseeable visitor use on the Missouri River, the future increase in visitor use for the uplands, fire occurrence, and the many past actions that occurred in the Monument, the majority of which are identified in the affected environment (Chapter 3). These actions include limited farming of crops, water developments/range improvements, natural gas wells, pipelines, rights-of-ways, developed recreation sites, roads, and backcountry airstrips. Through reclamation efforts a lot of these actions no longer have an impact on the environment while others have reclaimed naturally over time leaving little residual effect. Other actions are still evident, such as roads, and the impacts are addressed in the environmental consequences sections for each resource, in particular the impacts from Alternative A (Current Management), which identifies the present effects of past actions to the extent they are relevant and useful for a comparison of the alternatives.

Cultural Resources

The analysis of effects to cultural resources includes several assumptions. Regardless of which alternative is selected, the BLM will comply with all applicable laws. Mitigating measures for resource protection would be applied to all authorized actions. Each alternative is directed at protecting the objects for which the Monument was designated. The approach to protection, not the overall intent, is the difference between alternatives.

Fish and Wildlife

Greater Sage-Grouse

Canfield et al. (1999) pointed out that forced activity caused by human disturbance exacts an energetic disadvantage, while inactivity provides an energetic advantage for animals. Geist (1978) further defined the effects of human disturbance in terms of increased metabolism, which could result in illness, decreased reproduction, and even death.

Disturbance near leks may disrupt breeding and cause birds to abandon traditional breeding sites, or reduce breeding success for that year. Disturbance within nesting areas may cause destruction or abandonment of nests; resulting in no hatch. These actions could contribute to the overall statewide decline in sage-grouse populations.

Sage-grouse are susceptible to disturbance during winter roosting in severe weather and temperatures. Sage-grouse operate at an energy deficit in cold winter weather when forage species are dormant and nutrient levels are poor. This requires behavior that emphasizes energy conservation. Protection of greater sage-grouse and crucial breeding, nesting, and winter habitat could promote sage-grouse survival.

Black-Tailed Prairie Dogs

Prairie dogs and many associated species are impacted by above-ground structures used by raptors for roosting and feeding. Allowing above-ground structures may cause some ground nesting and roosting birds to avoid these areas, reducing the available habitat for these specialized species.

Designated Sensitive Species

Raptors are susceptible to disturbance while nesting, and may abandon nests with eggs or chicks if the level of disturbance is unacceptable. Acceptable disturbance varies by species, but could cause the failure of nests, reducing the productivity of species already in decline.

Bald Eagle

Canfield et al. (1999) pointed out that forced activity caused by human disturbance exacts an energetic disadvantage, while inactivity provides an energetic advantage for animals. Geist (1978) further defined effects of human disturbance in terms of increased metabolism, which could result in illness, decreased reproduction, and even death.

Bald eagles are susceptible to disturbance while nesting, and may abandon nests with eggs or chicks if the level of disturbance is unacceptable. Disturbance could cause the failure of nests, reducing the productivity of a threatened species which is protected by the Endangered Species Act.

Bald eagles are susceptible to disturbance during winter roosting in severe weather and temperatures. Bald eagles operate at an energy deficit in cold winter weather when their prey species are fewer and harder to catch. This requires behavior that emphasizes energy conservation.

Big Game Winter Range

Canfield et al. (1999) pointed out that forced activity caused by human disturbance exacts an energetic disadvantage, while inactivity provides an energetic advantage for animals. Geist (1978) further defined effects of human disturbance in terms of increased metabolism, which could result in illness, decreased reproduction, and even death.

Big game ungulates operate at an energy deficit in cold winter weather when their forage species are dormant and nutrient levels are poor. This requires behavior that emphasizes energy conservation.

Bighorn Sheep Distribution and Lambing Areas

Canfield et al. (1999) pointed out that forced activity caused by human disturbance exacts an energetic disadvantage, while inactivity provides an energetic advantage for animals. Geist (1978) further defined effects of human disturbance in terms of increased metabolism, which could result in illness, decreased reproduction, and even death.

Bighorn sheep operate at an energy deficit in cold winter weather when their forage species are dormant and nutrient levels are poor. This requires behavior that emphasizes energy conservation.

Water

Except for the management of fire, all of the alternatives discussed in this plan will have only a slight, if any, impact on water resources. Each alternative complies with applicable laws and regulations such as the Clean Water Act, the Safe Drinking Water Act, the State of Montana Department of Environmental Quality regulations, and the Montana Department of Natural Resources water rights regulations. Mitigating measures for resource protection would be applied to all authorized actions. Each alternative would be directed at protecting the objects for which the Monument was designated. The management prescriptions contained in the watershed plans, which cover all allotments in the Monument, will create the greatest impact to water resources. These watershed plans are described in the Decisions Common to All Alternatives section of Chapter 2.

Minerals – Oil and Gas

The Reasonably Foreseeable Development (RFD) scenario for natural gas exploration and development is contained in Appendix K.3. This RFD is the basis for assessing cumulative impacts from further natural gas exploration and development. The RFD discusses the general exploration and development process and projects the level of anticipated activity (including the number of wells drilled and associated roads). The RFD is based on the exploration and development areas in the Monument study area, which includes the potential for 73 new natural gas wells. However, this is prior to considering any resource stipulations or conditions of approval. Even under the least restrictive alternative, Alternative B, one of the wells would most likely not be drilled.

Table 4.1 provides a summary by alternative of the number of foreseeable wells drilled, miles of new road constructed, and miles of new pipeline constructed after considering resource stipulations and conditions of approval. The cumulative impacts to oil and gas are discussed in the Impacts to Minerals – Oil and Gas section of this chapter.

The cumulative impacts may also include the potential for five natural gas wells on state or fee minerals within 1/2 mile of the Monument.

Recreation - River

Visitors to the Upper Missouri National Wild and Scenic River (UMNWSR) currently enjoy many recreation opportunities. From 1975 to 1997, use on the river stayed relatively flat, ranging from 2,000 to 3,000 visitors per year. In 1998, the river experienced a significant increase to 4,339 visitors. Since 1998, use has increased on an average of 339 registered boaters per year. Most of that increase came in 1999, and use has since ranged from approximately 5,400 to 6,034 registered boaters each year. From 2000-2004, use increased an average of 148 boaters per year.

The UMNWSR is a national destination point for boaters. However, the remote nature of the river and travel distances and time required, the multiple days required to float the river, and the lack of a nearby significant population base has kept use numbers relatively low compared to other major rivers in the country.

For the purpose of impact analysis, an increase of 5% per year in visitor use will be assumed. This increase is assumed given current management of the river. In 2004 the total registered use was 5,993. An increase of 5% per year between 2004 and 2015 would result in the annual registered use figures shown in Table 4.2.

Table 4.2
Foreseeable Annual Visitor Use on the Upper Missouri River

Year	*Visitor Use*
2005	6,293
2006	6,608
2007	6,938
2008	7,285
2009	7,649
2010	8,031
2011	8,433
2012	8,855
2013	9,298
2014	9,763
2015	10,251

Recreation - Uplands

Historically, visitor use in the uplands has occurred during the hunting season, or the months of September, October, and November. While there is some activity during the summer months, historically that use has been very low.

Visitor use during the hunting season will likely continue to be a product of available big game and upland game, and the availability of opportunities afforded by Montana Fish,

Table 4.1
Reasonably Foreseeable Natural Gas Wells, Roads, and Pipelines

Activity	*Alternative A Current Mgmt)*	*Alternative B*	*Alternative C*	*Alternative D*	*Alternative E*	*Alternative F (Preferred) Alternative)*
Monument						
Wells (No.)	35	44	28	13	0	34
Roads (miles)	10.1	17.4	7.4	0.4	0	11.1
Pipelines (miles)	3.5	6.1	2.6	0.1	0	3.9
Other (within 1/2 mile of the Monument on federal leases)						
Wells (No.)	21	23	21	20	18	21
Roads (miles)	4.0	4.4	4.1	4.0	4.0	4.0
Pipelines (miles)	1.4	1.5	1.4	1.4	1.4	1.4
Total						
Wells (No.)	56	67	49	33	18	55
Roads (miles)	14.1	21.8	11.5	4.4	4.0	15.1
Pipelines (miles)	4.9	7.6	4.0	1.5	1.4	5.3
Another 5 wells could be drilled on state or fee minerals within 1/2 mile of the Monument						
Wells Not Drilled	12	1	19	35	50	13

Wildlife & Parks to hunt various species. Currently, approximately 300-500 people are in the uplands for the opening of big game season (October). But this number decreases to approximately 100 per week for the remainder of the season.

Summer season use (July through August), which includes hiking and motor vehicle touring, could see an increase in use as a result of the Monument designation and the increased national exposure the area has received. Approximately 100 people per week use this area during the summer. For the purpose of impact analysis a 5% increase in visitor use per year will be assumed.

Fire

Most fires are the result of lightning. Approximately 7% of the acres burned are the result of human-caused fires. The BLM does not anticipate a noticeable increase in human-caused fires.

The fire history for the last 15 years (1988-2003) for the Monument is displayed in Table 4.3.

Table 4.3
Fire Occurrence in the Monument

Area	*Fires 1988-2003*	
	Number	*Acres*
Northern Portion	45	5,023
Southern Portion	44	2,979
Wild and Scenic River	27	1,337
WSAs and ACEC	37	4,219
Total	153	13,558

Range Improvements

Range improvements are actions initiated and implemented through activity plans or watershed plans and are not specifically analyzed in this resource management plan.

Transportation

The transportation system will identify the roads needed to meet the objectives of the Monument and the Proclamation.

A road is a linear route segment that can be created by the passage of vehicles (two-track); constructed; improved; or maintained for motorized travel. All BLM roads are associated with motorized travel.

This transportation system will consist of BLM roads that will be designated as collector roads, local roads, or resource roads and will be designated as either open yearlong, open seasonally, or closed yearlong for motorized use. Each BLM road will be assigned a maintenance level from 1 through 5. Motorized vehicle use off road is not allowed in the Monument, including 4x4s, ATVs, snowmobiles, etc.

The density (number) and miles of BLM roads could be less in the Monument and the spatial landscape (number of acres between BLM roads) could increase.

Social

The average age of the national and local populations will continue to increase.

In many cases, the social impacts are described in terms of effects to social wellbeing, which could include the amount and quality of available resources such as recreation opportunities, and resolution of problems related to resource activities. Other less tangible beliefs that could affect social wellbeing include individuals having a sense of control over the decisions that affect their future, and feeling that the government strives to act in ways that consider all stakeholders' needs.

The groupings in this section are made to facilitate the discussion of social impacts. It should be noted that these groupings generalize the members' actual beliefs and values. For instance, some ranchers engage in recreation and are particularly concerned about resource protection. Recreationists may engage in both motorized and nonmotorized activities. The social analysis will include the groups and individuals most likely to be affected by this plan.

Impacts from the Alternatives

This section describes the impacts by resource and includes impacts common to all alternatives and the impacts from the alternatives presented in Chapter 2. Only those resources that could be impacted by a particular alternative are discussed. Impact analyses and conclusions are based on interdisciplinary team knowledge of the resources, information provided by other BLM offices and agencies, and information from pertinent literature. Since the alternatives, at times, provide general management direction, the analysis may represent best estimates of impacts since specific locations and proposed actions are often unknown. Impacts are quantified to the extent practical with available data. In the absence of quantitative data, best professional judgment provides the basis for the impact analysis.

The UMNWSR designation and classification as recreational, scenic, and wild would not change under any of the alternatives. While the alternatives may affect some resources within the UMNWSR, which are discussed under the pertinent resource section in this chapter, the designation and classification would not be affected.

The designation of the Cow Creek Area of Critical Environmental Concern (ACEC) would not change under any of the alternatives. Management under any of the alternatives would protect the resources for which the area was designated; the Nez Perce National Historic Trail, the Cow Island Trail, and paleontological values.

Air Quality

Impacts to Air Quality Common to All Alternatives

The BLM will comply with national and state air quality standards, and management actions will minimize or prevent air quality degradation and protect the Class II designation in the Monument.

Air pollution is controlled through ambient air quality and emission standards and permit requirements established under the federal Clean Air Act and the Montana Clean Air Act. Montana has adopted federal ambient air standards and also has established stricter state standards for some pollutants.

Best Management Practices (BMPs) will be applied to all surface-disturbing activities to protect air quality. The smoke from wildland fires impacts air quality; however, this is a short-term impact and depends on the location, size and intensity of the fire.

Dust from vehicle traffic on unpaved roads normally occurs during June to November when climate, soils, and vegetation are usually at their driest. Fugitive dust levels would be temporary and normally quickly dispersed by thermal drafts and winds. Motorized vehicle emissions cause a very small short-term impact to localized air quality. The amount and type of emissions varies by the number of motors, type(s) of motor, motor size, and its burning efficiency. Motor emissions, like dust, are normally quickly dispersed.

The terrain surrounding pollution sources greatly influences the effects of emissions. Topographic features such as mountains, valleys or river drainages can combine to severely restrict or greatly enhance the dispersion capacity of a given airshed. These effects are highly localized and often determine how much air quality degradation may occur.

Impacts to Air Quality from Natural Gas Exploration and Development

Air Contaminants from Oil and Gas Activities

The primary air contaminants associated with routine oil and gas drilling, production and storage operations include:

- Airborne dust from construction or traffic on dirt roads
- Diesel fumes from heavy equipment operations
- Combustion byproducts from operation of flaring
- Fugitive emissions from product storage
- Venting or releasing of gases during well testing

All of these potential contaminants, except fugitive emissions, could be prevalent with natural gas operations in the Monument.

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The degree to which individual pollutants become concerns depends on several factors, including:

- Characteristics of the site within each air quality region
- The type of well and the composition of the gas or oil
- Whether the pollutant is generated during site preparation, drilling, testing, production, or abandonment

Air pollution impacts the respiratory, circulatory and odor-sensing systems. Air pollutants usually enter the body through the respiratory system. The effects of various pollutants differ with concentration levels during exposure and the length of the exposure.

Particulate Matter – Particulate matter can be generated by a number of activities during drilling and production. Engines generate small amounts of particulates compared to site and road construction. Once the stable ground cover is removed, dry and exposed soil becomes highly susceptible to wind erosion. Further, vehicle traffic creates turbulence which stirs up dust. The impact of dust depends on the type, quantity and drift potential of the particles loosed into the atmosphere. Large dust particles settle out near the source, often creating a local nuisance. Fine particles are dispersed over a greater distance from the source. The potential drift distance of particles is governed by the height of the source, the size and density of the particle and the degree of atmospheric turbulence.

Tiny particulates can damage paint, reduce visibility and carry poisonous chemicals into the lungs. Short-term exposure to respirable particulates can decrease lung function in children. Long-term exposure can result in increased respiratory distress symptoms and disease, and permanent reduction in lung function in children and adults. Persons with asthma are known to be more susceptible to respiratory problems caused by particulate emissions (U.S. Environmental Protection Agency 1987b).

During a 7-day drilling/completion operation, an estimated 1,000 pounds of pollutants would be emitted per well. During the test phase, an operator would be allowed unrestricted flaring of produced gas for a 30-day period or a volume of 50 million cubic feet (MMCF) of natural gas, whichever comes first following completion. In all likelihood, development wells would not require extended flaring periods for testing (the estimated maximum flaring periods during testing would be 24-48 hours).

Presently, permanent flaring approvals are non-existent for wells within or adjacent to the Monument because all wells are prone to produce gas and they are either placed on line, shut-in, or plugged and abandoned. None of the wells would be expected to produce oil with associated gas. Therefore, after a well is tested, the operator would either complete the well and connect the well to a gas sales line, shut the well in awaiting pipeline infrastructure, or plug and abandon the well.

Nitrogen Oxides – Nitrogen oxides originate in high-temperature combustion processes, such as the operation of diesel engines. These pollutants are a component of photochemical oxidants, causing a stinking brown haze that irritates the nose and throat. Nitrogen oxide molecules occur in several different forms. The most common form found in the ambient air is nitrogen dioxide. Air quality standards are set to limit this form of nitrogen dioxide.

Malodorous/Noxious Gases – Minor amounts of odorous gases, other than hydrogen sulfide, can be present in oil and gas. Odorous sulfur compounds can be grouped into either total reduced sulfur or partially reduced sulfur compounds. A gas analysis must be performed to determine the content of these compounds for any given well.

Known as reduced organic sulfides, these sulfur compounds are typically associated with sour gas and can be present in sour gas, oil and produced water. They produce offensive odors even in minute concentrations. Chemical compounds vary widely in Montana oil and gas. Oil or gas from wells in a given formation in a field may be similar, but wells in the same field producing from different formations may produce different chemical constituents. Thus, without a gas analysis, the potential air quality impacts from venting, flaring, or on-site uses cannot accurately be determined in advance for individual wells. Only on rare occasions in Montana have oil or gas wells received air quality-related review. This usually results when there are complaints or when the operator contacts the Montana Air Quality Bureau regarding pollution control requirements.

Impacts to Air Quality from Oil and Gas Activities

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Air quality regulations define short-term impacts as lasting from a few hours to a few months. Impacts that result from site preparation, road construction, heavy equipment operation, and pre-production activities would usually be short term. Longer-term impacts would be associated with the production phase.

Site Preparation and Construction – Emissions during site preparation and rig set-up would most likely be vehicle exhaust from a number of mobile sources and dust from earth-moving activities during construction of roads, pads and pits. The most common sources would be diesel earth-moving equipment, diesel semi-trucks, and gasoline-powered vehicles and trucks. Particulate matter is the pollutant most likely to significantly impact air quality.

Particulate emissions vary substantially from day-to-day depending on the level of activity, the specific operations, and the prevailing weather. Predicting the impacts involves compilation of a particulate emission inventory from construction and drilling activities. Particulate emissions from site and access road construction would depend upon the total area disturbed. Other important determinants include the amount of silt in the soil and moisture content. Under worst case conditions, emissions of less than 25 tons per year can normally be expected from a single oil or gas well (BLM et al. 1983). Since site and road construction are usually short-term activities, access road use tends to be the major source of fugitive dust over the long term.

Drilling – An air quality permit would be required when emissions for any single pollutant exceed 100 tons per year. Administrative Rules of Montana (ARM) 17.8.744(1)(i.) exempt drilling rig stationary engines and turbines that do not have the potential to emit more than 100 tons per year and that do not operate in the same location for more than 12 months from the need to obtain an air quality permit. The Air Quality Bureau has determined that nitrogen oxides are a potential pollutant of concern for drilling rig engines greater than 1,500 horsepower. The engines typically used on drilling rigs within the Monument are 350 horsepower (about 1/4 the size of an engine considered a potential pollutant of concern). As both engine horsepower and operating periods increase, the likelihood for nitrogen oxides impact also increases.

Several procedures have the potential to impact air quality while the drilling rig is on location or just before the start of production. These include the gas and oil ratio tests, drill stem tests and the stabilized production tests. The most

significant pollutants likely to be emitted during these activities would include hydrogen sulfide gas, sulfur dioxide and volatile organic compounds. These pollutants can be emitted in varying quantities depending on the type of well and its potential flow volume.

Production – The volume of air pollution generated over the life of an oil or gas well would depend on the characteristics of the product and the production practices used. Oil and gas wells that produce hydrogen sulfide in the oil, gas or associated gas are termed sour wells. Sour wells are much more likely to cause air pollution than wells that do not produce hydrogen sulfide, termed sweet wells. Based on historical records, wells within the Monument produce neither oil nor hydrogen sulfide gas, and the gas that is produced from the wells in the Monument is considered sweet gas. Sweet gas is defined as a natural gas that has no more than the maximum sulfur content defined by the specifications for the sales of gas from a plant or the definition by a legal body such as the Railroad Commission of Texas.

Dust Mitigation – Access roads would be the major source of dust over the long term. Dust abatement measures may include watering, applying dust-suppressing chemicals, oiling, asphalt paving and reducing vehicle speed. Watering of roads may reduce fugitive dust by about 50%; chemical suppressant achieves 75-85% reduction; and oiling and asphalt paving could achieve 90-95% control. Other mitigating measures may include closure of roads to any use except drilling, production, or administrative purposes; providing a campsite at the well to reduce road use by workers, and carpooling in highly sensitive areas. Production measures to reduce traffic could include the use of remote wellhead monitoring facilities.

Nitrogen Oxides Mitigation – Nitrogen oxides from internal combustion engines would be the most difficult exhaust pollutant to control. Both vehicles and stationary drilling rig engines emit this pollutant. Good maintenance practices such as regular tune-ups and proper fuel-to-air settings should minimize these emissions. Under worst-case conditions, violations of the 1-hour and annual nitrogen oxide standards could be largely avoided by reducing operational hours or total engine horsepower rating.

Occasionally during well production, some nitrogen oxides would be emitted from the combustion of well gas in flares; however, the emissions would be minimal. As an example, if a gas well were to flare an average of 100 thousand cubic feet (MCF) per day per year, the nitrogen oxide emissions per well would average about 2 tons per year.

Using the reasonable foreseeable development (RFD) information, 5 wells could be drilled per year and assuming all 5 wells are productive, a total of 4,000 MCF or a little more than 1/5 of a ton (438 lbs.) would result. An air quality permit is required when emissions for any single pollutant exceed 25 tons per year (ARM 17.8.744(1)(i.)). One-fifth of a ton per year is well within the limits of 25 tons per year.

Given the age and location of many of the wells, it is possible that compression facilities may be needed to market the gas. Currently, no compressors exist within the Monument; however, a small 42-horsepower compressor has been proposed on private land just outside the Monument. If and when the compressor is set, it is estimated it would emit 5.5 tons per year of nitrogen oxide, assuming it ran 100% of the time.

Prevention and Mitigation – The impacts on air quality due to production operations or well testing would be mitigated by requiring that all produced gas be either captured or flared. If the well is to be connected to a gas line, the air quality impacts would be limited to the period during which gas is tested/flared pending connection. If appropriate, a temporary flaring approval would include requirements as to how the gas would be flared. The recommended stack height would provide for efficient combustion of gas and dispersion of the resultant gases. Based on past drilling, testing, completion and production operations in the Leroy Gas Field, extended gas flaring beyond the 30-day period or a volume of 50MMCF is highly unlikely to occur. The normal flaring period for testing wells rarely goes beyond a 2-day period for typical wells within the Monument.

Summary of Cumulative Impacts to Air Quality

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Natural gas operations would affect air quality from vehicle traffic on unpaved roads, diesel fumes from heavy equipment, combustion byproducts from flaring, and the venting or releasing of gases during well testing. Smoke from wildland and/or prescribed fires could also cause air quality to deteriorate in the local area. Dust generation from other vehicle traffic on unpaved roads would add to the particulates contributed by natural gas operations and smoke. These effects are short-term and normally quickly dispersed by winds.

Cultural Resources

Impacts to Cultural Resources Common to All Alternatives

Both wildland fire and prescribed fire would have the potential to impact cultural resources. Cultural properties can be severely altered or even consumed by fire. Fire may also lead to indirect impacts such as increased erosion or

deposition. Potential impacts of prescribed fires can generally be reduced or eliminated through pre-burn planning and the implementation of specific mitigating measures. Mitigation measures applied during wildland fire suppression are far more limited because they must be general enough to cover large areas lacking specific resource data.

Impacts may occur to cultural properties as a consequence of modern use of the landscape or through deliberate vandalism. Some of the historic buildings in the Monument probably receive dozens of visitors each year. While most people are careful, inadvertent impacts may result just as they would in a private residence with many visitors. Prehistoric sites are subject to the same type of impacts, except most visitors are probably not even aware that their campsite has been used for centuries. More severe impacts result from deliberate vandalism.

Impacts to Cultural Resources from Health of the Land and Fire

Alternative A (Current Management)

Fire is a component of the natural environment which may impact cultural sites, either directly or indirectly. The direct effects of fire include consumption of flammable components or heat/smoke alteration of non-flammable components. Indirect effects include erosion as well as denuding and exposure to vandalism. Both wildland fire and prescribed fire would have the potential to cause these direct and indirect effects. The difference is that prescribed fires would be planned and staged, allowing mitigation of these effects.

Alternative B

This alternative would emphasize aggressive wildland fire suppression at the expense of prescribed fires, where mitigation and avoidance can be incorporated. Aggressive wildland fire suppression with the use of mechanized equipment could impact archaeological or historical sites. This approach would give up the benefits of planned burns and add the effects of aggressive mechanized suppression when compared to Alternatives A and E. In brief, this alternative would use a reactive, rather than proactive approach to fire management.

Alternative C

The impacts would be similar to Alternative B, except aggressive suppression would not be used in wilderness study areas. Additionally, this alternative would allow for prescribed fire with its pre-burn planning benefits, except along the UMNWSR, which would be excluded from prescribed fire.

Alternative D

This alternative would include the benefits of pre-burn planning in all fire management units, with the potential impacts of aggressive fire suppression and mechanized equipment only along the UMNWSR.

Alternative E

The impacts would be the same as Alternative A.

Alternative F (Preferred Alternative

Fire is a component of the natural environment, which may impact cultural sites, either directly or indirectly. The direct effects of fire include consumption of flammable components or heat/smoke alteration of non-flammable components. Indirect effects include erosion as well as denuding and exposure to vandalism. Both wildland fire and prescribed fire would have the potential to cause these direct and indirect effects. The difference is that prescribed fire would be planned and staged, allowing mitigation of these effects.

Impacts to Cultural Resources from Visitor Use, Services and Infrastructure

Alternative A (Current Management)

Historic sites or events would be interpreted as opportunities arise. Currently, minimal signage or interpretation marks the Nez Perce Trail; the Lewis and Clark campsites; the Nelson, Hagadone and Gilmore Homesteads; and Decision Point. It might be expected that marked and interpreted sites would receive more visitation than unmarked sites. Increased visitation may enhance appreciation, but it may also result in more deterioration and additional maintenance.

Alternative B

This alternative would differ from current management by maximizing the number of developed visitor services. There would be a great increase in the number of signs, kiosks, developed trails and visitor services. This would ensure that virtually all visitors to the Monument are exposed to some educational/interpretive materials. However, maximizing the development of signs, kiosks and trails may alter the historic character of some cultural sites through excessive introduction of modern components or changes to the landscape. This alternative may also reduce the opportunities for the personal discovery of history by marking or signing more of the area's historic components than other alternatives.

Alternatives C and D

The development of low-key interpretive sites would expose more visitors to the history of the area than Alternative E, though perhaps not as many as Alternative B. This alternative would leave more opportunities for personal discovery than Alternative B, but less than Alternative E. Developing specific low-key interpretive sites would not likely alter the natural character of the Monument.

Guidebooks and portable exhibits make less of an impact on the landscape than permanent interpretive signs, and guidebooks usually allow more in-depth explanation than signs. However, guidebooks alone may reach fewer visitors than signs.

Alternative E

This alternative provides the maximum potential for personal discovery since there would be no developed interpretive sites or public guidebooks. However, this alternative may result in fewer visitors acquiring access to the area's history.

No permits for archaeological or historical field research would be authorized. Cultural sites would be allowed to disappear without stabilization or further investigation. This alternative would eliminate over 192 known cultural properties from further field research, as well as potential future discoveries. Permits for archaeological or historical research would still be issued for development projects in conformance with Section 106 of the National Historic Preservation Act.

Alternative F (Preferred Alternative)

The development of low-key interpretive sites as well as guidebooks and portable exhibits would expose most visitors to the history of the area. Some opportunities for personal discovery would be sacrificed in order to reach a larger audience. Additionally, some visitors may not care for any type of modern intrusions on the landscape, even interpretive displays. However, it seems likely that most visitors would consider these interpretive additions minute and inoffensive within the extensive landscapes of the Monument.

Impacts to Cultural Resources from Natural Gas Exploration and Development

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Development of existing leases would follow mitigating measures specific to the proposed action. This standard operating procedure would minimize impacts to cultural resources. However, any surface-disturbing activity has the potential to create inadvertent or coincidental impacts to surface resources. Consequently, the alternatives resulting in the greatest surface disturbance are more likely to result in impacts for cultural and historical resources. However, the additional disturbance that may result from the alternatives is so small, that there is no practical difference between them. Additionally, the leases are confined to the uplands, which have a very low site density (as discussed in Chapter 3) and no cultural sites are currently known on the leases, further reducing the likelihood of impacts under any alternative.

No additional leases would be issued in the Monument and the potential for cumulative impacts would be confined to existing leases. Further, much of the natural gas infrastructure (roads and pipelines) already exists and associated impacts have already occurred.

Impacts to Cultural Resources from Access and Transportation

Alternatives A (Current Management) and B

Roads within the Monument improve access to some cultural properties. The road itself is unlikely to directly impact any cultural properties. Even so, open roads used during wet periods may grow in width through avoidance of muddy or deeply rutted stretches. Improved access may increase visitation and appreciation for some cultural properties. Improved access may also lead to increased erosion and vandalism of some cultural properties.

Alternatives C, D, and E

Vehicular access would be restricted in some sensitive areas, thereby reducing potential impacts from erosion and vandalism. However, Alternatives D and E would not include the potential benefits from acquiring new access.

Alternative F (Preferred Alternative)

Restricting vehicular access on some roads and proper design and placement of new access roads could help protect cultural properties.

Summary of Cumulative Impacts to Cultural Resources

Alternative A (Current Management)

Natural processes including erosion, deposition and fire would continue to impact archaeological and historical sites. These same sites may also continue to be subject to human-induced impacts such as vandalism and damage from over visitation.

Alternative B

In the long term, the cumulative effect of this alternative may be an increase in the impacts of fire to cultural properties, by eliminating the benefits of prescribed burns while allowing the impacts of aggressive suppression in addition to the impact of wildland fires themselves. There may also be a gradual change in an area's setting, from an unchanged-for-centuries setting to a you-are-here setting. Long term, this change of setting may alter the historic character of the area, since the unchanged natural setting is key to recalling the area's historic associations.

Alternative C

The impacts would be similar to Alternative A, but with fewer human-induced impacts from roads, as some roads (93 miles) would be closed to protect sensitive resources.

Alternative D

The impacts would be similar to Alternative A, but with fewer human-induced impacts from roads, as some roads (264 miles) would be closed to protect sensitive resources.

Alternative E

Cumulative impacts of this alternative may include the loss of the Monument's cultural resources from further field research since authorizations would not be issued; the eventual loss of historic buildings in the Monument since they would not be maintained; and a reduced appreciation for the historic associations of the Monument since there would be no interpretation or investigative research.

Alternative F (Preferred Alternative)

The impacts would be similar to Alternative A, but with fewer human-induced impacts from roads, as some roads (216 miles) would be closed to protect sensitive resources.

Fish and Wildlife

Impacts to Fish and Wildlife from Health of the Land and Fire

Fish and Wildlife – Greater Sage-Grouse

Alternative A (Current Management)

Surface disturbances would be prohibited between March 1 and June 30 within 1/4 mile of sage-grouse leks and nesting zones. This would protect 141 acres of breeding habitat from disturbances during breeding periods and facilitate nesting success.

Livestock grazing methods (which may include the termination of grazing by October 31) could be used to maintain sagebrush stands with 15-50% canopy cover and 15" height within 2 miles of sage-grouse leks. This would facilitate nesting success on 21,336 acres of nesting habitat by providing adequate cover.

Alternatives B, C, and D

Prescribed fire and/or mechanical treatments would be allowed to reduce or increase sagebrush cover to desired levels for nesting, brood rearing, breeding habitat, and winter habitat.

Likely nesting habitat within 2 miles of individual sage-grouse leks would be identified by field assessments. Adequate residual herbaceous cover beneath sagebrush within nesting areas would remain at the end of the grazing season to allow adequate cover for next year's nesting.

No supplemental feeding, mineral placement or other livestock congregating function would be allowed in identified active crucial sage-grouse habitat during sensitive seasonal times.

Fencing wet meadows and seeps from livestock grazing would protect late brood-rearing habitats. This could improve brood survival by maintaining a favorable forbs component and insect supply.

Sagebrush habitat would be increased through conversion of crested wheatgrass in selected areas in or near nesting habitat, and native sagebrush would be reseeded in disturbed areas.

High livestock densities would not be allowed in identified active nesting habitat from March 1 to June 15. When conditions are required for sage-grouse security, livestock grazing would not occur in identified active crucial winter habitat (sagebrush canopy of 10-30% and 10-14" height). This could affect 21,336 acres of nesting habitat and 6,866 acres of crucial winter habitat.

Alternative E

Prescribed fire and/or mechanical treatments would be allowed to reduce or increase sagebrush cover to desired levels for nesting, brood rearing, breeding habitat, and winter habitat.

Likely nesting habitat would be identified by field assessments. Adequate residual herbaceous cover beneath sagebrush within nesting areas would remain at the end of the grazing season to allow adequate cover for next year's nesting.

No supplemental feeding, mineral placement or other livestock congregating function would be allowed to occur in identified active crucial sage-grouse habitat during sensitive seasonal times.

Fencing wet meadows and seeps from livestock grazing would protect late brood-rearing habitats. This could improve brood survival by maintaining a favorable forbs component and insect supply.

Acres of sagebrush habitat would be increased through conversion of crested wheatgrass in or near all nesting habitat, and native sagebrush would be reseeded in areas that have been disturbed (e.g., fire).

Livestock grazing would not be allowed in identified sage-grouse nesting habitat from March 1 to June 15. Livestock grazing would not occur in identified crucial winter habitat (sagebrush canopy of 10-30% and 10-14" height) from December 1 to March 31. This could affect 21,336 acres of nesting habitat and 6,866 acres of crucial winter habitat.

Alternative F (Preferred Alternative)

Mechanical treatment would be considered as the primary method and prescribed fire as a secondary method to remove conifers that encroach on sage-grouse habitat, except where forested habitat is limited.

Likely nesting habitat within 2 miles of individual sage-grouse leks would be identified by field assessment. Adequate residual herbaceous cover beneath sagebrush within nesting areas would remain at the end of the grazing season to allow adequate cover for next year's nesting.

Placing salt or mineral supplements near leks would be avoided during the breeding season (March 1-June 15) and supplemental winter feeding of livestock would be avoided, where practical, on sage-grouse winter habitat and around leks.

Fencing wet meadows and seeps from livestock grazing would protect late brood-rearing habitats. This could improve brood survival by maintaining a favorable forbs component and insect supply.

Concentrations of livestock in leks or other key sage-grouse habitats should be discouraged to avoid the potential disturbance or displacement of sage-grouse.

Sage planting would be promoted, where appropriate, within sagebrush habitats. Areas disturbed by treatments (including vegetative conversions such as crested plantings, or surface-disturbing activities) would be reclaimed and/or reseeded when necessary.

Fish and Wildlife - Black-Tailed Prairie Dog Towns

Alternative A (Current Management)

In the West HiLine planning area, prairie dog towns smaller than 10 acres would not be actively managed.

In the Judith-Valley-Phillips planning area, prairie dog towns in Fergus and Chouteau Counties would be maintained or managed based on the values or problems encountered. Prairie dog towns in Phillips County would be maintained at the 1988 survey level.

Alternatives B, C, and D

Prairie dog management would utilize the 2002 Conservation Plan for Black-Tailed and White-Tailed Prairie Dogs in Montana for overall guidance and direction (Montana Prairie Dog Working Group, 2002). Regional plans would be utilized when they are completed.

Prairie dogs towns would be allowed to expand only to the point they would not adversely impact other resources or affect Standards for Rangeland Health.

Alternative E

Prairie dog management would utilize the 2002 Conservation Plan for Black-Tailed and White-Tailed Prairie Dogs in Montana for overall guidance and direction. Regional plans would be utilized when they are completed.

Prairie dogs towns would be allowed to expand in the Monument.

Alternative F (Preferred Alternative)

Prairie dog management would utilize the 2002 Conservation Plan for Black-Tailed and White-Tailed Prairie Dogs in Montana for overall guidance and direction. Regional plans would be utilized when they are completed.

Prairie dogs towns would be allowed to expand only to the point they would not adversely impact other resources or affect Standards of Rangeland Health. Specific actions to address adverse impacts would be addressed through the watershed planning process.

Fish and Wildlife – Mitigation

This section addresses the effects overall for the Monument.

Alternative A (Current Management)

Greater Sage-Grouse – Mitigation for sage-grouse includes no surface use within 500 feet of sage-grouse strutting grounds and special care to avoid nesting areas associated with strutting grounds from March 1 to June 30 and crucial sage-grouse winter ranges from December 1 to May 15. This would affect 6,866 acres of crucial habitat.

Black-Tailed Prairie Dogs – Not allowing surface disturbance within 1/4 mile of prairie dog towns could adequately mitigate black-tailed prairie dogs and other sensitive status species associated with prairie dog towns. This would involve 3,932 acres.

Designated Sensitive Species – Surface-disturbing activities may be controlled or excluded within 200 meters of the proposed activity or the activity delayed 60 days. This alternative could protect sensitive status raptors by relocating surface disturbances or postponing activities during sensitive nesting periods, and it could protect raptors by repositioning the activity. Other sensitive species would be exposed to fewer disturbances and incidental mortality due to mechanical disturbance or vehicle strikes, which could promote better breeding success and species survival within the area.

Bald Eagle – Surface uses may be controlled or excluded within 1/4 mile of identified essential habitat of the bald eagle. This would affect three known bald eagle nests and 37 acres. This mitigation may promote successful nests, but a defined time and buffer may be of benefit when mitigating future surface disturbances.

Big Game Winter Range – Not allowing surface disturbance from December 1 to May 15 during severe winters would prevent additional disturbance of wintering big game during a period of physical stress. This would affect 231,885 acres of deer and elk winter range and 26,700 acres of crucial antelope winter range.

Bighorn Sheep Distribution – Surface-disturbing activities may be controlled or excluded within 200 meters of the proposed activity or the activity delayed 60 days.

Bighorn Sheep Lambing Areas – Surface-disturbing activities may be controlled or excluded within 200 meters of identified habitat or the activity delayed 60 days.

Alternative B

Greater Sage-Grouse – Mitigation for sage-grouse would include no surface disturbance on identified sage-grouse winter habitat from December 1 to March 31 (6,866 acres), no surface disturbance in identified nesting areas within 2 miles of sage-grouse leks (21,336 acres), and no surface use within 1/4 mile of a sage-grouse lek (141 acres). This would prevent additional disturbance of wintering sage-grouse during a period of physical stress.

Black-Tailed Prairie Dogs – Prohibiting surface disturbances on prairie dog towns could preserve prairie dogs and associated sensitive status species inhabiting prairie dog towns. This would involve 507 acres.

Designated Sensitive Species – The impacts would be the same as Alternative A.

Bald Eagle – Prohibiting surface disturbance within 1 mile of active winter roosting areas from November 15 to February 29, and within 1 mile of nests from February 1 to July 31, could protect wintering bald eagles and improve nest success. This would affect three known bald eagle nests and 436 acres and would prevent additional disturbance of wintering bald eagles during periods of physical stress.

Big Game Winter Range – Prohibiting surface disturbances on identified winter ranges between December 1 and March 31 would prevent additional disturbance of wintering big game during a period of physical stress. Big game species could experience improved survival due to the reduced stress. This would affect 231,885 acres of deer and elk winter range and 26,700 acres of crucial antelope winter range.

Bighorn Sheep Distribution – The impacts would be the same as Alternative A.

Bighorn Sheep Lambing Areas – Prohibiting surface disturbances in identified bighorn sheep lambing areas between April 1 and June 15 could reduce stress to ewes during parturition and protect lambs when they are most susceptible. This mitigation could improve lamb survival and maintain or improve populations within the available habitat. This would involve 49,193 acres.

Alternative C

Greater Sage-Grouse – The impacts would be the same as Alternative B.

Black-Tailed Prairie Dogs – Prohibiting or minimizing surface disturbances on prairie dog towns could preserve prairie dogs and associated sensitive status species inhabiting prairie dog towns. This would involve 507 acres.

Designated Sensitive Species – Because surface-disturbing activities could be controlled or excluded within identified crucial habitat or within 1/4 mile of active nests, sensitive species raptors may have improved nesting success. Other sensitive species would be exposed to fewer disturbances

and incidental mortality due to mechanical disturbance or vehicle strikes. This could promote better breeding success and species survival within the area.

Bald Eagle – Prohibiting surface disturbance within 1/2 mile of any nest that has been active within the last 7 years could improve nesting success. This would affect three known bald eagle nests and 133 acres.

Big Game Winter Range – The impacts would be the same as Alternative B.

Bighorn Sheep Distribution – Prohibiting surface disturbances on identified bighorn sheep distribution between December 1 and March 31, would prevent additional disturbance of wintering bighorn sheep during a period of physical stress. This would involve 134,639 acres.

Bighorn Sheep Lambing Areas – The impacts would be the same as Alternative B.

Alternative D

Greater Sage-Grouse – The impacts would be the same as Alternative B.

Black-Tailed Prairie Dogs – Prohibiting adverse surface-disturbing activities within 1/4 mile of prairie dog towns could preserve prairie dogs and associated sensitive status species inhabiting prairie dog towns. This would involve 3,932 acres.

Designated Sensitive Species – Because surface-disturbing activities could be controlled or excluded within identified crucial habitat or within 1/4 mile of active nests, sensitive species would be exposed to fewer disturbances and incidental mortality due to mechanical disturbance or vehicle strikes. This could promote better breeding success and species survival within the area.

Identified special status species raptors may have improved nesting success if surface-disturbing activities were prohibited from March 1 to August 1 within 1/2 mile of active nests. This mitigation would promote better breeding, nesting success, and species survival and productivity within the area.

Bald Eagle – Prohibiting surface disturbance within 1/2 mile of any nest that has been active within the last 7 years and within riparian nesting habitat could improve nesting success and preserve potential nesting habitat. This would affect three known bald eagle nests and 133 acres.

Big Game Winter Range – The impacts would be the same as Alternative A.

Bighorn Sheep Distribution – The impacts would be the same as Alternative C.

Bighorn Sheep Lambing Areas – Prohibiting surface disturbances within identified bighorn sheep lambing areas could improve lamb survival, reduce stress throughout the year, and maintain or improve populations within the available habitat. This would involve 49,193 acres.

Alternative E

Greater Sage-Grouse – Not allowing surface disturbance on identified sage-grouse winter habitat (6,866 acres) and within 2 miles of sage-grouse leks (21,336 acres) would prevent additional disturbance of wintering sage-grouse during periods of physical stress.

Black-Tailed Prairie Dogs – The impacts would be the same as Alternative D.

Designated Sensitive Species – Because surface-disturbing activities could be controlled or excluded within identified crucial habitat or within 1/2 mile of active nests, sensitive species raptors may have improved nesting success. Other sensitive species would be exposed to fewer disturbances and incidental mortality due to mechanical disturbance or vehicle strikes. This could promote better breeding success and species survival within the area.

Bald Eagle – The impacts would be the same as Alternative D.

Big Game Winter Range – Prohibiting surface disturbances on identified winter ranges would prevent additional disturbance of wintering big game during a period of physical stress. Big game species could experience improved survival due to the reduced stress. This would involve 231,885 acres of deer and elk winter range and 26,700 acres of crucial antelope winter range.

Bighorn Sheep Distribution – Prohibiting surface disturbances on identified bighorn sheep distribution areas would prevent additional disturbance of bighorn sheep during a period of physical stress. This would affect 134,639 acres.

Bighorn Sheep Lambing Areas – Prohibiting surface disturbances within 1 mile of identified bighorn sheep lambing areas could improve lamb survival, reduce stress throughout the year, and maintain or improve populations within the available habitat. This would involve 103,366 acres.

Alternative F (Preferred Alternative)

Greater Sage-Grouse – Mitigation for sage-grouse would include no surface disturbance on identified sage-grouse winter habitat from December 1 to March 31 (6,866 acres),

no surface disturbance in identified nesting areas between March 1 to June 15 within 2 miles of sage-grouse leks (21,336 acres), and no surface use within 1/4 mile of a sage-grouse lek (141 acres). This would prevent additional disturbance of wintering sage-grouse during a periods of physical stress. Where needed as additional mitigation to potential impacts, compensatory mitigation may be used to replace important habitat loss.

Black-Tailed Prairie Dogs – Prohibiting adverse surface-disturbing activities within 1/4 mile of prairie dog towns could reduce potential long-term impacts to prairie dogs and associated sensitive status species inhabiting prairie dog towns. This would involve 3,932 acres.

Designated Sensitive Species – Surface-disturbing activities could be controlled or excluded within 1/4 mile of the activity or within 1/2 mile of ferruginous hawk nests. The surface-disturbing activity could also be delayed 90 days. Other sensitive species would be exposed to fewer disturbances and incidental mortality due to mechanical disturbance or vehicle strikes. This would promote better breeding, nesting success, and species survival and productivity within the area.

Bald Eagle – Prohibiting surface disturbance within 1/2 mile of a nest that has been active within the last 7 years, if the disturbance could cause nest abandonment or failure, could improve nesting success and preserve potential nesting habitat. This would affect three known bald eagle nests and 133 acres. This alternative does not protect winter roosting areas, and disturbance on winter roosting habitat could cause additional energy loss and reduced productivity.

Big Game Winter Range – Prohibiting surface disturbances between December 1 and March 31 on identified winter ranges would prevent additional disturbance of wintering big game during a period of physical stress. Big game species could experience improved survival due to the reduced stress. This would affect 231,885 acres of deer and elk winter range and 26,700 acres of crucial antelope winter range.

Bighorn Sheep Distribution – Prohibiting surface disturbances on identified bighorn sheep distribution between December 1 and March 31 would prevent additional disturbance of wintering bighorn sheep during a period of physical stress. This would affect 134,639 acres.

Bighorn Sheep Lambing Areas – Prohibiting surface disturbances in identified bighorn sheep lambing areas between April 1 and June 15 could reduce stress to ewes during parturition and protect lambs when they are most susceptible. This mitigation could improve lamb survival and maintain or improve populations within the available habitat. This would affect 49,193 acres.

Vegetation

Alternative A (Current Management)

No wildlife impacts would be expected.

Alternatives B, C, and D

Pallid sturgeon could directly benefit from coordination with other agencies to allow for high water events to stimulate riparian regeneration. An increase in water flows and temperatures may trigger spawning.

Restoration of native vegetation would benefit numerous wildlife species, including designated sensitive species, and migratory and neo-tropical birds.

Alternative E

Restoration of native vegetation would benefit numerous wildlife species, including designated sensitive species, and migratory and neo-tropical birds.

Alternative F (Preferred Alternative)

Pallid sturgeon could directly benefit from coordination with other agencies to allow for high water events to stimulate riparian regeneration. An increase in water flows and temperatures may trigger spawning.

Restoration of native upland vegetation would benefit numerous wildlife species, including designated sensitive species, and migratory and neo-tropical birds.

Emphasizing riparian habitat restoration and protection would benefit migratory and neo-tropical birds, 80% of which utilize riparian habitats during breeding season or migration.

Range Improvements

Alternative A (Current Management)

New fence projects would follow standard wildlife specifications for fence installation. In some areas, current management allows for water development on terminal ridges which may lead to excessive competition between livestock and wildlife in important wildlife habitat.

Alternatives B, C, D, and E

Existing fences would be adjusted to accommodate wildlife, and unnecessary or abandoned fences would be removed. This could benefit wildlife where fences are a barrier to wildlife. Using three- versus four-wire fences would lessen barriers to wildlife movement.

Water developments would be considered on a site-specific basis. This could protect wildlife by reducing livestock/wildlife conflicts in key wildlife habitats. Some species (elk, amphibians, and some bat and bird species) would benefit from additional water sources and wetland habitat.

Alternative F (Preferred Alternative)

Existing fences would be adjusted to accommodate wildlife, and unnecessary or abandoned fences would be removed. This could benefit wildlife where fences are a barrier to wildlife. Using three- versus four-wire fences would lessen barriers to wildlife movement.

Water developments would be considered on a site-specific basis. This could protect wildlife by reducing livestock/wildlife conflicts in key wildlife habitats. Restricting reservoir or pit construction on existing wetlands and riparian areas would protect wildlife species such as amphibians, shorebirds and possibly sage-grouse which depend on these existing wetlands. Some species (elk, amphibians, and some bat and bird species) would benefit from additional water sources and wetland habitat.

Land Ownership Adjustment

Alternative A (Current Management)

No wildlife impacts would be expected.

Alternatives B, C, D, E, and F (Preferred Alternative)

The proposed exchange would potentially change the management of both the disposal and acquisition tracts. The BLM land proposed for disposal has been farmed in the past, and has good potential for being farmed again. The private land and cottonwood grove on it are already being used, without permission, by river floaters for camping, and the BLM would likely establish an official campsite at this location.

If the BLM disposal tract is not farmed there would likely be no impact to wildlife from the exchange. Farming the disposal tract would replace permanent vegetative cover with limited forage values, with either a small grain crop or alfalfa. Both options would provide abundant forage for some species of wildlife, including game and non-game birds, whitetail and mule deer. Nesting cover for birds, escape cover and habitat for rodents, reptiles and amphibians would be reduced as permanent cover is removed by harvest and crop seeding. Due to the abundance of native upland and riparian cover adjacent to this tract, impacts to wildlife would be limited by any change in management of this tract.

If no improvements are made to the acquisition tract, and it is not designated a public campsite, the level of use would likely continue at or near current levels. There would be no additional impacts to wildlife or wildlife habitat. If the BLM designates a portion of the acquisition tract (the cottonwood grove) as a campsite, use levels and impacts would increase depending on the level of upgrades. Impacts to wildlife would include loss of habitat, security, migratory bird nesting and feeding areas. These impacts would depend on the level of upgrades and increase in public use. Any developed campground proposal would require site-specific National Environmental Policy Act (NEPA) analysis to determine suitability and mitigation of potential impacts.

Wild and Scenic Rivers

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

There would be no impact to wildlife, as there would be no changes to the management of the BLM land that would affect vegetation and wildlife habitat.

Impacts to Fish and Wildlife from Visitor Use, Services and Infrastructure

Recreation

Alternative A (Current Management)

Camping on islands on the Missouri River would be discouraged from April 1 to July 31 to protect waterfowl nests and promote successful nesting.

The personal collection of shed antlers (horn hunting) would remain unrestricted throughout the Monument. Although it is not currently a significant impact to wildlife, there would be potential human/big game conflicts during sensitive times of the year as shed hunting continues to become more popular.

Alternative B

Camping on islands would be allowed and may create an impact to waterfowl nests. Nesting waterfowl may abandon nests, resulting in reduced hatch and lower productivity.

Collecting shed antlers (horn hunting) would have the same impact as Alternative A.

Alternative C

Camping on islands would have the same impact as Alternative B.

Collecting shed antlers (horn hunting) would be prohibited from December 1 to March 31, which could reduce human/big game conflicts that could arise when animals may be stressed from winter conditions.

Alternative D

Camping on islands on the Missouri River would not be allowed from April 1 to July 31. Seasonal timing restrictions for island camping would protect nesting areas and improve nesting successes.

The personal collection of shed antlers (horn hunting) could be prohibited from December 1 to May 15, if necessary. This closure could allow improved big game survival due to reduced stress, and the extended time could benefit affected species during extended winters.

Alternative E

A no-camping restriction on islands would protect nesting areas and improve nesting success.

Prohibiting the collection of shed antlers (horn hunting) could decrease human/big game conflicts not only during crucial times of the year, but also reduce yearlong conflicts as shed hunting becomes more popular.

Alternative F (Preferred Alternative)

Camping on islands on the Missouri River would not be allowed from April 1 to July 31. This seasonal restriction for island camping would protect nesting areas and improve nesting successes.

The personal collection of shed antlers (horn hunting) would be unrestricted throughout the Monument, although a seasonal restriction (December 1 to March 31) could be implemented to protect big game from excessive disturbance if there is a negative impact from human intrusion during sensitive winter time periods.

Upper Missouri River Special Recreation Management Area (SRMA)

Alternative A (Current Management)

Existing recreation use levels and campsites may displace wildlife during floating and hunting seasons.

Alternative B

By providing additional Level 1, 2, and 3 sites, wildlife may become displaced from valuable wildlife habitat. The additional use may diminish the existing wildlife habitat and may permanently displace wildlife as the natural habitat deteriorates.

Alternative C

The impacts would be the same as Alternative A.

Alternative D

Additional Level 2 and 3 sites could be constructed. This could impact wildlife, if the sites are created in valuable wildlife habitats such as cottonwood galleries or important riparian zones, by impacting understory and hardening sites which may, in turn, impact cottonwood rejuvenation. This could impact many species, including raptors, migratory and neo-tropical birds, bats, reptiles, amphibians, and mule and whitetail deer.

Alternative E

With only additional Level 3 sites, there could be less of an impact to wildlife than Alternatives A, B, C, and D. Although these additional sites may temporarily displace wildlife, they are less likely to permanently impact wildlife. The level of disturbance would depend on the level of use during crucial times for wildlife and the level of habitat alteration caused by human impacts.

Alternative F (Preferred Alternative)

Additional Level 1, 2, and 3 sites could be constructed. This could impact wildlife, if the sites are created in valuable wildlife habitats such as cottonwood galleries or important riparian zones, by impacting understory and hardening sites which may, in turn, impact cottonwood rejuvenation. This could impact many species, including raptors, migratory and neo-tropical birds, bats, reptiles, amphibians, and mule and whitetail deer.

Uplands Special Recreation Management Area (SRMA)

Alternative A (Current Management)

All camping is dispersed and there would be no developed camping facilities. This may benefit wildlife since there would be few areas disrupted from extended use.

Alternative B

Because there would be an opportunity to construct Level 1, 2, and 3 sites, there could be a loss of wildlife habitat, particularly if Level 1 and 2 sites were developed close to reservoirs and other valuable wildlife habitats.

Alternative C

Because Level 1 sites would be constructed only at the beginning of public access roads into the Monument, the most crucial wildlife habitat would not be impacted.

Alternative D

Level 1 sites would be prohibited and Level 2 facilities would only be located on existing main artery roads. Impacts to wildlife would be located where there is less identified crucial habitat. This would benefit wildlife, since concentrations of campers would not be located within some of the upland areas of the Monument.

Alternative E

Level 1 and 2 sites would be prohibited, which would benefit wildlife, as camping opportunities would be dispersed and impact wildlife less than concentrations of recreationists. Impacts to wildlife would be relocated outside of the Monument, where there is less identified big game winter habitat. Impacts would be reduced for big game species, but would be the same or greater for species dependent on that habitat near the edge of the Monument.

Alternative F (Preferred Alternative)

Because Level 1 sites would only be constructed at the beginning of public access roads into the Monument, less big game winter habitat would be impacted. Impacts to wildlife would be relocated outside and to the edge of the Monument, where there is less identified big game winter habitat. Impacts would be reduced for big game species, but would be the same or greater for species dependent on that habitat outside or at the edge of Monument.

Impacts to Fish and Wildlife from Natural Gas Exploration and Development

Oil and Gas Leases (Stipulations and Conditions of Approval)

Alternative A (Current Management)

Greater Sage-Grouse – On the West HiLine oil and gas leases, surface-disturbing activities may be controlled or excluded within 1/4 mile of identified sage-grouse leks, and surface use may be restricted or excluded during the nesting period from March 1 to June 30, and within crucial winter habitat from December 1 to May 15. This would affect identified nesting habitat and 441 acres of crucial winter habitat (Table 4.4).

Most non-West HiLine leases have no stipulations beyond the standard lease terms of moving activities 200 meters or detaining activities up to 60 days. Conditions of approval would be considered on a case-by-case basis during the permitting process for applications for permit to drill (APDs) but without adequate conditions in some areas, leks could be abandoned and nesting zones disrupted.

Black-Tailed Prairie Dogs – Surface use on the West HiLine leases may be restricted or excluded within 1/4 mile of special status species. This could adequately protect black-tailed prairie dogs and other sensitive status species associated with prairie dog towns and would involve 72 acres of prairie dog towns (Table 4.4).

Most non-West HiLine leases have no stipulations beyond the standard lease terms of moving activities 200 meters or detaining activities up to 60 days. Conditions of approval would be considered on a case-by-case basis during the permitting process for APDs. The leases with only standard lease terms may only adequately protect prairie dogs and prairie dog town associated sensitive status species if the acreage is low enough that 200 meters is sufficient to move the disturbance off the prairie dog town. The 60-day delay may offer temporary protection, but may impact prairie dogs and sensitive status species in subsequent years.

Designated Sensitive Species – Surface use on the West HiLine leases may be restricted or excluded within 1/4 mile of special status species, which would involve 3 acres (Table 4.4). The Rocky Mountain Guidelines are used to recommended nest buffers for various activities and range from 1/4 mile to 3 miles. Because these are only recommendations, they may be altered due to vegetation, topography, or nesting cycle time period. This stipulation may promote successful nests, but a defined time and buffer may be of benefit when mitigating future surface disturbances.

Most non-West HiLine leases have no stipulations beyond the standard lease terms of moving activities 200 meters or detaining activities up to 60 days. Conditions of approval would be considered on a case-by-case basis during the permitting process for APDs. This could protect sensitive status raptors by relocating surface disturbances or postponing activities during sensitive nesting periods. This may not provide adequate, long-term protection for sensitive raptor species. Other sensitive species would be exposed to fewer disturbances and incidental mortality due to mechanical disturbance or vehicle strikes. This could promote better breeding success and species survival.

Bald Eagle – Surface use on the West HiLine leases may be restricted or excluded within 1/4 mile of special status species. There are no known bald eagle nests within 1/4 mile of the West HiLine leases. This stipulation may promote successful nests, but a defined time and buffer may be of benefit when mitigating future surface disturbances.

Most non-West HiLine leases have no stipulations beyond the standard lease terms of moving activities 200 meters or detaining activities up to 60 days. Conditions of approval would be considered on a case-by-case basis during the permitting process for APDs.

Big Game Winter Range – Surface use on the West HiLine leases may be restricted or excluded from December 1 to May 15, during severe winters. This would involve 6,986 acres of deer and elk winter range and 2,561 acres of antelope crucial winter range (Table 4.4). This would prevent additional disturbance of wintering big game during a period of physical stress.

Most non-West HiLine leases have no stipulations beyond the standard lease terms of moving activities 200 meters or detaining activities up to 60 days. Conditions of approval would be considered on a case-by-case basis during the permitting process for APDs. Standard lease terms would not protect big game on winter range, and in some areas big game species could be distressed by additional activities.

Bighorn Sheep Distribution – For all the leases, surface-disturbing activities may be controlled or excluded within 200 meters of the proposed activity or the activity delayed 60 days. This would involve 14,244 acres of bighorn sheep distribution (Table 4.4).

Bighorn Sheep Lambing Areas – For all the leases, surface-disturbing activities may be controlled or excluded within 200 meters of the proposed activity or the activity delayed 60 days. This would involve 6,563 acres of bighorn sheep lambing areas (Table 4.4).

Alternative B

Greater Sage-Grouse – A condition of approval would be attached to each APD which requires no surface disturbance on identified sage-grouse crucial winter habitat from December 1 to March 31, no surface disturbance in identified nesting areas within 2 miles of sage-grouse leks, and no surface use within 1/4 mile of a sage-grouse lek. This would involve 31 acres near the leks, 5,774 acres of nesting habitat, and 441 acres of crucial winter habitat (Table 4.4). This would prevent additional disturbance of wintering sage-grouse during a periods of physical stress.

Black-Tailed Prairie Dogs— A condition of approval would be attached to each APD which would prohibit surface disturbances on prairie dog towns. This would affect 72 acres of prairie dog towns (Table 4.4) and could preserve prairie dogs and the associated sensitive status species inhabiting prairie dog towns.

Designated Sensitive Species – Surface-disturbing activities may be controlled or excluded within 200 meters of the proposed activity or the activity delayed 60 days. This could protect sensitive status raptors by relocating surface disturbances or postponing activities during sensitive nesting periods. This may not provide adequate, long-term protection for sensitive raptor species. Other sensitive

Table 4.4
Wildlife Habitat within the Oil and Gas Leases in the Monument

Wildlife Habitat	*West HiLine Leases (Acres)*	*Non-West HiLine Leases (Acres)*	*Total (Acres)*
Greater Sage-Grouse			
Lek (1/4-mile restriction)	0	31	31
Nesting Area (2-mile restriction)	1,276	4,498	5,774
Crucial Winter Range	441	0	441
Black-Tailed Prairie Dogs	72	0	72
Designated Sensitive Species			
1/4-mile restriction	3	532	535
1/2-mile restriction	71	2,117	2,188
Deer and Elk Winter Range	6,986	19,137	26,123
Antelope Crucial Winter Range	2,561	3,588	6,149
Bighorn Sheep Distribution	3,080	11,164	14,244
Bighorn Sheep Lambing Areas	1,059	5,504	6,563
(1-mile restriction)	3,192	10,358	13,550

species would be exposed to fewer disturbances and incidental mortality due to mechanical disturbance or vehicle strikes. This could promote better breeding success and species survival within the area.

Bald Eagle – A condition of approval would be attached to each APD which prohibits surface disturbance within 1 mile of active winter roosting areas from November 15 to February 29, and within 1 mile of nests from February 1 to July 31, if the disturbance could cause nest abandonment or failure. There are no known bald eagle nests within 1 mile of the oil and gas leases. This could provide protection for wintering bald eagles and improve nest success and would prevent additional disturbance of wintering bald eagles during a period of physical stress. Bald eagles are susceptible to disturbance during winter roosting in severe weather and temperatures.

Big Game Winter Range – A condition of approval would be attached to each APD which prohibits surface disturbances on identified winter ranges between December 1 and March 31. This would prevent additional disturbance of wintering big game during a period of physical stress. Big game species could experience improved survival due to the reduced stress. This would involve 26,123 acres of deer and elk winter range and 6,149 acres of antelope crucial winter range (Table 4.4).

Bighorn Sheep Distribution – The impacts would be the same as Alternative A.

Bighorn Sheep Lambing Areas – A condition of approval would be attached to each APD which prohibits surface disturbances in identified bighorn sheep lambing areas between April 1 and June 15. This could reduce stress to ewes during parturition and protect lambs when they are most susceptible. This mitigation could improve lamb survival and maintain or improve populations within the available habitat. This would affect 6,563 acres of bighorn sheep lambing areas (Table 4.4).

Alternative C

G*reater Sage-Grouse* – The impacts would be the same as Alternative B.

Black-Tailed Prairie Dogs – A condition of approval would be attached to each APD which prohibits or minimizes surface disturbances on prairie dog towns. This could preserve prairie dogs and the associated sensitive status species inhabiting prairie dog towns. This would affect 72 acres of prairie dog towns (Table 4.4).

Designated Sensitive Species – A condition of approval would be attached to each APD which prohibits surface-disturbing activities within identified crucial habitat or within 1/4 mile of active nests. This would affect 535 acres (Table 4.4). Sensitive species raptors may have improved nesting success. Other sensitive species would be exposed to fewer disturbances and incidental mortality due to mechanical disturbance or vehicle strikes. This could promote better breeding success and species survival within the area.

Bald Eagle – A condition of approval would be attached to each APD which prohibits surface disturbance within 1/2 mile of any nest that has been active within the last 7 years. There are no known bald eagle nests within 1/2 mile of the oil and gas leases.

Big Game Winter Range – The impacts would be the same as Alternative B.

Bighorn Sheep Distribution – A condition of approval would be attached to each APD which prohibits surface disturbances on identified bighorn sheep distribution areas between December 1 and March 31. This would affect 14,244 acres (Table 4.4) and would prevent additional disturbance of wintering bighorn sheep during a period of physical stress.

Bighorn Sheep Lambing Areas – The impacts would be the same as Alternative B.

Alternative D

G*reater Sage*-Grouse – The impacts would be the same as Alternative B.

Black-Tailed Prairie Dogs – A condition of approval would be attached to each APD which prohibits adverse surface-disturbing activities within 1/4 mile of prairie dog towns. This could preserve prairie dogs and associated sensitive status species inhabiting prairie dog towns.

Designated Sensitive Species – A condition of approval would be attached to each APD which prohibits surface-disturbing activities within identified crucial habitat or within 1/4 mile of active nests (535 acres) and from March 1 to August 1, within 1/2 mile of active nests (2,188 acres) (Table 4.4). Special status species raptors may have improved nesting success. This would promote better breeding, nesting success, and species survival and productivity within the area.

Bald Eagle – A condition of approval would be attached to each APD which prohibits surface disturbance within 1/2 mile of any nest that has been active within the last 7 years and within riparian nesting habitat. There are no known bald eagle nests within 1/2 mile of the oil and gas leases. This could improve nesting success and preserve potential nesting habitat.

Big Game Winter Range – The impacts would be the same as Alternative A.

Bighorn Sheep Distribution – The impacts would be the same as Alternative C.

Bighorn Sheep Lambing Areas – A condition of approval would be attached to each APD which prohibits surface disturbances within 1 mile of identified bighorn sheep lambing areas. This would involve 13,550 acres of bighorn sheep lambing areas and could improve lamb survival, reduce stress throughout the year, and maintain or improve populations within the available habitat.

Alternative E

There would be no impact to wildlife since surface disturbance would be prohibited on the oil and gas leases in the Monument.

Alternative F (Preferred Alternative)

Greater Sage-Grouse – The impacts would be the same as Alternative B.

Black-Tailed Prairie Dogs – The impacts would be the same as Alternative D.

Designated Sensitive Species – Surface-disturbing activities may be controlled or excluded within 1/4 mile of the activity or the activity delayed 90 days. Also, surface disturbance would be prohibited from March 1 to August 1 within 1/2 mile of active ferruginous hawk nest sites. Other sensitive species would be exposed to fewer disturbances and incidental mortality due to mechanical disturbance or vehicle strikes. This would promote better breeding, nesting success, and species survival and productivity within the area.

Bald Eagle – A condition of approval would be attached to each APD which prohibits surface disturbance within 1/2 mile of any nest that has been active within the last 7 years, if the disturbance could cause nest abandonment or failure. There are no known bald eagle nests within 1/2 mile of the oil and gas leases. This alternative does not protect winter roosting areas, and disturbance on winter roosting habitat could cause additional energy loss and reduced productivity.

Big Game Winter Range – The impacts would be the same as Alternative B.

Bighorn Sheep Distribution – The impacts would be the same as Alternative C.

Bighorn Sheep Lambing Areas – The impacts would be the same as Alternative B.

Natural Gas Operations

Alternative A (Current Management)

Seismic – Seismic activities would be subject to wildlife mitigation measures. Cross-country seismic activity would temporarily displace wildlife and disturb habitat.

Drilling Operations – Currently, two wells per section are allowed within the Leroy Gas Field and one well per section is allowed within the Sawtooth Mountain Gas Field. These allowances may be increased to maximize natural gas extraction. If additional wells were allowed per section, there would be additional impacts to wildlife since additional surface disturbance would occur and additional roads and well pads would be constructed. It is reasonably foreseeable 35 natural gas wells could be drilled on the existing leases in the Monument.

All roads used for natural gas operations would be open without restrictions. This would allow existing impacts to wildlife with additional impacts caused by new resource roads (10.1 miles) and any increase in traffic. Impacts would include additional disturbances from traffic, and fragmentation and reduced acreage of wildlife habitat.

Production Facilities and Equipment – Cross-country pipelines would be permitted. It is reasonably foreseeable 3.5 miles of pipelines would be associated with new natural gas wells, which would cause short-term disturbance and habitat loss due to the surface-disturbing activity.

Water disposal would follow standard operating procedures. There would be no constraint for water production, so water hauling may occur without restrictions. This would impact wildlife species such as elk, bighorn sheep and other big game during sensitive times of the year (parturition, winter range use).

Standard operating procedures and BMPs would be followed for general production facilities and equipment.

Alternative B

Seismic – Seismic activities would be subject to wildlife mitigation measures. Cross-country seismic activity would temporarily displace wildlife and disturb habitat.

Drilling Operations – The BLM would recommend that no more than four well sites be allowed per section. Wildlife would be impacted if additional well pads and roads were permitted. This would cause additional disturbances from traffic, and fragmentation and reduced acreage of wildlife habitat. It is reasonably foreseeable 44 natural gas wells could be drilled on the existing leases in the Monument.

All roads used for natural gas operations would be open without restrictions. This would allow existing impacts to wildlife with additional impacts caused by new resource roads (17.4 miles) and any increase in traffic. The impacts would include additional disturbances from traffic, and fragmentation and reduced acreage of wildlife habitat.

Production Facilities and Equipment – Cross-country pipelines would be permitted. It is reasonably foreseeable 6.1 miles of pipelines would be associated with new natural gas wells, which would cause short-term disturbance and habitat loss.

Pits may be constructed to a size dependent on water production, but a maximum of two trips per month would be authorized if excess water is hauled off site. By limiting the number of vehicle trips during sensitive times of the year (parturition, winter range use), wildlife species such as elk, bighorn sheep and other big game could be protected from additional vehicular travel. Larger pits would disturb additional habitat and may attract waterfowl and other birds, which could be affected by the water quality. As pits have to be fenced to protect wildlife, a larger barrier would affect wildlife movement and use of the area.

Best Management Practices would be utilized to ensure the noise levels would be within acceptable limits to wildlife. This would protect species that may be sensitive to noise such as breeding sage-grouse, breeding and nesting migratory birds, wintering big game, sage-grouse habitats, and yearlong bighorn sheep areas.

Alternative C

Seismic – Seismic exploration would only be permitted on designated roads, which would protect wildlife species and habitat sensitive to human disturbance, over large portions of the Monument.

Drilling Operations – Currently, two wells per section are allowed within the Leroy Gas Field and one well per section is allowed within the Sawtooth Mountain Gas Field. These allowances may be increased to maximize gas extraction. If additional wells were allowed per section, there would be additional impacts to wildlife since additional surface disturbance would occur and additional roads and well pads would be constructed. It is reasonably foreseeable 28 natural gas wells could be drilled on the existing leases in the Monument.

By restricting travel to the minimal vehicle required and possible timing restrictions, the impacts to wildlife near the existing natural gas resource roads would be reduced. Impacts to wildlife would still occur, including habitat fragmentation, additional disturbances from traffic and reduced wildlife habitat on new resource roads (7.4 miles).

Production Facilities and Equipment – Pipelines would only be permitted within existing disturbances or the location that is least intrusive. It is reasonably foreseeable 2.6 miles of pipelines would be associated with new natural gas wells. This would reduce potential impacts to wildlife habitat, as the surface disturbance would be minimal, would avoid important riparian areas, and the duration of construction would be short-term.

Pits may be constructed to a size dependent on water production, but a maximum of two trips per month would be authorized if excess water is hauled off site. By limiting the number of vehicle trips during sensitive times of the year (parturition, winter range use), wildlife species such as elk, bighorn sheep and other big game could be protected from additional vehicular travel. Larger pits would disturb additional habitat and may attract waterfowl and other birds, which could be affected by the water quality. As pits have to be fenced to protect wildlife, a larger barrier would affect wildlife movement and use of the area.

Best Management Practices would be utilized to ensure the noise levels are within acceptable limits to wildlife. This would protect species that may be sensitive to noise such as breeding sage-grouse, breeding and nesting migratory birds, wintering big game, sage-grouse habitats, and yearlong bighorn sheep areas.

Alternative D

Seismic – Only helicopter-supported exploration activities would be permitted off road and exploration on existing roads would be restricted to gravitational exploration. Although wildlife and wildlife habitat may be impacted less by restricting cross-country travel, low flying aircraft could impact wildlife during breeding, parturition, or while utilizing winter range.

Drilling Operations – The impacts would be similar to Alternative C, except changes, exceptions, or modifications for spacing would not be allowed. This may benefit wildlife with less habitat fragmentation and disturbances from traffic. It is reasonably foreseeable 13 natural gas wells could be drilled on the existing leases in the Monument.

By restricting travel to the minimal vehicle required and possible timing restrictions, the impacts to wildlife near the existing natural gas resource roads would be reduced. Impacts to wildlife would still occur, including habitat fragmentation, additional disturbances from traffic and reduced wildlife habitat on new resource roads (0.4 miles).

Production Facilities and Equipment – Pipelines would follow existing disturbances or access roads. It is reasonably foreseeable 0.1 miles of pipelines would be associated

with new natural gas wells. This would cause no additional wildlife habitat loss, and would reduce potential impacts to wildlife habitat as the surface disturbance would be minimal and the duration of construction would be short-term.

Wells would be limited to producing no more than five barrels of water per day, and water hauling equipment would be prohibited. Since water transport by vehicle would be prohibited, wildlife species such as elk, bighorn sheep and other big game could be protected from additional vehicular travel. Water pits would disturb habitat and may attract waterfowl and other birds, which could be affected by the water quality. As pits have to be fenced to protect wildlife, this barrier would have some effect on wildlife movement and use of the area.

Best Management Practices would be utilized to ensure the noise levels are within acceptable limits to wildlife. This would protect species that may be sensitive to noise such as breeding sage-grouse, breeding and nesting migratory birds, wintering big game, sage-grouse habitats, and yearlong bighorn sheep areas.

Alternative E

Seismic – Only helicopter-supported exploration activities would be permitted off road and exploration on existing roads would be restricted to gravitational exploration. Although wildlife and wildlife habitat may be impacted less by restricting cross-country travel, low flying aircraft could impact wildlife during breeding, parturition, or while utilizing winter range.

Drilling Operations – Wildlife would be exposed to fewer impacts with spacing reduced to one well per section. Surface disturbances would be reduced and fewer human/wildlife conflicts may occur. If changes, exceptions, or modifications would be permitted, this would cause additional habitat fragmentation to wildlife, additional disturbances from traffic, as well as reducing wildlife habitat. However, it is reasonably foreseeable that no natural gas wells would be drilled on the existing leases in the Monument.

Production Facilities and Equipment – If natural gas wells were drilled and production occurred, pipelines would follow existing disturbances or access roads. This would cause no additional wildlife habitat loss and would reduce potential impacts to wildlife habitat, as the surface disturbance would be minimal and the duration of construction would be short term.

Any wells would be limited to producing no more than five barrels of water per day and water hauling equipment would be prohibited. Since water transport by vehicle would be prohibited, wildlife species such as elk, bighorn sheep and other big game could be protected from additional vehicular travel. Water pits would disturb habitat and may attract waterfowl and other birds, which could be affected by the water quality. As pits have to be fenced to protect wildlife, this barrier would have some effect on wildlife movement and use of the area.

Best Management Practices and Best Available Control Technology (BACT) would be utilized to ensure noise levels are within acceptable limits to wildlife. This would protect species that may be sensitive to noise such as breeding sage-grouse, breeding and nesting migratory birds, wintering big game, sage-grouse habitats, and yearlong bighorn sheep areas.

Alternative F (Preferred Alternative)

Seismic – Vehicle activity would be restricted to designated roads. Exceptions would be authorized on a case-by-case basis, dependent upon the degree of data needed to identify the resource and the operator's ability to mitigate surface disturbance. Surface blasting would be allowed on a case-by-case basis, provided the blasts would not interfere with managing the objects for which the Monument was designated. Sensitive areas would require helicopter support. This would protect wildlife species and habitat sensitive to blasting and vibration from seismic exploration.

Drilling Operations – The BLM would recommend that no more than four well sites be allowed per section. Wildlife would be impacted if additional well pads and roads were permitted. This would cause additional disturbances from traffic, and fragmentation and reduced acreage of wildlife habitat. It is reasonably foreseeable 34 natural gas wells could be drilled on the existing leases in the Monument.

By restricting travel to the minimal vehicle required and possible time restrictions, the impacts to wildlife on the existing natural gas resource roads would be reduced. Impacts to wildlife would still occur, including habitat fragmentation, additional disturbances from traffic and reduced wildlife habitat on new resource roads (11.1 miles).

Production Facilities and Equipment – Pipelines would only be permitted within existing disturbances or the location that is least intrusive. It is reasonably foreseeable 3.9 miles of pipelines would be associated with new natural gas wells. This would reduce potential impacts to wildlife habitat, as the surface disturbance would be minimal, would avoid important riparian areas, and the duration of construction would be short-term.

Pits may be constructed to a size dependent on water production, but a maximum of two trips per month would be authorized if excess water is hauled off site. By limiting the number of vehicle trips, wildlife species sensitive to

vehicular intrusion year round, such as elk, bighorn sheep and mule deer, or during sensitive times of the year (parturition, winter range use) could be protected from additional vehicular travel. Fencing and netting would prevent bird use of produced water. As pits have to be fenced to protect wildlife, this barrier would have some effect on wildlife movement and use of the area.

Best Management Practices would be utilized to ensure the noise levels would be within acceptable limits to wildlife. This would protect species that may be sensitive to noise, such as breeding sage-grouse, breeding and nesting migratory birds, wintering big game, sage-grouse habitats, and yearlong bighorn sheep areas.

Impacts to Fish and Wildlife from Access and Transportation

Access

Alternative A (Current Management)

New resource roads would be open to the general public. There would be the potential for an additional 10.1 miles of access roads to support natural gas operations and surface disturbance on 22 acres. This would degrade wildlife habitat by permitting unlimited access on new roads and surface disturbances, as well as promoting soil erosion and habitat degradation from the introduction of noxious weeds. Wildlife would experience direct impacts such as disruption, fragmentation, crushing (collisions), and habitat loss.

Alternative B

The impacts would be the same as Alternative C, except there would be an estimated 17.4 miles of new resource roads associated with natural gas operations.

Alternative C

Public travel would be prohibited in specific areas. There would be the potential for an additional 7.4 miles of access roads to support natural gas operations. This alternative would allow travel on some of the new roads, but may close areas with wildlife concerns. This would protect wildlife and wildlife habitat, especially species that are sensitive to increased human contact.

Alternative D

The impacts would be similar to Alternative C, except there would be an estimated 0.4 miles of new resource roads associated with natural gas operations.

Alternative E

Public travel would be prohibited on all new resource roads used for natural gas operations. By prohibiting public vehicular travel on new roads, wildlife and wildlife habitat may be protected, especially species that are sensitive to increased human contact.

Alternative F (Preferred Alternative)

The impacts would be similar to Alternative C, except there would be an estimated 11.1 miles of new resource roads associated with natural gas operations.

BLM Road System

Alternative A (Current Management)

Public travel would be permitted on all roads within the Monument, although some roads would have seasonal wildlife closures. Since there would be no travel restrictions, there may be impacts to wildlife such as bighorn sheep and elk from increased vehicular use.

All existing BLM roads would be open unless currently restricted. Roads would create direct and indirect impacts to wildlife. Direct impacts would include collision mortalities, habitat loss, soil loss through runoff, and greater public access, which may lead to increased poaching, human-caused fires and increased hunting pressure. Indirect impacts would include disturbance and displacement of wildlife, habitat fragmentation, and opportunities for increased noxious weed spread and habitat degradation.

Road System Criteria

The miles of roads which would be open yearlong and seasonally are displayed in Table 4.5 for some wildlife habitat along with the acres of habitat within 1/4 mile of open roads.

Greater Sage-Grouse – There would be no public travel restrictions. Greater sage-grouse breeding success may be affected by traffic within 1/4 mile of an active lek during the breeding season. Sage-grouse nesting success may be reduced by traffic within 2 miles of a lek in nesting habitat. Sage-grouse winter survival could be compromised by traffic during stressful winter conditions on sage-grouse winter range.

Black-Tailed Prairie Dogs – There would be no public travel restrictions. Prairie dog towns accessible to vehicles would be subject to greater loss from recreational shooting.

Designated Sensitive Species – There would be no public travel restrictions. Raptors and other bird species not acclimated to vehicular disturbances could abandon nests.

Table 4.5
BLM Road Analysis for Wildlife Habitat
Alternative A (Current Management)

Wildlife Habitat	*Roads Open*	
	Yearlong	*Yearlong and Seasonally*
Elk Distribution		
Miles	320	392
Density (mile/mile^2)*	0.91	1.11
Acres within 1/4 mile	89,914	106,121
Deer and Elk Winter Range		
Miles	302	351
Density (mile/mile^2)	0.83	0.97
Acres within 1/4 mile	87,180	98,935
Antelope Crucial Winter Range		
Miles	52	52
Density (mile/mile^2)	1.25	1.25
Acres within 1/4 mile	13,529	13,653
Bighorn Sheep Distribution		
Miles	119	151
Density (mile/mile^2)	1.57	0.72
Acres within 1/4 mile	35,326	42,161
Bighorn Sheep Lambing Areas		
Miles	34	44
Density (mile/mile^2)	0.44	0.57
Acres within 1/4 mile	10,600	12,446
Sage-Grouse Crucial Winter Habitat		
Miles	18	18
Density (mile/mile^2)	1.68	1.68
Acres within 1/4 mile	3,999	4,018
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile^2)	0.29	0.29
Acres within 1/4 mile	107	107

*Miles of road per square mile of habitat on BLM land

Other wildlife would experience direct impacts such as disruption, fragmentation, crushing (collisions), and habitat loss, reducing the productivity of species already in decline.

Bald Eagle – There would be no public travel restrictions. Disturbances within 1/2 mile of bald eagle nests may cause nest abandonment.

Big Game Winter Range – There would be no travel restrictions. This would allow additional disturbance of wintering big game during a period of physical stress. Winter survival could be compromised by traffic during stressful winter conditions.

Bighorn Sheep Distribution – There would be no travel restrictions. This would allow additional disturbance of wintering bighorn sheep during a period of physical stress. Bighorn sheep distribution could be impacted by vehicle traffic and loss of habitat security.

Bighorn Sheep Lambing Areas – There would be no public travel restrictions. Bighorn lambing success could be compromised by traffic during the lambing period.

Exceptions – Administrative access would be permitted for off-road and closed-road travel. This could degrade wildlife habitat by surface disturbances, as well as promoting soil erosion and habitat degradation from the introduction of noxious weeds. Wildlife would experience direct impacts such as disruption, fragmentation, crushing (collisions), and habitat loss.

Motorized off-road travel for game retrieval would be prohibited. This would provide additional wildlife security during the big game hunting season.

Alternative B

Public travel would be allowed on all roads to state and private lands unless closed to meet Monument objectives. Some roads could have seasonal or permanent closures to protect objects for which the Monument was designated. This would cause fewer impacts to wildlife.

Roads would be evaluated based on erosion, impacts to wildlife habitat and security, and necessity for the road. Roads that affect wildlife security and habitat or soil stability could be closed seasonally or permanently. Additional roads may also be closed if they are redundant or do not satisfy access requirements. This would protect wildlife, especially species that are sensitive to human encroachment, and wildlife habitat.

Road System Criteria

The miles of roads which would be open yearlong and seasonally are displayed in Table 4.6 and discussed below for some wildlife habitat along with the acres of habitat within 1/4 mile of open roads.

G*reater Sage-Grouse* – There could be seasonal closures (March 1 to June 15) on resource roads within 1/4 mile of leks. Disturbance near leks may disrupt breeding and cause birds to abandon traditional breeding sites, or reduce breeding success for that year. Sage-grouse winter survival could

Table 4.6
BLM Road Analysis for Wildlife Habitat
Alternative B

Wildlife Habitat	*Roads Open*	
	Yearlong	*Yearlong and Seasonally*
Elk Distribution		
Miles	296	364
Density (mile/mile^2)*	0.84	1.03
Acres within 1/4 mile	84,705	100,482
Deer and Elk Winter Range		
Miles	260	319
Density (mile/mile^2	0.72	0.88
Acres within 1/4 mile	76,051	91,286
Antelope Crucial Winter Range		
Miles	52	52
Density (mile/mile^2)	1.25	1.25
Acres within 1/4 mile	13,628	13,628
Bighorn Sheep Distribution		
Miles	79	141
Density (mile/mile^2)	0.38	0.67
Acres within 1/4 mile	24,888	39,981
Bighorn Sheep Lambing Areas		
Miles	5	42
Density (mile/mile^2)	0.07	0.55
Acres within 1/4 mile	2,997	12,238
Sage-Grouse Crucial Winter Habitat		
Miles	18	18
Density (mile/mile^2)	1.68	1.68
Acres within 1/4 mile	4,000	4,018
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile^2)	0.23	0.23
Acres within 1/4 mile	72	72

*Miles of road per square mile of habitat on BLM land

be compromised by traffic during stressful winter conditions on sage-grouse winter range.

Black-Tailed Prairie Dogs – There would be no public travel restrictions. Prairie dog towns accessible to vehicles would be subject to greater loss from recreational shooting.

Designated Sensitive Species – There could be seasonal closures on resource roads within 1/4 mile of sensitive raptor species nests. The seasonal closures would be based on the species of raptor. This would protect sensitive status raptors during nesting periods.

Bald Eagle – There could be seasonal closures (February 1 to May 31) on resource roads within 1/2 mile of bald eagle nests. Disturbances within 1/2 mile of bald eagle nests may cause nest abandonment.

Big Game Winter Range – There would be no travel restrictions. This would allow additional disturbance of wintering big game during a period of physical stress. Winter survival and health of big game could be compromised by traffic during stressful winter conditions, reducing overall productivity.

Bighorn sheep Distribution – There would be no travel restrictions. Bighorn sheep distribution could be impacted by vehicle traffic and loss of habitat security during periods of stress.

Bighorn Sheep Lambing Areas – There would be seasonal closures (April 1 to June 15) on resource roads within identified lambing habitat. This would reduce stress to ewes during parturition and protect lambs when they are most susceptible. This restriction could improve lamb survival and maintain or improve populations within the available habitat.

Exceptions – Administrative access would be permitted for off-road and closed-road travel. This could degrade wildlife habitat by creating surface disturbances, as well as promoting soil erosion and habitat degradation from the introduction of noxious weeds. Wildlife would experience direct impacts such as disruption, fragmentation, crushing (collisions), and habitat loss.

Motorized game retrieval would be allowed on some identified closed roads. Access on some closed roads for game retrieval would help Montana Fish, Wildlife & Parks meet big game harvest objectives for hunting districts within the Monument. This would disturb wildlife security in areas where closed roads are used for big game retrieval and indirectly impact wildlife habitat by potentially causing soil erosion and habitat degradation from the introduction of noxious weeds.

Alternative C

Public travel would be allowed on all roads to state and private lands unless closed to meet Monument objectives. Some roads could have seasonal or permanent closures to protect objects for which the Monument was designated. This would cause fewer impacts to wildlife.

Roads would be evaluated based on erosion, impacts to wildlife habitat and security, and necessity for the road,

although roads used for access to gas well sites and major range improvement projects would also allow public vehicular travel. This would protect wildlife security and habitat, especially species that are sensitive to human encroachment, but there would continue to be impacts to wildlife and habitat associated with roads that were constructed for administrative requirements.

Road System Criteria

The miles of roads which would be open yearlong and seasonally is displayed in Table 4.7 for some wildlife habitat along with the acres of habitat within 1/4 mile of open roads.

Greater Sage-Grouse – There would be seasonal closures (March 1 to June 15) on resource roads within 1/4 mile of leks and seasonal closures (December 1 to March 31) on resource roads within sage-grouse crucial winter habitat. This would protect greater sage-grouse during sensitive breeding periods and during sensitive winter periods when sage-grouse are susceptible to human encroachment and would prevent additional disturbance of wintering sage-grouse during periods of physical stress.

Black-Tailed Prairie Dogs – Prairie dog towns accessible to vehicles would be subject to greater loss from recreational shooting.

Designated Sensitive Species – The impacts would be the same as Alternative B.

Bald Eagle – The impacts would be the same as Alternative B.

Big Game Winter Range – There would be seasonal closures (December 1 to March 31) on resource roads within identified big game winter ranges. Limiting disturbances on identified winter ranges would prevent additional disturbance of wintering big game during a period of physical stress. Big game species could experience improved survival due to reduced stress.

Bighorn sheep Distribution – Bighorn sheep distribution could be impacted by vehicle traffic and loss of habitat security. For some resource roads located within crucial big game winter range, a seasonal closure would be implemented from December 1 to March 31, on a case-by-case basis. Limiting disturbances on identified winter ranges would prevent additional disturbance of wintering big game during a period of physical stress. Bighorn sheep could experience improved survival due to reduced stress.

Bighorn Sheep Lambing Areas – The impacts would be the same as Alternative B.

Table 4.7
BLM Road Analysis for Wildlife Habitat
Alternative C

Wildlife Habitat	*Roads Open*	
	Yearlong	*Yearlong and Seasonally*
Elk Distribution		
Miles	267	334
Density (mile/mile^2)*	0.76	0.95
Acres within 1/4 mile	76,599	93,968
Deer and Elk Winter Range		
Miles	234	294
Density (mile/mile^2)	0.65	0.81
Acres within 1/4 mile	68,179	85,316
Antelope Crucial Winter Range		
Miles	49	49
Density (mile/mile^2)	1.17	1.17
Acres within 1/4 mile	12,836	12,883
Bighorn Sheep Distribution		
Miles	68	122
Density (mile/mile^2)	0.32	0.58
Acres within 1/4 mile	20,929	35,722
Bighorn Sheep Lambing Areas		
Miles	3	30
Density (mile/mile^2)	0.04	0.39
Acres within 1/4 mile	1,936	9,543
Sage-Grouse Crucial Winter Habitat		
Miles	18	18
Density (mile/mile^2)	1.68	1.68
Acres within 1/4 mile	3,883	3,933
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile^2)	0.23	0.23
Acres within 1/4 mile	72	72

*Miles of road per square mile of habitat on BLM land

Exceptions – Administrative access would be permitted for off-road and closed-road travel. This could degrade wildlife habitat by creating surface disturbances, as well as promoting soil erosion and habitat degradation from the introduction of noxious weeds. Wildlife would experience direct impacts such as disruption, fragmentation, crushing (collisions), and habitat loss.

Motorized game retrieval would be allowed on some identified closed roads. Access on some closed roads for game retrieval would help Montana Fish, Wildlife & Parks meet big game harvest objectives for hunting districts within the Monument. This would disturb wildlife security in areas where closed roads are used for big game retrieval and indirectly impact wildlife habitat by potentially causing soil erosion and habitat degradation from the introduction of noxious weeds. Potential disturbances may be reduced by establishing a time window for the retrieval opportunities.

Alternative D

Public travel would be allowed on all roads to state and private lands unless closed to meet Monument objectives. Some roads could have seasonal or permanent closures to protect objects of the Monument. This would cause fewer impacts to wildlife.

The BLM would retain only necessary roads and would eliminate parallel roads, spur roads, and roads adjacent to rims. This would protect wildlife and wildlife habitat, especially species that are sensitive to human encroachment, by closing nearly 44% of the existing roads.

Road System Criteria

The miles of roads which would be open yearlong and seasonally are displayed in Table 4.8 for some wildlife habitat along with the acres of habitat within 1/4 mile of open roads.

Greater Sage-Grouse – There would be seasonal closures (March 1 to June 15) on resource roads within 2 miles of leks and seasonal closures (December 1 to March 31) on resource roads within sage-grouse crucial winter habitat. This would protect greater sage-grouse during sensitive breeding and nesting periods and during sensitive winter periods when sage-grouse are susceptible to human encroachment, and would prevent additional disturbance of wintering sage-grouse during periods of physical stress.

Black-Tailed Prairie Dogs – Prairie dog towns accessible to vehicles would be subject to greater loss from recreational shooting.

Designated Sensitive Species – There could be seasonal closures on resource roads and local roads that are within 1/4 mile of sensitive raptor species nests. The seasonal closures would be based on the species of raptor. This would protect sensitive status raptors during sensitive nesting periods.

Bald Eagle – The impacts would be the same as Alternative B.

Table 4.8
BLM Road Analysis for Wildlife Habitat
Alternative D

Wildlife Habitat	*Roads Open*	
	Yearlong	*Yearlong and Seasonally*
Elk Distribution		
Miles	186	215
Density (mile/mile^2)*	0.53	0.61
Acres within 1/4 mile	57,229	65,205
Deer and Elk Winter Range		
Miles	161	190
Density (mile/mile^2)	0.44	0.52
Acres within 1/4 mile	51,829	60,205
Antelope Crucial Winter Range		
Miles	29	35
Density (mile/mile^2)	0.70	0.84
Acres within 1/4 mile	8,234	9,779
Bighorn Sheep Distribution		
Miles	59	84
Density (mile/mile^2)	0.28	0.40
Acres within 1/4 mile	18,540	25,567
Bighorn Sheep Lambing Areas		
Miles	7	22
Density (mile/mile^2)	0.09	0.29
Acres within 1/4 mile	2,624	6,641
Sage-Grouse Crucial Winter Habitat		
Miles	7	9
Density (mile/mile^2)	0.65	0.84
Acres within 1/4 mile	2,090	2,856
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile^2)	0.23	0.23
Acres within 1/4 mile	72	72

*Miles of road per square mile of habitat on BLM land

Big Game Winter Range (elk, mule deer, pronghorn) – The impacts would be the same as Alternative C.

Bighorn sheep Distribution – The impacts would be the same as Alternative C.

Bighorn Sheep Lambing Areas – There would be seasonal closures (April 1 to June 15) on resource roads and local

roads within identified lambing habitat. This would reduce stress to ewes during parturition and protect lambs when they are most susceptible. This restriction could improve lamb survival and maintain or improve populations within the available habitat.

Exceptions – Administrative, government agency off-road and closed-road travel would be allowed, although permittees and lessees administering lease rights may have seasonal restrictions for off-road and closed-road travel. This could degrade wildlife habitat by creating surface disturbances, as well as promoting soil erosion and habitat degradation from the introduction of noxious weeds. Since off-road travel would continue for government agencies, wildlife would experience direct impacts such as disruption, fragmentation, crushing (collisions), and habitat loss. Permittee and leasee off-road and closed-road travel could be mitigated to protect wildlife and wildlife habitat.

Motorized game retrieval would be allowed on some identified closed roads. Access on some closed roads for game retrieval would help Montana Fish, Wildlife & Parks meet big game harvest objectives for hunting districts within the Monument. This would disturb wildlife security in areas where closed roads are used for big game retrieval and indirectly impact wildlife habitat by potentially causing soil erosion and habitat degradation from the introduction of noxious weeds. Potential disturbances may be reduced by establishing a time window for the retrieval opportunities.

Alternative E

Public travel would be allowed on all roads to state and private lands unless closed to meet Monument objectives. Some roads could have seasonal or permanent closures to protect objects of the Monument. This would cause fewer impacts to wildlife.

The BLM would retain collector and local roads, but most resource roads would be closed. This would protect wildlife and wildlife habitat, especially species that are sensitive to human encroachment by closing nearly 82% of existing roads.

Road System Criteria

The miles of roads which would be open yearlong and seasonally are displayed in Table 4.9 for some wildlife habitat along with the acres of habitat within 1/4 mile of open roads.

Greater Sage-Grouse – There would be yearlong resource road closures within 1/4 mile of leks and a seasonal closure (December 1 to March 31) on resource roads within sage-grouse crucial winter habitat. This would protect greater sage-grouse during sensitive breeding periods and sensitive winter periods when sage-grouse are susceptible to human encroachment. This would prevent additional disturbance of wintering sage-grouse during periods of physical stress.

Black-Tailed Prairie Dogs – Prairie dog towns accessible to vehicles would be subject to greater loss from recreational shooting.

Designated Sensitive Species – There could be seasonal closures on resource, local, and collector roads within 1/4

Table 4.9
BLM Road Analysis for Wildlife Habitat
Alternative E

Wildlife Habitat	*Roads Open*	
	Yearlong	*Yearlong and Seasonally*
Elk Distribution		
Miles	48	52
Density (mile/mile^2)*	0.14	0.15
Acres within 1/4 mile	14,773	16,140
Deer and Elk Winter Range		
Miles	32	32
Density (mile/mile^2)	0.09	0.09
Acres within 1/4 mile	11,002	11,218
Antelope Crucial Winter Range		
Miles	6	6
Density (mile/mile^2)	0.14	0.14
Acres within 1/4 mile	1,771	1,914
Bighorn Sheep Distribution		
Miles	29	33
Density (mile/mile^2)	0.14	0.16
Acres within 1/4 mile	8,919	9,980
Bighorn Sheep Lambing Areas		
Miles	5	7
Density (mile/mile^2)	0.07	0.09
Acres within 1/4 mile	1,550	2,051
Sage-Grouse Crucial Winter Habitat		
Miles	3	3
Density (mile/mile^2)	0.28	0.28
Acres within 1/4 mile	939	972
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile^2)	0.23	0.23
Acres within 1/4 mile	72	72

*Miles of road per square mile of habitat on BLM land

mile of sensitive raptor species nests based on the species of raptor. This would protect sensitive status raptors during sensitive nesting periods, primarily raptors in new high use roads.

Bald Eagle – The impacts would be the same as Alternative B.

Big Game Winter Range – The impacts would be the same as Alternative D.

Bighorn sheep Distribution – The impacts would be the same as Alternative C.

Bighorn Sheep Lambing Areas – The impacts would be the same as Alternative D.

Exceptions – Closed roads would be open for government agencies and permittees and lessees administering lease rights. Off-road travel would be prohibited for government agencies, but allowed for lessees and permittees on a case-by-case basis. Since less off-road travel would occur, there would be fewer impacts to wildlife and wildlife habitat.

Motorized off-road travel for game retrieval would be prohibited. This would provide additional wildlife security during the big game hunting season.

Alternative F (Preferred Alternative)

Public travel would be allowed on all roads to state and private lands unless closed to meet Monument objectives. Some roads could have seasonal or permanent closures to protect objects of the Monument (e.g., diverse wildlife habitat). This would cause fewer impacts to wildlife.

Roads would be evaluated based on erosion, impacts to wildlife habitat and security, and necessity for the road. This would protect wildlife, wildlife security, and wildlife habitat, especially for those species that are sensitive to human encroachment, but there would continue to be impacts to wildlife and habitat associated with roads that were constructed for administrative requirements.

Road System Criteria

The miles of roads which would be open yearlong and seasonally are displayed in Table 4.10 for some wildlife habitat along with the acres of habitat within 1/4 mile of open roads.

Greater Sage-Grouse – Seasonal closures (March 1 to June 15) on resource roads within 1/4 mile of leks and seasonal closures (December 1 to March 31) on resource roads within sage-grouse crucial winter habitat would prevent disturbance of breeding birds, some nesting areas, and wintering sage-grouse during a periods of physical stress.

Table 4.10
BLM Road Analysis for Wildlife Habitat
Alternative F (Preferred Alternative)

Wildlife Habitat	*Roads Open*	
	Yearlong	*Yearlong and Seasonally*
Elk Distribution		
Miles	125	249
Density (mile/mile^2)*	0.35	0.70
Acres within 1/4 mile	38,561	75,102
Deer and Elk Winter Range		
Miles	95	220
Density (mile/mile^2)	0.26	0.61
Acres within 1/4 mile	31,051	68,900
Antelope Crucial Winter Range		
Miles	15	38
Density (mile/mile^2)	0.36	0.91
Acres within 1/4 mile	4,473	10,799
Bighorn Sheep Distribution		
Miles	42	105
Density (mile/mile^2)	0.20	0.50
Acres within 1/4 mile	13,254	31,798
Bighorn Sheep Lambing Areas		
Miles	7	27
Density (mile/mile^2)	0.09	0.35
Acres within 1/4 mile	2,566	8,468
Sage-Grouse Crucial Winter Habitat		
Miles	8	11
Density (mile/mile^2)	0.75	1.03
Acres within 1/4 mile	2,286	3,047
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile^2)	0.23	0.23
Acres within 1/4 mile	72	72

*Miles of road per square mile of habitat on BLM land

Black-Tailed Prairie Dogs – Prairie dog towns accessible to vehicles would be subject to greater loss from recreational shooting.

Designated Sensitive Species – Seasonal closures on resource roads within 1/4 mile of sensitive raptor species nests would protect sensitive status raptors during nesting periods and would be based on the species of raptor.

Bald Eagle – Seasonal closures (February 1 to May 31) on resource roads within 1/2 mile of bald eagle nests would protect eagles during sensitive nesting periods. Disturbances within 1/2 mile of bald eagle nests may cause nest abandonment.

Big Game Winter Range – Seasonal closures (December 1 to March 31) on resource roads within identified big game winter ranges could improve big game survival by reducing human contact and reducing stress during the winter period. Limiting disturbances on identified winter ranges would prevent additional disturbance of wintering big game during a period of physical stress. Big game species could experience improved survival due to reduced stress.

Bighorn sheep Distribution – Bighorn sheep distribution could be impacted by vehicle traffic and loss of habitat security. For some resource roads that are located within crucial big game winter range, a seasonal closure would be implemented from December 1 to March 31, on a case-by-case basis. Limiting disturbances on identified winter ranges would prevent additional disturbance of wintering big game during a period of physical stress. Bighorn sheep could experience improved survival due to reduced stress.

Bighorn Sheep Lambing Areas – Seasonal closures (April 1 to June 15) on resource roads within identified lambing habitat would protect bighorn lambs during sensitive lambing periods.

Exceptions – Administrative access would be allowed for off-road and closed-road travel. This could degrade wildlife habitat by creating surface disturbances, as well as promoting soil erosion and habitat degradation. Wildlife would experience direct impacts such as disruption, fragmentation, crushing (collisions), and habitat loss.

Motorized game retrieval would be allowed on some identified closed roads between the hours of 10 a.m. and 2 p.m. Access on some closed roads for game retrieval would help Montana Fish, Wildlife & Parks meet big game harvest objectives for hunting districts. This would disturb wildlife security in areas where closed roads are used for big game retrieval and indirectly impact wildlife habitat by potentially causing soil erosion and habitat degradation from the introduction of noxious weeds.

Aviation

Alternative A (Current Management)

The 10 existing airstrips would remain open. The surface disturbance would be minimal, although there would be an opportunity for aircraft landing to disturb bighorn sheep and lambs on the Ervin Ridge airstrip. The airstrips are displayed in Table 4.11 for some wildlife habitat.

Alternative B

Ten airstrips would be open yearlong and additional airstrips could be authorized after environmental review. The surface disturbance would be minimal, although there would be an opportunity for aircraft landings to disturb bighorn sheep and lambs on the Ervin Ridge airstrip. The airstrips are displayed in Table 4.11 for some wildlife habitat.

Alternative C

Four airstrips would be open yearlong and three would be restricted seasonally to protect wildlife in sensitive habitat or during sensitive times of the year such as during breeding or parturition, or while utilizing winter range. This would allow the same guidelines protecting wildlife from roads to

Table 4.11
Backcountry Airstrips within Wildlife Habitat
Alternatives A (Current Management) and B

Airstrip	*Elk and Deer Winter Range*	*Bighorn Sheep Distribution*	*Bighorn Sheep Lambing*	*Sage-Grouse Crucial Winter Habitat*
Black Butte North	Yes			
Black Butte South	Yes			
Bullwhacker	Yes	Yes		
Cow Creek				Yes
Ervin Ridge	Yes	Yes	Yes	
Knox Ridge	Yes			
Left Coulee	Yes	Yes		
Log Cabin	Yes	Yes		
Roadside	Yes	Yes		
Woodhawk		Yes		

Table 4.12 Backcountry Airstrips within Wildlife Habitat Alternative C				
Airstrip	*Elk and Deer Winter Range*	*Bighorn Sheep Distribution*	*Bighorn Sheep Lambing*	*Sage-Grouse Crucial Winter Habitat*
Black Butte North	Yes			
Bullwhacker	Yes	Yes		
Cow Creek				Yes
Ervin Ridge	Yes	Yes	Yes	
Knox Ridge	Yes			
Left Coulee	Yes	Yes		
Woodhawk		Yes		

also protect wildlife from the use of landing strips. The airstrips are displayed in Table 4.12 for some wildlife habitat.

Alternative D

Six airstrips would be open and clusters would be avoided. Four of the airstrips would have seasonal restrictions to protect wildlife. This would allow the same guidelines protecting wildlife from roads to also protect wildlife from the use of landing strips. The airstrips are displayed in Table 4.13 for some wildlife habitat.

Alternative E

Airstrips would be prohibited in the Monument. Closure of all airstrips in the Monument may protect wildlife from aircraft landings, although low-flying aircraft could impact wildlife during sensitive times of the year such as during breeding or parturition, or while utilizing winter range.

Alternative F (Preferred Alternative)

Six airstrips would be open and clusters would be avoided. Four of the airstrips would have seasonal restrictions to protect wildlife. This would allow the same guidelines protecting wildlife from roads to also protect wildlife from the use of landing strips. The airstrips are displayed in Table 4.13 for some wildlife habitat.

Summary of Cumulative Impacts to Fish and Wildlife

Alternative A (Current Management)

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. About 99,000 acres of deer and elk winter range and 4,000 acres of crucial sage-grouse winter habitat are within 1/4 mile of an open BLM road.

Table 4.13 Backcountry Airstrips within Wildlife Habitat Alternatives D and F (Preferred Alternative)				
Airstrip	*Elk and Deer Winter Range*	*Bighorn Sheep Distribution*	*Bighorn Sheep Lambing*	*Sage-Grouse Crucial Winter Habitat*
Black Butte North	Yes			
Bullwhacker	Yes	Yes		
Cow Creek				Yes
Ervin Ridge	Yes	Yes	Yes	
Knox Ridge	Yes			
Left Coulee	Yes	Yes		

Big game and sage-grouse would continue to be impacted by existing and potential natural gas development and infrastructure in crucial habitat. About 6,900 acres of deer and elk winter range and 440 acres of crucial sage-grouse winter habitat would have a seasonal restriction from December 1 to May 15. Cross-country seismic activity would temporarily displace wildlife and disturb wildlife habitat.

Prairie dogs would be vulnerable to control or management based on the needs of vegetative and other resources. This could impact associated species including some designated sensitive species.

Current management may allow fences which would create greater impacts to wildlife passage. Current management on the use of campfires would increase the risk of fire destroying important vegetation and wildlife habitat.

Alternative B

Management under this alternative would improve habitat for sage-grouse, prairie dogs, many designated sensitive species, and in some important big game habitats.

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. About 91,000 acres of deer and elk winter range and 4,000 acres of crucial sage-grouse winter habitat are within 1/4 mile of an open BLM road.

Big game and sage-grouse would be impacted by existing and potential natural gas development and infrastructure in crucial habitat. About 26,000 acres of deer and elk winter range and 440 acres of crucial sage-grouse winter habitat would have a seasonal restriction from December 1 to March 31. Cross-country seismic activity would temporarily displace wildlife and disturb wildlife habitat.

Proposed management may alter or reduce fences which act as wildlife barriers. Proposed campfire restrictions would reduce the risk of fire in important vegetation and wildlife habitat. Additional developed campgrounds would disturb additional wildlife and alter additional wildlife habitat important to many species.

Alternative C

Management under this alternative would improve habitat for sage-grouse, prairie dogs, many designated sensitive species, and in some important big game habitats.

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. About 85,000 acres of deer and elk winter range and 3,900 acres of crucial sage-grouse winter habitat are within 1/4 mile of an open BLM road.

Big game and sage-grouse would be impacted by existing and potential natural gas development and infrastructure in crucial habitat. About 26,000 acres of deer and elk winter range and 440 acres of crucial sage-grouse winter habitat would have a seasonal restriction from December 1 to March 31. Seismic exploration would only be permitted on designated roads, which would protect wildlife species and habitat sensitive to human disturbance.

Proposed management may alter or reduce fences which act as wildlife barriers. Proposed campfire restrictions would reduce the risk of fire in important vegetation and wildlife habitat. Additional developed campgrounds would disturb additional wildlife and alter additional wildlife habitat important to many species. Limiting the use of motorized craft and floatplanes would reduce potential impacts to many wildlife species along the Missouri River.

Alternative D

Management under this alternative would improve habitat for sage-grouse, prairie dogs, many designated sensitive species, and in some important big game habitats.

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. About 60,000 acres of deer and elk winter range and 2,900 acres of crucial sage-grouse winter habitat are within 1/4 mile of an open BLM road.

Big game and sage-grouse would be impacted by existing and potential natural gas development and infrastructure in crucial habitat. About 26,000 acres of deer and elk winter range and 440 acres of crucial sage-grouse winter habitat would have a seasonal restriction from December 1 to May 15. Although wildlife and wildlife habitat would not be affected by cross-country seismic activity, helicopter-supported activities could impact wildlife during sensitive time periods.

Proposed management may alter or reduce fences which act as wildlife barriers. Proposed campfire restrictions would reduce the risk of fire in important vegetation and wildlife habitat. Additional developed campgrounds would disturb additional wildlife and alter additional wildlife habitat important to many species. Limiting the use of motorized craft and floatplanes would reduce potential impacts to many wildlife species along the Missouri River.

Alternative E

Management under this alternative would improve habitat for sage-grouse, prairie dogs, many designated sensitive species, and in some important big game habitats.

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. About 11,000 acres of deer and elk winter range and 1,000 acres of crucial sage-grouse winter habitat are within 1/4 mile of an open BLM road.

Big game and sage-grouse would continue to be impacted by existing natural gas development and infrastructure in crucial habitat but no additional impacts. If seismic activity did occur, wildlife and wildlife habitat would not be affected by cross-country seismic activity; helicopter-supported activities could impact wildlife during sensitive time periods.

Proposed management may alter or reduce fences which act as wildlife barriers. Proposed campfire restrictions would reduce the risk of fire in important vegetation and wildlife habitat. Limiting the use of motorized craft and floatplanes would reduce potential impacts to many wildlife species along the Missouri River.

Alternative F (Preferred Alternative)

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. About 69,000 acres of deer and elk winter range and 3,000 acres of crucial sage-grouse winter habitat are within 1/4 mile of an open BLM road.

Big game and sage-grouse would be impacted by existing and potential natural gas development and infrastructure in crucial habitat. About 26,000 acres of deer and elk winter range and 440 acres of crucial sage-grouse winter habitat would have a seasonal restriction from December 1 to March 31. Seismic vehicle activities would only be permitted on designated roads and/or with helicopter support, which would protect wildlife species and habitat sensitive to human disturbance.

Proposed management may alter or reduce fences which act as wildlife barriers. Proposed campfire restrictions would reduce the risk of fire in important vegetation and wildlife habitat. Additional developed campgrounds would disturb wildlife and alter additional wildlife habitat important to many species. Limiting the use of motorized craft and floatplanes would reduce potential impacts to many wildlife species along the Missouri River.

Geology and Paleontology

Impacts to Geology and Paleontology from Health of the Land and Fire

Wild and Scenic Rivers

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

There would be no impact, as there would be no changes to the management of BLM land that would affect geology and paleontology.

Impacts to Geology and Paleontology from Visitor Use, Services and Infrastructure

Alternatives A (Current Management), B, C, and D

The BLM would allow the development of plans to enhance geologic and paleontological resources for public information and education.

Alternative E

There would be no possibility of future activities that would increase the information about geologic or paleontologic resources.

Alternative F (Preferred Alternative)

The BLM would allow the development of plans to enhance geologic and paleontologic resources for public information and education.

Impacts to Geology and Paleontology from Natural Gas Exploration and Development

Alternative A (Current Management)

More information would become available from the correlation of well logs by allowing drilling in a wider area.

Alternatives B, C, and D

Drilling would be restricted to fewer locations on BLM land, reducing the potential to gather additional information about subsurface geology in the Monument.

Alternative E

The permitting of new wells on BLM land would be restricted. This would reduce the potential to gather addi-

tional information about subsurface geology in the Monument.

Alternative F (Preferred Alternative)

Drilling would be restricted to fewer locations on BLM land, reducing the potential to gather additional information about subsurface geology in the Monument.

Impacts to Geology and Paleontology from Access and Transportation

Alternative A (Current Management)

There would be adequate roads to access the Monument for enhanced interpretation opportunities and fossil recovery.

Alternatives B, C, and D

There would be fewer opportunities to access the Monument.

Alternative E

Most existing resource roads and trails would be closed and the opportunity for access to interpretive sites and recovery of the paleontological resources would be eliminated.

Alternative F (Preferred Alternative)

There would be a minor impact on geologic and paleontologic resources by reducing access to the Monument.

Summary of Cumulative Impacts to Geology and Paleontology

Alternatives A (Current Management), B, C, and D

The flexibility to gather more information about geologic and paleontologic resources in the Monument would prevent the loss of this information due to erosion.

Alternative E

The opportunity to develop information about geologic and paleontologic resources would be eliminated.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives A, B, C, and D.

Soils

Impacts to Soils Common to All Alternatives

Surface-disturbing activities would remove protective vegetative cover, resulting in bare soil exposure, potential compaction, mixing of soil horizons, increased susceptibility to water and wind erosion, loss of topsoil, and decreased soil productivity, and site production. These impacts could result in potential accelerated erosion, runoff and off-site sedimentation, and a subsequent increase in the loss of the resource. Accelerated soil erosion is in excess of natural erosion rates and occurs when soil particles are detached and removed as a result of human and/or animal activities. Accelerated soil erosion, and the resulting sedimentation, would be difficult to distinguish from natural erosion rates due to the relatively high natural erosion rates that occur throughout the Monument. Water erosion could result during high intensity rainfall, snowmelt or runoff events. Soils are most susceptible to wind erosion when soil aggregates are broken up, dry conditions exist, and soils are bare.

Soil compaction occurs when soil particles are pressed together, which limits pore space for air/water, alters soil structure, and reduces infiltration/permeability rates and soil strength. Severity depends on soil type, soil moisture, vegetative cover, and the frequency and weight (lbs./sq. inch) of equipment passing over the soils. Severe compaction inhibits natural revegetation by reducing root penetration, restricting water and air movement, severely limiting the rate of water infiltration/permeability, increasing surface runoff, and slowing seed emergence. Soils are the most susceptible to compaction during moist conditions.

Best Management Practices (Appendix G), standard operating procedures and design standards would be implemented at the site-specific project level to mitigate and minimize impacts to the soil resource from all surface-disturbing activities.

To reduce soil loss, activities should be avoided on badlands, steep/very steep slopes, slopes susceptible to mass failure, and other areas subject to active erosion.

Vegetation

Using exclosures and changing the season of use, grazing systems and riparian pastures would help to achieve Proper Functioning Condition (PFC), which helps stabilize the uplands and riparian areas. Maintaining PFC on upland sites promotes adequate amounts of vegetative cover to stabilize soils. Maintaining PFC in riparian areas promotes the growth of deep rooted riparian vegetation that dissipates streamflow energy, stabilizes streambanks from cutting action, and filters sediment (Appendix H).

Rangeland Health/Improvements

Implementing Standards for Rangeland Health and Guidelines for Livestock Grazing Management would slowly reduce grazing impacts to soils. Soil benefits would result from maintaining or promoting adequate amounts of vegetative ground cover, plant vigor, subsurface soil conditions that support permeability rates, soil biological organisms, nutrient cycling and riparian/wetland functions (Appendix H). These improvements would reduce soil erosion, compaction, runoff and sedimentation.

Range improvement projects such as water developments would result in short-term localized soil erosion and compaction during construction. Also, retaining water would result in saturated soil pores and aerobic conditions changing over time to anaerobic conditions. Oxygen would not be available to the soil flora and fauna and biological activity would be reduced. Vegetation composition would shift to hydrophytic species. Additionally, as a result of the anaerobic environment, soils would become reduced and undergo chemical reactions that are different than non-saturated soils.

Rights-of-Way

Rights-of-way activities could create short-term soil and vegetation disturbances. Pre-disturbance or near pre-disturbance conditions would be restored through reclamation practices. Rights-of-way would be avoided in areas considered unsuitable due to erosion and slope where impacts could not be mitigated or effectively controlled. Careful planning and design of the disturbing activity could limit potential impacts. Reclamation using the appropriate BMPs (Appendix G) and mitigation measures would be required.

Visitor Use

Increased visitor and recreational use could result in increased soil and vegetation disturbances. Disturbances would occur in areas of concentrated use, such as roads, hiking trails and campgrounds. This could result in decreased soil productivity and increased soil compaction and erosion depending upon the circumstance and duration of use.

Prime Farmland

If a surface-disturbing activity is proposed on a prime farmland site, the site would be identified as prime farmland and special attention would be required during reclamation. Based on the natural gas RFD, no prime farmland soil map units would be affected by natural gas development.

Impacts to Soils from Health of the Land and Fire

Fish and Wildlife – Greater Sage-Grouse

Alternative A (Current Management)

Maintaining sagebrush with 15-50% canopy cover in greater sage-grouse habitat would provide adequate vegetative cover to protect soil particles from wind and raindrop impact. Soils within the planning area would be susceptible to wind erosion, particularly during dry soil conditions and where vegetation is sparse.

Alternatives B, C, D, and E

Leaving adequate residual herbaceous cover in greater sage-grouse habitat would provide adequate vegetative cover to protect soil particles from wind and raindrop impact. There would be short-term (less than a year) localized soil erosion and compaction during the development of off-site water for livestock. Prescribed fire and/or mechanical treatments could create short-term (1 to 3 years) soil erosion and compaction until vegetation is re-established.

Alternative F (Preferred Alternative)

Leaving adequate residual herbaceous cover in greater sage-grouse habitat would provide adequate vegetative cover to protect soil particles from wind and raindrop impact. There would be short-term (less than a year) localized soil erosion and compaction during the development of off-site water for livestock. Prescribed fire and/or mechanical treatments could create short-term (1 to 3 years) soil erosion and compaction until vegetation is re-established. Soils within the planning area would be susceptible to wind erosion, particularly during dry soil conditions and where vegetation is sparse.

Fish and Wildlife – Black-Tailed Prairie Dog Towns

Alternative A (Current Management)

Every acre a prairie dog town expands could be rated in poor ecological condition (early seral) and could contribute to not meeting Standards for Rangeland Health. Bare soil exposure, soil erosion and vegetation loss could increase, which could reduce soil productivity and site production.

Alternatives B, C, and D

Prairie dog expansion in the Monument would be allowed; however, the soil resource would be protected in those expansion areas by following guidance from Standards for Rangeland Health (Appendix H). This would ensure that

soils remain stable and accelerated erosion, in the form of rills and/or gullies, is minimal.

Alternative E

The impacts would be the same as Alternative A.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives B, C, and D.

Forest Products

Alternative A (Current Management)

Harvesting forest products and vegetation manipulation treatments would result in localized soil compaction, rutting and bare soil exposure. This could result in increased short-term (1 to 2 years) surface runoff, sedimentation, erosion and decreased slope stability. Impacts would be addressed in site-specific NEPA analyses and silviculture plans. Best Management Practices (Appendix G) would mitigate and reduce impacts.

Alternatives B, C, and D

Harvesting forest products that are incidental and associated with other projects/activities or where forest/woodland health is in jeopardy would result in localized soil compaction, rutting and bare soil exposure. This could result in increased short-term (1 to 2 years) surface runoff, sedimentation, erosion and decreased slope stability. Impacts would be addressed in site-specific NEPA analyses and silviculture plans. Best Management Practices (Appendix G) would mitigate and reduce impacts.

Alternative E

No soil impacts would occur because commercial products sales and incidental personal use would be prohibited.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives B, C, and D.

Land Ownership Adjustment

Alternative A (Current Management)

There would be no soil impacts because no lands would be identified for disposal or acquisition; therefore, soil conditions would remain as they are.

Alternatives B, C, D, E, and F (Preferred Alternative)

Wind and water erosion could increase and soil productivity could decrease assuming the proposed disposal lands are converted from native vegetation to cultivated agricultural crops. However, if such agricultural practices were in compliance with Natural Resources Conservation Service (NRCS) conservation plans, erosion would be minimized.

Soil and vegetation disturbances could increase if the proposed acquired lands were to be used as a campground. This could result in decreased soil productivity and increased soil compaction and erosion. The severity would depend upon the circumstance and duration of use.

Neither the disposal nor the acquisition lands contain prime farmlands; therefore, there would be no unnecessary and irreversible conversion of prime or unique farmland to non-agricultural uses.

Fire

Prescribed and wildland fires cause short-term localized soil erosion, runoff and sedimentation. Factors such as intensity, duration, soil moisture, vegetation type, fuel type and density, and time of year determine the severity of the impacts to soil physical, chemical and biological properties. As vegetation recovers the impacts diminish. Recovery typically occurs within 1 to 3 years resulting in minimal effects to the long-term productivity of a site. Soil impacts are typically less severe from prescribed fire than from wildland fire. Prescribed fires reduce fuel loading, minimizing the risk of catastrophic wildland fires. Impacts from prescribed fires would be addressed in site-specific NEPA analyses and burn plans. Limiting the use of heavy equipment during aggressive suppression would benefit the soil resource within the Monument. Past use of this type of equipment has scarred the land, particularly on sparsely vegetated shallow soils that do not recover well from disturbance.

Alternative A (Current Management)

Prescribed and wildland fires would cause increased short-term (1-3 years) localized soil erosion, sedimentation and runoff. Soil impacts could occur on approximately 35,000 acres proposed for treatment with prescribed fire as directed in watershed plans within the Monument (Armells, Upper Missouri, Arrow Creek and the Monument portion of the Bears Paw to Breaks).

Soil impacts from wildland fire would be localized and dependent on the intensity of the fire.

Alternative B

The soil impacts would be similar to those in Alternative A, except soil disturbances from wildland fire could be reduced because such fires would be suppressed aggressively using all available methods including mechanical. Should earth-moving equipment be authorized for use, careful consideration would be given to how and where it is used, in order to minimize potential impacts from erosion.

Short-term (1-3 years) soil erosion, sedimentation and runoff associated with prescribed fires would only occur in the Wilderness Study Area Fire Management Unit (FMU). Within all other FMUs, prescribed fire would be excluded; therefore, there would be a greater risk of catastrophic wildland fire, which could create a greater impact to soils.

Alternative C

The potential of using prescribed fire to treat 20,000 acres (per direction from the BLM Fire/Fuels Management Plan Environmental Assessment/Plan Amendment for Montana and the Dakotas (BLM 2003e) and the various watershed plans that include Monument land) could create short-term (1-3 years) localized soil erosion, sedimentation and runoff. Under this alternative, soil impacts from prescribed fire would be less than those described in Alternatives A, D, and E.

Soil impacts from aggressive wildland fire suppression within the Wild and Scenic River FMU would be the same as in Alternative B.

Alternative D

Prescribed and wildland fires cause increased short-term (1-3 years) localized soil erosion, sedimentation and runoff, as described in the introduction to this section. Potentially returning 250,000 acres back to Condition Class 1 would also result in short-term (1 to 3 years) soil impacts. However, doing this would result in the largest number of acres treated to reduce potential hazardous fuel loading and catastrophic wildland fires.

Soil impacts from aggressive wildland fire suppression within the Wild and Scenic River FMU would be the same as those in Alternative B.

Alternative E

Soil impacts from prescribed fire would be similar to those in Alternative D, less the potential soil impacts of returning 250,000 acres back to Condition Class 1.

There would be no soil impacts from aggressive wildland fire suppression within the Wild and Scenic River FMU.

Alternative F (Preferred Alternative)

Soil impacts from prescribed fire would be similar to those in Alternative D, less the potential soil impacts of returning 250,000 acres back to Condition Class 1.

Soil impacts from aggressive wildland fire suppression within the Wild and Scenic River FMU would be the same as in Alternative B.

Wild and Scenic Rivers

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

There would be no impact, as there would be no changes to the management of BLM land that would affect soils.

Impacts to Soils from Visitor Use, Services and Infrastructure

Upper Missouri River SRMA

Alternative A (Current Management)

Opportunities for Boaters – Having no limits on the number of boaters and the duration of their stay on the Missouri River could increase soil impacts. As user numbers and user days increase, so does the potential for long-term soil and vegetation disturbances. This would result in decreased soil productivity and increased soil compaction and erosion within areas of concentrated use.

Motorized Watercraft – Wakes from motorized watercraft could impact shore stability, resulting in increased sediment in the Missouri River. However, these effects would be minimal in areas where there is deep root riparian vegetation which armors and stabilizes soils on stream/river banks.

Alternative B

Opportunities for Boaters – The impacts would be the same as Alternative A.

Camping Facilities – Providing more Level 1, 2 and 3 sites could increase the number of recreation users, resulting in increased soil and vegetation disturbances. Soil compaction and erosion could increase and soil productivity could decrease in recreational use areas. However, creating improved facilities could confine the disturbances to those developed areas, assuming recreational use is shifted to those areas. There is the potential for short-term (less than a year) localized soil compaction and erosion during the construction of Level 1 and 2 sites.

Motorized Watercraft – Wakes from motorized watercraft could impact shore stability, resulting in increased sediment in the Missouri River. However, these effects would be minimal in areas where there is deep root riparian vegetation which armors and stabilizes soils on stream/river banks.

Alternative C

Opportunities for Boaters – Soil impacts would be similar to those in Alternatives A and B regarding no limits on the number of boaters and the duration of their stay on the Missouri River. Implementing management adjustments through standard and indicators (Appendix K) would protect soils.

Camping Facilities – Providing additional Level 1 sites in the recreation segments of the river and additional Level 2 sites between Fort Benton and Judith Landing could increase the number of recreation users, resulting in increased soil and vegetation disturbances. Soil compaction, erosion and decreased soil productivity would increase in recreational use areas. However, creating improved facilities could confine these disturbances to the developed areas, assuming use is shifted to those areas. There is the potential for short-term (less than a year) localized soil compaction and erosion during the construction of Level 1 and 2 sites.

Restricting the duration of overnight camping at Level 2 sites, during core use periods on the river, could result in fewer recreational user disturbances to soils and vegetation at those sites.

Motorized Watercraft – Wakes from motorized watercraft could impact shore stability, resulting in increased sediment in the Missouri River. However, these effects would be minimal in areas where there is deep root riparian vegetation, which armors and stabilizes soils on stream/river banks.

Alternative D

Opportunities for Boaters – Soil impacts would be similar to those in Alternative C regarding no limits on the number of boaters and protection to soils from management adjustments when standard and indicators (Appendix K) are reached or exceeded. However, where a seasonal or temporary emergency allocation system is developed and implemented, boater numbers could be reduced, resulting in fewer soil disturbances. This could improve soil conditions and return soil productivity.

Camping Facilities – Restricting the duration of overnight camping at Level 2 sites, during core use periods on the river, could result in fewer recreational user disturbances to soils and vegetation at those sites.

There is the potential for short-term (less than a year) localized soil compaction and erosion during the construction of Level 2 sites in the recreation segments of the river.

Motorized Watercraft – Wakes from motorized watercraft could have an impact on shore stability resulting in increased sediment in the Missouri River. However, these effects would be minimal in areas where there is deep root riparian vegetation which armors and stabilizes soils on stream/river banks.

Alternative E

Opportunities for Boaters – This alternative would create the fewest soil disturbances as it would restrict the number of boaters, the duration of their stay and campsite development. Soil and vegetation disturbances, compaction and erosion could decrease.

Motorized Watercraft – There would be no soil impacts from wake action because motorized watercraft would be prohibited.

Alternative F (Preferred Alternative)

Opportunities for Boaters – Soil impacts would be similar to those in Alternatives A and B regarding no limits on the number of boaters and related potential soil impacts. Soils would be protected by management adjustments when standard and indicators (Appendix K) are reached or exceeded. Desired Future Condition (DFC) indicates that soil erosion from human use would be minimal and areas around campsites would support natural vegetation.

Camping Facilities – Providing additional Level 1 sites in the recreation segments of the river and additional Level 2 sites between Fort Benton and Judith Landing could increase the number of recreation users, resulting in increased soil and vegetation disturbances. Soil compaction, erosion, and decreased soil productivity would increase in recreational use areas. However, creating improved facilities could shift recreational use, thus confining the disturbances to developed areas. There is the potential for short-term (less than a year) localized soil compaction and erosion during the construction of Level 1 and 2 sites.

Restricting the duration of overnight camping at Level 2 sites, during core use periods on the river, could result in fewer recreational user disturbances to soils and vegetation at those sites.

Motorized Watercraft – Wakes from motorized watercraft could impact shore stability, resulting in increased sediment in the Missouri River. However, these effects would be minimal in areas where there is deep root riparian vegetation which armors and stabilizes soils on stream/river banks.

Uplands SRMA

Alternative A (Current Management)

Continual use in dispersed camping areas could create long-term impacts to soils and vegetation. Soil compaction could increase, resulting in decreased site production and soil productivity at those sites.

Alternative B

Providing more Level 1, 2 and 3 sites could increase the number of recreation users, resulting in increased soil and vegetation disturbances. Soil compaction and erosion could increase and soil productivity could decrease in recreational use areas. However, creating improved facilities could confine the disturbances to those developed areas, assuming recreational use is shifted to those areas. There is the potential for short-term (less than a year) localized soil compaction and erosion during the construction of Level 1 and 2 sites.

Alternative C

Soil impacts would be similar to those in Alternative B, except soil disturbances from vehicular travel could be less because of the shorter distances to Level 1 sites.

Alternative D

Providing no Level 1 sites could reduce visitor use, resulting in fewer soil disturbances associated with these sites. However, not having improved facilities could increase soil disturbance at the Level 3 sites and dispersed opportunity areas. Impacts would depend on the frequency and circumstance of use.

Alternative E

Providing no Level 1 and 2 sites could reduce visitor use, resulting in fewer soil disturbances associated with these sites. However, not having improved facilities could increase soil disturbance at Level 3 sites and dispersed (Level 4) opportunity areas. Impacts would depend on frequency and the circumstances of use.

Alternative F (Preferred Alternative)

Providing additional Level 1 sites in the recreation segments of the river and additional Level 2 sites between Fort Benton and Judith Landing could increase the number of recreation users, resulting in increased soil and vegetation disturbances. Soil compaction, erosion, and decreased soil productivity would increase in recreational use areas. However, creating improved facilities could shift recreational use, thus confining the disturbances to developed areas. There is the potential for short-term (less than a year) localized soil compaction and erosion during the construction of Level 1 and 2 sites.

Impacts to Soils from Natural Gas Exploration and Development

Introduction

Natural gas development would impact soils during exploration, drilling, production and abandonment; resulting in bare soil exposure, potential compaction, mixed soil horizons, increased susceptibility of water and wind erosion, loss of topsoil, and decreased soil productivity. These impacts could result in potential accelerated erosion, runoff, and off-site sedimentation, and a subsequent increase in the loss of the resource. Accelerated soil erosion would occur when protective vegetative cover and litter is removed, exposing bare soil.

Accelerated soil erosion and resulting sedimentation would be difficult to distinguish from natural erosion rates because of the minimal amounts of soil disturbance from natural gas development compared to the relatively high natural erosion rates throughout the Monument. Wind erosion would be minor with the exception of dust resulting from vehicle traffic. Activities that could cause these impacts include construction and operation of well sites, pits, access roads, pipelines, and ancillary facilities. Impacts are both short-term (well pads and pipelines) and long-term (access roads and production areas). After reclamation and vegetation is re-established, there would be minimal or no residual effects. Impacts would be greatest on shallow soils with relatively low vegetative cover and soils on steep and very steep slopes.

Site-specific mitigation measures would be implemented to minimize impacts to the soil resource. To control erosion and sedimentation, construction activities would be designed following BMPs, standard operating procedures, and guidance from Surface Operating Standards for Oil and Gas Exploration and Development (the Gold Book).

To reduce soil loss, activities should be avoided on badlands, steep/very steep slopes, slopes susceptible to mass failure, and other areas subject to active erosion.

Interim reclamation of areas not needed for production and operations would be initiated immediately after completion of a well. Once vegetation is re-established, soil conditions should return to natural conditions within 1 to 3 years. Generally, soil erosion rates are greater on recently rehabilitated areas and decrease over time to natural levels in about 3 years. Areas needed for production on a well site, access road and facilities would require a long-term commitment of the soil resource. These sites remain nonproductive and continue to be at risk of erosion until abandonment and reclamation.

Vehicular/equipment traffic associated with exploration, development and production of natural gas could cause soil compaction and rutting. Severity is dependent on soil type, soil moisture, vegetative cover, frequency and weight (lbs./sq. inch) of equipment. Soils are the most susceptible to compaction and rutting during moist or wet conditions. Soils could be impacted by fluid spills such as engine oil, hydraulic oil and fuel (gasoline or diesel), and leaks within pipeline infrastructure. These spills and leaks could severely affect soil in localized areas; excessive concentrations may cause soil sterilization.

Oil and Gas Lease Stipulations and Conditions of Approval

Alternative A (Current Management)

West HiLine Leases – Soils would be protected by a stipulation intended to maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep and very steep slopes, and to avoid areas subject to slope failure, mass wasting, piping and/or having excessive reclamation problems.

The stipulation states that surface use or occupancy within special areas would be strictly controlled, or if absolutely necessary, excluded. Special areas in this case would be slopes over 30%, or 20% on extremely erodable or slumping soils. Use or occupancy would be restricted only when the BLM demonstrates the restriction is necessary for the protection of such special areas. If it were demonstrated that the impacts from the proposed surface use or occupancy to the soil resource could not be mitigated, the authorized officer would have the authority to exclude surface use or occupancy. This would provide protection to the soil resource where erosion could not be effectively controlled or site productivity returned. About 3,394 of the 10,328 acres of oil and gas leases are on slopes 30% and greater and on slopes 20% and greater with severely erosive and/or slumping soils.

Soils would be stabilized by vegetative cover and accelerated erosion potential would be eliminated within 1 to 3 years following reclamation.

Based on the RFD, there could be one new well site on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Non-West HiLine Leases – Soils would be protected by a condition of approval intended to maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep and very steep slopes, and to avoid areas subject to slope failure, mass wasting, piping and/or having excessive reclamation problems.

Restricting surface disturbance on slopes over 30% or on slopes over 20% with severely erodable and/or slumping soils would reduce the potential for accelerated soil erosion from disturbance on steep slopes. This stipulation would be applied to leases dated after 1973. Three leases dated between July 1971, and May 1973, have lease term stipulations that state approval would be conditioned on reasonable requirements needed to prevent soil erosion. Leases prior to 1971 contain no specific soil lease stipulations other than the standard lease terms and conditions (200 meters or 60 days).

Use or occupancy would be restricted only when the BLM demonstrates the restriction is necessary to protect the resource. If the soil impacts from the proposed surface use or occupancy cannot be mitigated, the authorized officer would have the authority to exclude surface use or occupancy. This would protect the soil resource where erosion could not be effectively controlled or site productivity returned. About 10,687 of the 32,477 acres of oil and gas leases are on slopes 30% and greater and on slopes 20% and greater with severely erosive and/or slumping soils.

Based on the RFD, there is no potential for new well sites on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Alternative B

West HiLine Leases – Soils would be protected by a condition of approval intended to maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep and very steep slopes, and to avoid areas subject to slope failure, mass wasting, piping and/or having excessive reclamation problems. About 1,683 of the 10,328 acres of oil and gas leases are on slopes 30% and greater.

Based on the RFD, there could be one new well site on slopes 30% and greater.

Non-West HiLine Leases – Soils would be protected by a condition of approval intended to maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep and very steep slopes, and to avoid areas subject to slope failure, mass wasting, piping and/or having excessive reclamation problems. About 5,352 of the 32,477 acres of oil and gas leases are on slopes 30% and greater.

Based on the RFD, there could be one new well site on slopes 30% and greater.

Alternative C

West HiLine Leases – This alternative would place additional restrictions and requirements on natural gas development to protect soil resources. Soils would be protected by a condition of approval intended to maintain soil productiv-

ity, provide necessary protection to prevent excessive soil erosion on steep and very steep slopes, and to avoid areas subject to slope failure, mass wasting, piping and/or having excessive reclamation problems. About 3,394 of the 10,328 acres of oil and gas leases are on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Based on the RFD, there would be no new well sites on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Non-West HiLine Leases – This alternative would place additional restrictions and requirements on natural gas development to protect soil resources. Soils would be protected by a condition of approval intended to maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep and very steep slopes, and to avoid areas subject to slope failure, mass wasting, piping and/or having excessive reclamation problems. About 10,687 of the 32,477 acres of oil and gas leases are on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Based on the RFD, there is no potential for new well sites on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils. There would be no new access roads on slopes 40% and greater.

Alternative D

West HiLine Leases – These alternatives would place additional restrictions and requirements on natural gas development to protect soil resources. Soils would be protected by a condition of approval intended to maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep and very steep slopes, and to avoid areas subject to slope failure, mass wasting, piping and/or having excessive reclamation problems. About 3,394 of the 10,328 acres of oil and gas leases are on slopes 30% and greater and on slopes 20% and greater with severely erosive and/or slumping soils.

Based on the RFD, there is no potential for new well sites on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Non-West HiLine Leases – This alternative would place additional restrictions and requirements on natural gas development to protect soil resources. Soils would be protected by a condition of approval intended to maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep and very steep slopes, and to avoid areas subject to slope failure, mass wasting, piping and/or having excessive reclamation problems. About 10,687 of the 32,477 acres of oil and gas leases are on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Based on the RFD, there is no potential for new well sites on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Alternative E

West HiLine Leases – Prohibiting surface occupancy and use on slopes 20% and greater would protect soils from potential water erosion on steep slopes. All operations would be avoided on slopes greater than 20%.

About 3,398 of the 10,328 acres of oil and gas leases are on slopes 20% and greater. Based on the RFD, there would be no wells drilled on BLM-managed mineral estate within the next 15 to 20 years.

Non-West HiLine Leases – Prohibiting surface occupancy and use on slopes 20% and greater would protect soils from potential water erosion on steep slopes. All operations would be avoided on all slopes greater than 20%. About 11,616 of the 32,477 acres of oil and gas leases are on slopes 20% and greater.

Alternative F (Preferred Alternative)

West HiLine Leases – This alternative would place additional restrictions and requirements on natural gas development to protect soil resources. Soils would be protected by a condition of approval intended to maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep and very steep slopes, and to avoid areas subject to slope failure, mass wasting, piping and/or having excessive reclamation problems. About 3,394 of the 10,328 acres of oil and gas leases are on slopes 30% and greater and on slopes 20% and greater with severely erosive and/or slumping soils.

It is BLM's experience that operations on slopes 20% and greater can be successfully reclaimed and erosion can be effectively controlled. Reclamation practices, devices and equipment continue to improve and have demonstrated that site productivity can be returned on slopes 20% and greater; therefore, reasonable performance-based exceptions could be granted.

Soils would be stabilized by vegetative cover and accelerated erosion potential would be eliminated within 1 to 3 years following reclamation.

Based on the RFD, there could be one new well site on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Non-West HiLine Leases – This alternative would place additional restrictions and requirements on natural gas development to protect soil resources. Soils would be protected by a condition of approval intended to maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep and very steep slopes, and to avoid areas subject to slope failure, mass wasting, piping and/or having excessive reclamation problems. About 10,687 of the 32,477 acres of oil and gas leases are on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Based on the RFD, there could be one new well site on slopes 30% and greater or on slopes 20% and greater with severely erosive and/or slumping soils.

Natural Gas Operations

Alternative A (Current Management)

Seismic Allowing all types of seismic operations could lead to short-term soil compaction and rutting in areas of operation; resulting in increased surface runoff and subsequent erosion. Impacts would be greatest on shallow, sparsely vegetated soils on steep and very steep slopes.

Drilling Operations – Based on the RFD, there could be 35 new natural gas wells (in addition to the 12 existing wells) drilled on federal minerals in the Monument, most likely within the next 15 to 20 years. This would disturb 71 acres in addition to the 136 existing acres of soil for the construction of the well sites, access roads and pipelines. Interim reclamation of areas not needed for production and operations would be initiated immediately after completion. Rehabilitating parts of the well pads and pipelines during production would reduce soil disturbance to 24 acres. There would be a long-term commitment of the soil resource on 23 acres required for access roads and facilities.

Soils would be stabilized by vegetative cover, and accelerated erosion potential would be eliminated within 1 to 3 years following reclamation.

Access with no restrictions could result in soil rutting and compactions from vehicle and equipment movement during wet/moist soil conditions.

Based on the RFD, there is the potential for 216 feet of new access roads on slopes 30% and greater and on slopes 20% and greater with severely erosive and/or slumping soils. These are not contiguous feet, rather a representation of cumulative segments of roads.

Production Facilities and Equipment – Pipelines allowed cross-country would disturb soils and the protective vegetation during installation. This would result in short-term (1 to 2 years) localized accelerated soil erosion. Design standards and mitigation measures would reduce the severity of the impacts to soils and require prompt revegetation of the disturbed areas. Soil conditions and site productivity could easily be returned with proper design, construction methods and reclamation practices.

Alternative B

Seismic – Allowing all types of seismic operations could lead to short-term soil compaction and rutting, resulting in increased surface runoff and subsequent erosion. Impacts would be greatest on shallow, sparsely vegetated soils on steep and very steep slopes.

Drilling Operations – Based on the RFD, there could be 44 new natural gas wells (in addition to the 12 existing wells) drilled on federal minerals in the Monument, most likely within the next 15 to 20 years. This would disturb 104 acres in addition to the 136 existing acres of soil for the construction of the well sites, access roads and pipelines. Rehabilitating parts of the well pads and pipelines during production would reduce soil disturbance to 28 acres. A long-term commitment of the soil resource on 28 acres would be required for access roads and facilities.

Soils would benefit by requiring minimal surface disturbance, the use of low-impact drilling technology, and developing multiple wells from one location. Fewer acres of bare soils would be exposed to raindrop impact, runoff and wind erosion. Sites and access roads would be avoided in areas where soil impacts could not be mitigated or effectively controlled and where reclamation activities would fail.

Access with no restrictions could result in soil rutting and compactions from vehicle and equipment movement during wet/moist soil conditions.

Based on the RFD, there is the potential for 174 feet of new access roads on slopes 30% and greater. These are not contiguous feet, rather a representation of cumulative segments of roads.

Production Facilities and Equipment – Pipelines allowed cross-country would disturb soils and the protective vegetation during installation. This would result in short-term (1 to 2 years) localized accelerated soil erosion. Design standards and mitigation measures would reduce the severity of the impacts to soils and require prompt revegetation of the disturbed areas. Soil conditions and site productivity could easily be returned with proper design, construction methods and reclamation practices.

Alternative C

Seismic – Soil disturbance would be confined to designated roads. Where exceptions could be granted for off-road

travel, soil compaction and rutting could occur in areas of operation; resulting in increased surface runoff and subsequent erosion. Impacts would be minimal because surface disturbance would require mitigation. Soils mitigation would include avoiding steep and very steep slopes with heavy equipment and avoiding operations during moist/wet soil conditions.

Drilling Operations – Based on the RFD, there could be 28 new natural gas wells (in addition to the 12 existing wells) drilled on federal minerals in the Monument, most likely within the next 15 to 20 years. This would disturb 56 acres in addition to the 136 existing acres of soil for the construction of the well sites, access roads and pipelines. Rehabilitating parts of the well pads and pipelines during production would reduce soil disturbance to 21 acres. A long-term commitment of the soil resource on 21 acres would be required for access roads and facilities.

As in Alternative B, soils would benefit by requiring minimal surface disturbance, the use of low impact drilling technology, and developing multiple wells from one location.

Restricting travel to the minimal vehicle needed for the job and possible timing restrictions could reduce the potential for soil rutting and compaction from vehicle and equipment movement during wet/moist conditions.

Based on the RFD, there is the potential for 1,542 feet of new access roads on slopes 30% and greater and on slopes 20% and greater with severely erosive and/or slumping soils. These are not contiguous feet, rather a representation of cumulative segments of roads. There would be no new access roads on slopes 40% and greater.

Production Facilities and Equipment – Requiring new pipelines to stay within existing disturbances or access roads would result in no additional soil disturbances. Soil disturbances and erosion would result from the construction and use of the access roads or disturbance area.

Pipelines authorized to deviate from existing disturbance corridors would disturb soils and the protective vegetation during installation. This would result in short-term (1 to 2 years) localized accelerated soil erosion. Design standards and mitigation measures would reduce the severity of the impacts to soils and require prompt re-vegetation of the disturbed areas. Soil conditions and site productivity could easily be returned with proper design, construction methods and reclamation practices.

Alternative D

Seismic – Soil disturbance would be confined to designated roads with no exceptions. Operations would not be allowed during moist/wet soil conditions.

Drilling Operations – Based on the RFD, there could be 13 new natural gas wells (in addition to the 12 existing wells) drilled on federal minerals in the Monument, most likely within the next 15 to 20 years. This would disturb 15 acres in addition to the 136 existing acres of soil for the construction of the well sites, access roads and pipelines. Rehabilitating parts of the well pads and pipelines during production would reduce soil disturbance to 16 acres. A long-term commitment of the soil resource on 16 acres would be required for access roads and facilities.

As in Alternative B, soils would benefit by requiring minimal surface disturbance, the use of low-impact drilling technology, and developing multiple wells from one location.

Restricting travel to the minimal vehicle needed for the job and possible timing restrictions could reduce the potential for soil rutting and compaction from vehicle and equipment movement during wet/moist conditions.

Production Facilities and Equipment – Requiring new pipelines to stay within existing disturbances or access roads would result in no additional soil disturbances from pipeline installation. Soil disturbances and erosion would be a result of the construction and use of the access roads or disturbance area.

Alternative E

Seismic – Soil disturbance would be confined to designated roads with no exceptions. Operations would not be allowed during moist/wet soil conditions.

Drilling Operations – Based on the RFD, there would be no new natural gas wells drilled on federal minerals in the Monument. The existing 12 wells currently disturb 136 acres of soil from the well sites, access roads and pipelines. Rehabilitating parts of the well pads and pipelines during production would reduce soil disturbance to 14 acres. There would be a long-term commitment of the soil resource on 14 acres required for access roads and facilities.

As in Alternative B, soils would benefit by requiring minimal surface disturbance, the use of low impact drilling technology, and developing multiple wells from one location.

Restricting travel to the minimal vehicle needed for the job and possible timing restrictions could reduce the potential for soil rutting and compaction from vehicle and equipment movement during wet/moist conditions.

Production Facilities and Equipment – Requiring new pipelines to stay within existing disturbances or access roads would result in no additional soil disturbances from pipeline installation. Soil disturbances and erosion would

be a result of the construction and use of the access roads or disturbance area.

Alternative F (Preferred Alternative)

Seismic – Soil disturbance would be confined to designated roads. Where exceptions are granted for off-road travel, soil compaction and rutting could occur in areas of operation; resulting in increased surface runoff and subsequent erosion. Impacts would be minimal because surface disturbance would be mitigated. Mitigation for soils would include avoiding steep and very steep slopes with heavy equipment and avoiding operations during moist/wet soil conditions.

Explosions from surface blasting would cause localized surface disturbance. Surface disturbances created, such as mounds or craters, would be restored to the original contour.

Drilling Operations – Based on the RFD, there could be 34 new natural gas wells (in addition to the 12 existing wells) drilled on federal minerals in the Monument, most likely within the next 15 to 20 years. This would disturb 73 acres in addition to the 136 existing acres of soil for the construction of the well sites, access roads and pipelines. Interim reclamation of areas not needed for production and operations would be initiated immediately after completion of construction. Rehabilitating parts of the well pads and pipelines during production would reduce soil disturbance to 24 acres. A long-term commitment of the soil resource on 24 acres would be required for access roads and facilities.

Soils would be stabilized by vegetative cover and accelerated erosion potential would be eliminated within 1 to 3 years following reclamation.

Soils would benefit by requiring minimal surface disturbance, the use of low-impact drilling technology, and developing multiple wells from one location. Fewer acres of bare soils would be exposed to raindrop impact, runoff and wind erosion. Sites and access roads would be avoided in areas where soil impacts could not be mitigated or effectively controlled and where reclamation activities would fail.

Restricting travel to the minimal vehicle needed for the job and possible timing restrictions could reduce the potential for soil rutting and compaction from vehicle and equipment movement during wet/moist conditions.

Based on the RFD, there is the potential for 935 feet of new access roads on slopes 30% and greater and on slopes 20% and greater with severely erosive and/or slumping soils. These are not contiguous feet, rather a representation of cumulative segments of roads. There would be no new access roads on slopes 40% and greater.

Production Facilities and Equipment – Requiring new pipelines to stay within existing disturbances or access roads would result in no additional soil disturbances from pipeline installation. Soil disturbances and erosion would be a result of the construction and use of the access roads or disturbance area.

Pipelines authorized to deviate from existing disturbance corridors would disturb soils and the protective vegetation during installation. This would result in short-term (1 to 2 years) localized accelerated soil erosion. Design standards and mitigation measures would reduce the severity of the impacts to soils and require prompt re-vegetation of the disturbed areas. Soil conditions and site productivity can easily be returned with proper design, construction methods and reclamation practices.

Impacts to Soils from Access and Transportation

Introduction

As visitation increases, vehicular travel on roads could increase disturbances to soils; resulting in increased soil erosion, compaction, rutting and surface runoff. The severity of disturbance would depend upon soil conditions (wet/moist vs. dry/frozen), frequency, vehicle weight (lbs. /sq. inch), tire width/tread, and driver type. Impacts would be greatest in areas of concentrated use that are not maintained or improved and would be mostly confined to the roadways. Compaction could occur to the extent that natural re-vegetation could not occur and some sort of mechanical treatment would be required. Vehicular travel during wet soil conditions could lead to rutting and creating alternative routes. Ruts provide a channel for concentrated flow to accelerate soil erosion. Rutting hazard is high due to low soil strength in the planning area.

BLM roads that are properly graded and maintained would provide for improved road conditions. This could result in decreased soil disturbances associated with creating parallel/braided roads and associated runoff and subsequent erosion.

Roads with poor design on steep slopes would be the most susceptible to erosion due to high surface runoff, compacted surfaces and lack of vegetative cover. Roads with poor design also have been identified as a major source and contributor of sediment.

Appropriate design standards that minimize surface runoff and subsequent soil erosion would be required for new roads. This would include avoiding severely erosive and

slumping hazard areas; fitting roads to the topography; locating roads on natural benches, stable and well-drained soils; and avoiding long, sustained, steep road grades (Appendix G).

Access

Alternatives A (Current Management) and B

Allowing the public on new resource roads for natural gas operations could increase the frequency and numbers of vehicles disturbing soils on those roads. There would be the potential for an increase in soil erosion, compaction and rutting over-and-beyond what could occur from the routine operations and maintenance of producing wells. Soil impacts would be minor because of required design standards that effectively control surface runoff and erosion on new roads.

Alternatives C, D, E, and F (Preferred Alternative)

Restricting public access on new resource roads for natural gas operations to specified areas and from all sensitive areas could reduce the frequency of soil disturbances. Soil disturbance would continue from routine operations and maintenance of producing wells.

BLM Road System

Alternative A (Current Management)

All existing BLM roads would be open, unless currently restricted by the West HiLine RMP, Judith-Valley-Phillips RMP, or completed watershed or activity plans. This could increase the number of vehicles traveling over and disturbing soils and vegetation; resulting in increased compaction, rutting and subsequent runoff and erosion. Soil impacts would be greatest under this alternative, as it would provide the most miles of open roads.

Open roads (or segments of roads) on soils with severe erosion susceptibility would require further investigation by the BLM to determine if mitigation and/or a higher level of maintenance would be needed to control erosion and/or increase stability.

Exceptions – Administrative use off road and on closed roads for the BLM, other federal, state and county agencies, lessees and permittees would not occur frequently enough, over the same route, to result in substantial accelerated soil erosion and the development of new roads. However, there is the potential for soil compaction and rutting if these actions occur during wet or moist soil conditions.

Motorized or mechanized vehicles would not be allowed to pull off designated routes for camping and would not create any soil impacts.

Alternative B

Open roads (or segments of roads) with severe erosion susceptibility would require further investigation by the BLM to determine if mitigation and/or a higher level of maintenance would be needed to control erosion and/or increase stability. Road design and maintenance would be evaluated. If necessary, the BLM may close or reroute (if possible) these roads/segments. This would protect soils, where erosion and slope stability are concerns.

Soils on closed roads would become productive once vegetation is returned (naturally or mechanically) and erosion is controlled.

Exceptions – Administrative use off road and on closed roads for the BLM, other federal, state and county agencies, lessees and permittees would not occur frequently enough, over the same route, to result in substantial accelerated soil erosion and the development of new roads. However, there is the potential for soil compaction and rutting if these actions occur during wet or moist soil conditions.

Allowing motorized or mechanized vehicles to pull off designated routes up to 300 feet for camping could result in new parallel tracks. This would depend on factors such as soil conditions (wet/moist vs. dry/frozen), frequency, and vehicle weight (lbs./sq. inch). In areas of concentrated use, soils could become compacted and rutted. Soil impacts would likely be less than 100 acres.

Alternative C

Open roads (or segments of roads) with severe erosion susceptibility would require further investigation by the BLM to determine if mitigation and/or a higher level of maintenance would be needed to control erosion and/or increase stability. Road design and maintenance would be evaluated. If necessary, the BLM may close or reroute (if possible) these roads/segments. This would result in protection to soils where erosion and slope stability are concerns.

Soils on closed roads would become productive once vegetation is returned (naturally or mechanically) and erosion is controlled.

Exceptions – Administrative use on closed roads for the BLM, other federal, state and county agencies would not occur frequently enough, over the same route, to result in substantial accelerated soil erosion and the development of new roads. Administrative use off road and on closed roads

by lessees and permittees would not occur frequently enough to result in substantial accelerated soil erosion and the development of new roads. However, there is the potential for soil compaction and rutting if these actions occur during wet or moist soil conditions.

Allowing motorized or mechanized vehicles to pull off designated routes up to 150 feet for camping could result in new parallel tracks. This would depend on factors such as soil conditions (wet/moist vs. dry/frozen), frequency, and vehicle weight (lbs./sq. inch). In areas of concentrated use, soils could become compacted and rutted. Soil impacts would likely be less than 50 acres.

Alternative D

Open roads (or segments of roads) with severe erosion susceptibility would require further investigation by the BLM to determine if mitigation and/or a higher level of maintenance would be needed to control erosion and/or increase stability. Road design and maintenance would be evaluated. If necessary, the BLM may close or reroute (if possible) these roads/segments which would protect soils where erosion and slope stability are concerns.

Soils on closed roads would become productive once vegetation is returned (naturally or mechanically) and erosion is controlled.

Exceptions – Administrative use off-road and on closed roads for the BLM, other federal, state and county agencies, lessees and permittees would have the same impacts as Alternatives A and B.

Allowing motorized or mechanized vehicles to pull off designated routes up to 10 feet for camping could result in new parallel tracks. This would depend on factors such as soil conditions (wet/moist vs. dry/frozen), frequency, and vehicle weight (lbs./sq. inch). In areas of concentrated use, soils could become compacted and rutted. Soil impacts would likely be less than 20 acres.

Alternative E

This alternative would create the fewest soil impacts as it would allow the fewest miles of open roads.

Open roads (or segments of roads) with severe erosion susceptibility would require further investigation by the BLM to determine if mitigation and/or a higher level of maintenance would be needed to control erosion and/or increase stability. Road design and maintenance would be evaluated. If necessary, the BLM may close or reroute (if possible) these roads/segments, which would protect soils where erosion and slope stability are concerns.

Soils on closed roads would become productive once vegetation is returned (naturally or mechanically) and erosion is controlled.

Exceptions – There would be no soil impacts from off-road travel associated with administrative use from the BLM, other federal, state and county agencies as it would not be allowed.

Restrictions for travel off road and on closed roads, during wet soil conditions, could be implemented on a case-by-case basis for lessees and permittees. This could reduce potential soil compaction, rutting and development of unauthorized alternate routes and roads.

Motorized or mechanized vehicles would not be allowed to pull off designated routes for camping and would not create any soil impacts

Alternative F (Preferred Alternative)

Open roads (or segments of roads) with severe erosion susceptibility would require further investigation by the BLM to determine if mitigation and/or a higher level of maintenance would be needed to control erosion and/or increase stability. Road design and maintenance would be evaluated. If necessary, the BLM may close or reroute (if possible) these roads/segments, which would protect soils where erosion and slope stability are concerns.

Soils on closed roads would become productive once vegetation is returned (naturally or mechanically) and erosion is controlled.

Exceptions – Administrative use off road and on closed roads for the BLM, other federal, state and county agencies, lessees and permittees would not occur frequently enough, over the same route, to result in substantial accelerated soil erosion and the development of new roads. However, there is the potential for soil compaction and rutting if these actions occur during wet or moist soil conditions.

Allowing motorized or mechanized vehicles to pull off designated routes up to 300 feet for camping could result in new parallel tracks. This would depend on factors such as soil conditions (wet/moist vs. dry/frozen), frequency, and vehicle weight (lbs./sq. inch). In areas of concentrated use, soils could become compacted and rutted. Soil impacts would likely be less than 100 acres.

There would be no soil impacts in the WSAs because motorized or mechanized vehicles would not be allowed to pull off designated routes for camping.

Aviation

Alternatives A (Current Management) and B

Soils would be susceptible to wind erosion where vegetative cover is removed and soils are bare. These impacts could occur on approximately 20 acres.

Alternative C

Soils would be susceptible to wind erosion where vegetative cover has been removed and soils are bare. These impacts could occur on approximately 14 acres.

Alternative D

Soils would be susceptible to wind erosion where vegetative cover has been removed and soils are bare. These impacts could occur on approximately 12 acres.

Alternative E

Once airstrips are revegetated (naturally or mechanically) impacts to soils would cease.

Alternative F (Preferred Alternative)

Soils could be susceptible to wind erosion where vegetative cover has been removed and soils are bare. These impacts could occur on approximately 12 acres.

Summary of Cumulative Impacts to Soils

Alternative A (Current Management)

The BLM's past, present and future objectives are to maintain and/or improve soil productivity by increasing vegetation cover and reducing erosion. All surface-disturbing activities would be subject to an onsite evaluation to develop mitigation to reduce erosion and soil compaction and improve soil stability and salinity control. This has resulted in an overall improvement in soil productivity and watershed health within the planning area. Soil improvements would continue under this alternative.

Surface-disturbing activities could contribute cumulatively to increased soil compaction, surface runoff and a subsequent increase in soil erosion and sedimentation. These activities could also decrease soil productivity throughout the planning area; however, surface-disturbing activities would require mitigation as described above. Direct and indirect activities that favor wildlife habitat, maintain or increase PFC in the uplands and riparian areas/wetlands, mitigate natural gas development, and road maintenance would protect soil resources and offset impacts. Guidance from BMPs, Standards for Rangeland Health and design standards would be followed to minimize and mitigate soil impacts.

Within the next 15 to 20 years, an additional 56 wells could be drilled on federal leases in or within 1/2 mile of the Monument. This would result in 107 acres of soil disturbances. Interim reclamation would reduce this figure to 33 acres. Cumulatively, less than 1% of soils would be impacted from surface disturbance associated with natural gas development in the planning area.

Alternative B

The BLM's past, present and future objectives are to maintain and/or improve soil productivity by increasing vegetation cover and reducing erosion. All surface-disturbing activities would be subject to an onsite evaluation to develop mitigation to reduce erosion and soil compaction, and improve soil stability and salinity control. This has resulted in an overall improvement in soil productivity and watershed health within the planning area. The soil improvements would continue under this alternative.

Surface-disturbing activities could contribute cumulatively to increase soil compaction, surface runoff, and a subsequent increase in soil erosion and sedimentation and decreased soil productivity throughout the planning area; however, surface-disturbing activities would require mitigation as described above. Direct and indirect activities that favor wildlife habitat, maintain or increase PFC in the uplands and riparian areas/wetlands, mitigate natural gas development, and reroute or mitigate roads with severe erosion problems would protect soil resources and offset impacts. Guidance from BMPs, Standards for Rangeland Health and design standards would be followed to minimize and mitigate soil impacts.

Within the next 15 to 20 years, an additional 67 wells could be drilled on federal leases in or within 1/2 mile of the Monument. This would result in 144 acres of soil disturbances. Interim reclamation would reduce this figure to 39 acres. Cumulatively, less than 1% of soils would be impacted from surface disturbance associated with natural gas development in the planning area.

Alternative C

The BLM's past, present and future objectives are to maintain and/or improve soil productivity by increasing vegetation cover and reducing erosion. All surface-disturbing activities would be subject to an onsite evaluation to develop mitigation to reduce erosion and soil compaction and improve soil stability and salinity control. This has resulted in an overall improvement in soil productivity and watershed health within the planning area. The soil improvements would continue under this alternative.

Surface-disturbing activities could contribute cumulatively to increase soil compaction, surface runoff and a subsequent increase in soil erosion and sedimentation. These activities could also decrease soil productivity throughout the planning area; however, surface-disturbing activities would require mitigation as described above. Direct and indirect activities that favor wildlife habitat, maintain or increase PFC in the uplands and riparian areas/wetlands, mitigate natural gas development, and reroute or mitigate roads with severe erosion problems would protect soil resources and offset impacts. Guidance from BMPs, Standards for Rangeland Health and design standards would be followed to minimize and mitigate soil impacts.

Within the next 15 to 20 years, an additional 49 wells could be drilled on federal leases in or within 1/2 mile of the Monument. This would result in 92 acres of soil disturbances. Interim reclamation would reduce this figure to 31 acres. Cumulatively, less than 1% of soils would be impacted from surface disturbance associated with natural gas development in the planning area.

Alternative D

The BLM's past, present and future objectives are to maintain and/or improve soil productivity by increasing vegetation cover and reducing erosion. All surface-disturbing activities would be subject to an onsite evaluation to develop mitigation to reduce erosion and soil compaction and improve soil stability and salinity control. This has resulted in an overall improvement in soil productivity and watershed health within the planning area. The soil improvements would continue under this alternative.

Surface-disturbing activities, as described in this alternative and in the Impacts to Soils Common to All Alternatives section, could contribute cumulatively to increase soil compaction, surface runoff, and a subsequent increase in soil erosion and sedimentation. These activities also decrease soil productivity throughout the planning area; however, surface-disturbing activities would require mitigation as described above. Direct and indirect activities that favor wildlife habitat, maintain or increase PFC in the uplands and riparian areas/wetlands, mitigate natural gas development, and close most roads that do not serve a specific purpose would protect soil resources and offset impacts. Guidance from BMPs, Standards for Rangeland Health and design standards would be followed minimize and mitigate soil impacts.

Within the next 15 to 20 years, an additional 33 wells could be drilled on federal leases in or within 1/2 mile of the Monument. This would result in 50 acres of soil disturbances. Interim reclamation would reduce this to 25 acres. Cumulatively, less than 1% of soils would be impacted from surface disturbance associated with natural gas development in the planning area.

Alternative E

The BLM's past, present and future objectives are to maintain and/or improve soil productivity by increasing vegetation cover and reducing erosion. All surface-disturbing activities would be subject to an onsite evaluation to develop mitigation to reduce erosion and soil compaction and improve soil stability and salinity control. This has resulted in an overall improvement in soil productivity and watershed health within the planning area. The soil improvements would continue under this alternative.

Overall, this alternative would allow the fewest soil impacts because it is the most restrictive on surface-disturbing activities which could contribute cumulatively to increased soil compaction, surface runoff, and a subsequent increase in soil erosion and sedimentation. These activities could also decrease soil productivity throughout the planning area; however, surface-disturbing activities would require mitigation as described above. Direct and indirect activities that favor wildlife habitat, maintain or increase PFC in the uplands and riparian areas/wetlands, mitigate natural gas development, and close most roads would protect soil resources and offset impacts. Guidance from BMPs, Standards for Rangeland Health and design standards would be followed to minimize and mitigate soil impacts.

Within the next 15 to 20 years, an additional 18 wells could be drilled on federal leases in or within 1/2 mile of the Monument. This would result in 33 acres of soil disturbances. Interim reclamation would reduce this figure to 24 acres. Cumulatively, less than 1% of soils would be impacted from surface disturbance associated with natural gas development in the planning area.

Alternative F (Preferred Alternative)

The BLM's past, present and future objectives are to maintain and/or improve soil productivity by increasing vegetation cover and reducing erosion. All surface-disturbing activities would be subject to an onsite evaluation to develop mitigation to reduce erosion and soil compaction and improve soil stability and salinity control. This has resulted in an overall improvement in soil productivity and watershed health within the planning area. The soil improvements would continue under this alternative.

Surface-disturbing activities, as described in this alternative and in the Impacts to Soils Common to All Alternatives section, could contribute cumulatively to increase soil compaction, surface runoff, and a subsequent increase in soil erosion and sedimentation. These activities could also decrease soil productivity throughout the planning area; however, surface-disturbing activities would require mitigation as described above. Direct and indirect activities that favor wildlife habitat, maintain or increase PFC in the uplands and riparian areas/wetlands, mitigate natural gas

development, and re-route or mitigate roads with severe erosion problems would protect soil resources and offset impacts. Guidance from BMPs, Standards for Rangeland Health and design standards would be followed to minimize and mitigate soil impacts.

Within the next 15 to 20 years, an additional 55 wells could be drilled on federal leases in or within 1/2 mile of the Monument. This would result in 109 acres of soil disturbances. Interim reclamation would reduce this figure to 34 acres. Cumulatively, less than 1% of soils would be impacted from surface disturbance associated with natural gas development in the planning area.

Vegetation – Native Plants

Impacts to Vegetation – Native Plants Common to All Alternatives

Fish and Wildlife

Management actions to accommodate wildlife call for maintaining the diversity of vegetation in species composition, cover and structure. These benefits to vegetation would be subtle and infrequent.

Actions to improve the quality and quantity of vegetation for upland birds encourage diversity in the composition and structure of vegetation communities. Vegetation treatments would be small-scale and emphasize creating diversity. Land treatments and controlled burns would change composition and structure of vegetation communities on the treatment area, but would not jeopardize overall vegetation and may lead to more productive vegetation in the short term. This occurs by removing old, mature and stagnated plants, removing plants that are shading out other plants, altering the balance of nutrients in the area and freeing up some nutrients, and providing sites for plants to grow earlier in the spring with less competition for moisture. It is also possible that vegetation treatments may cause a shift in use areas by livestock and wildlife which would reduce vegetation use in other areas.

Actions to protect shorelines at specific reservoirs would enhance vegetation community development around the reservoir, by allowing plants to become established and go through a complete life cycle in the season. The area impacted would vary depending on the number and size of the reservoirs. This action would provide some islands of vegetation but would not occur often, and overall would have little to no effect on vegetation.

Soils

Actions that maintain healthy soil conditions create good vegetation cover and diversity. Surface-disturbance activities could destroy vegetation and leave bare ground where invasive species would establish in the short term. Since mitigation for disturbances requires reclamation and establishment of suitable species, the long-term impacts on vegetation would be inconsequential.

Vegetation – Native Plants

With appropriate allocations (as established previously in watersheds or activity plans) vegetation to protect soil and plant health, vegetation composition, diversity, structure and productivity would be maintained. In addition, meeting the Standards for Rangeland Health would ensure maintaining healthy vegetation communities.

Water

Improving vegetation cover to reduce runoff and sedimentation goes hand-in-hand with healthy vegetation communities. This benefit would be subtle, but widespread over the entire Monument.

Livestock Grazing

Pursuing vegetation treatments (mechanical, chemical or burning) to meet management objectives would change vegetation composition, diversity, structure and/or productivity. Any vegetation treatment would receive further environmental analysis before implementation.

Recreation

Recreation activities have the potential to impact vegetation in localized areas where vehicles are parked, campsites are established, or recreational use livestock are being held. These impacts could be short-term trampling of vegetation, which could recover in a relatively short period. Extended use campsites, campfires and sites where recreational use livestock are tied or fed can lead to trampling of vegetation, surface disturbance, soil compaction and the introduction of invasive species. This impact would be localized and would not likely change vegetation communities. However, along the UMNWSR where available campsites are limited, the impact to the vegetation community could cause deterioration. These impacts would be mitigated by making alternative campsites available and educating the public in minimal impact camping techniques.

Fire

Any fire would have some impact on vegetation. The actual impact is highly variable and could be positive, benign, or

negative depending on the circumstances of the fire. Fire-related impacts include a change in vegetation composition, diversity, structure, cover and productivity. Hot season fires that have lots of fuel and burn slow and hot are likely to cause substantial changes in the vegetation community. Cool season fires that burn quickly and relatively cool in a mosaic pattern may increase diversity, composition and structure.

Short-term impacts are often quite different than long-term impacts.

On occasion, suppression activities such as using heavy equipment to construct bare-ground fire breaks, cause disturbance beyond those the fire could create.

Impacts to Vegetation – Native Plants from Health of the Land and Fire

Fish and Wildlife – Greater-Sage-Grouse

Alternative A (Current Management)

No additional impacts to vegetation would be anticipated.

Alternatives B, C, D, and E

Offsite water and adjusted grazing strategies would provide more rest and recovery for plants and improve grass and forb components of the vegetation. Protecting wet meadows would lead to better ground cover and a higher degree of diversity on specific sites.

Prescription burns could have varying effects on vegetation structure, diversity and productivity depending on the circumstances of the burn. There could also be a substantial difference in effect on a short-term versus long-term basis. In general, burns would reduce the cover provided by sagebrush species (on occasions to nearly 0% canopy cover) and set back successional levels and structure of vegetation. Burns would often lead to more homogeneous communities (reduced mosaic) in the short term, but in the long term can increase sharper community edges and a higher degree of mosaic than before the burn. Productivity in the grass and forb component of the plant community could increase for a year or two following the burn, but beyond 10 years the productivity often comes back to pre-burn levels if the same vegetation community redevelops.

Alternative F (Preferred Alternative)

Actions taken in the interest of sage-grouse would be favorable to vegetation because the emphasis would be on maintaining diversity in species composition, structure and cover. The actual areas that would be impacted by this action would be relatively small and therefore would not represent a substantial change in vegetation. Reclamation of disturbed areas and restoration of sagebrush would be in the interest of healthy vegetation communities.

Fish and Wildlife – Black-Tailed Prairie Dogs

Alternative A (Current Management)

Numerous small black-tailed prairie dog towns could reduce vegetative structure to a single layer and diversity to a few low-growing species, often at low successional levels on the town site. They also could reduce available forage for other birds and mammals (including livestock). Black-tailed prairie dog towns may also become focal points for establishing invasive species. These effects could result in not meeting Standards for Rangeland Health (specifically Standard #1 – Upland Health). Prairie dog towns would generally establish and expand on relatively flat or rolling landscapes that are either grasslands or shrub lands. They would not become established on steep slopes or under tree/forest areas. It is problematic to predict or quantify the acreage of vegetation that might be impacted, since the causes are complicated by many factors. Prairie dog towns would not alter large acreages of vegetation in the Monument; however, there may be localized circumstances where prairie dog towns could overwhelm an area that is confined by topography (a river bottom terrace, narrow ridge, etc.) and lead to deterioration in rangeland health.

Alternatives B, C, and D

Black-tailed prairie dog towns would be controlled if the towns would impact other resources or cause an allotment to not meet Standards for Rangeland Health. These would only be localized effects and would be inconsequential on the scale of the Monument.

Alternative E

No measures would be implemented to control prairie dogs or expansion of their towns. Like Alternative A, this could have the impact of reducing vegetation composition, structure and productivity in the localized area. Prairie dog towns could potentially expand onto private land where control measures would likely not be effective since prairie dogs would continually reoccupy the private land from the BLM land where they are not being controlled. There could be a reduction in the productivity of the vegetation since forage would be consumed by the prairie dogs and not be available for watershed protection, livestock or wildlife. There could be some secondary influence (higher use levels) on vegetation away from prairie dog towns if livestock and other wildlife have to find substitute forage.

Alternative F (Preferred Alternative)

In spite of the appearance of loss of vegetation, some prairie dog town presence is within a natural range of variability on the larger landscape and would meet Standards for Rangeland Health. Actions to prevent prairie dog towns from adversely impacting other resources or Standards for Rangeland Health should mitigate the potential for prairie dog towns to become a serious negative impact. There would be a simplification of the vegetation community and a likely shift to earlier successional stages on prairie dog towns.

Vegetation

Alternative A (Current Management)

Current conditions would remain unchanged.

Alternatives B and C

Conversion of non-native vegetation communities to native communities would increase the diversity of plant species and restore a more natural vegetation character to the landscape. Depending on the method and implementation, species richness could increase several fold from pre-treatment monocultures. Productivity may increase slightly (likely less than 50%) because a variety of species have different growth requirements and the vegetation community can take advantage of variations in weather. Overall, this conversion could occur on less than 2,000 acres (including seeded pastures and previous reclamation projects that used non-natives). On the scale of the Monument this change in vegetation would not be measurable; however, on specific sites the change could be notable.

Resource reserve allotments would provide the opportunity to adjust use from other areas in the Monument and allow for grazing rest and recovery in other areas. This has the potential to provide flexibility in management of livestock grazing and improve the overall health and productivity of vegetation in the Monument.

Reclamation to native plant species would reduce the amount of bare ground and improve the diversity of vegetation. Allowing natural reclamation would be in the interest of vegetation on small scales where invasive species are not an issue. Reclamation would be required for gas well activity (less than 300 acres); road construction activity (less than 500 acres); and non-functional water development (less than 500 acres).

Alternative D

The impacts would be similar to Alternatives B and C, except for the amount of land (about 2,000 acres) restored to native vegetation. The increase in acreage where natives would be re-established would not be significant on the scale of the Monument.

Resource reserve allotments would provide the opportunity to adjust use from other areas in the Monument and allow for grazing rest and recovery in other areas. This would provide flexibility in management of livestock grazing while improving the health and productivity of vegetation in the Monument.

Reclaiming native plants would reduce the amount of bare ground and improve the vegetation diversity. Allowing natural reclamation would be in the interest of vegetation on small scales where invasive species are not an issue. Reclamation would be required for gas well activity (less than 300 acres); road construction activity (less than 500 acres); and non-functional water development (less than 500 acres).

Alternative E

The impacts would be similar to Alternatives B and C, except for the difference in the acreage (about 2,000 acres) that would be restored to native vegetation. The increase in acreage where native plants would be re-established would not be significant on the scale of the Monument.

Foregoing the opportunity for resource reserve allotments would not have a direct effect on vegetation; however, it would forego the benefits of having the flexibility in management or an opportunity to improve vegetation on other BLM lands.

Reclaiming native plants would reduce bare ground and improve the diversity of vegetation and the resistance to invasive species. Allowing natural reclamation would be in the interest of vegetation on small scales where invasive species are not an issue. Reclamation would be required for gas well activity (less than 300 acres); road construction activity (less than 500 acres); and non-functional water development (less than 500 acres).

Alternative F (Preferred Alternative)

Emphasizing native perennial vegetation in riparian and upland areas would move vegetation communities toward meeting Standards for Rangeland Health. Limiting the use of non-native plants to special circumstances would not substantially detract from native vegetation communities and may protect native plants and/or facilitate recovery of native vegetation in other areas.

The Hay Coulee allotment would be designated a resource reserve allotment and would provide flexibility in managing livestock grazing. If other opportunities develop, additional resource reserve allotments could be established. Resource reserve allotments could create a favorable im-

pact on vegetation by providing opportunities to relieve pressure on other areas where conditions might not be favorable for vegetation, such as recovering from wildland fires or prescribed burning, recovery from reclamation efforts, revision of a grazing strategy, or drought circumstances.

Reclaiming non-functional reservoirs, pits and water developments could favor vegetation if the existing situation is conspicuously unnatural. If natural reclamation is occurring, creating a new disturbance with the intention of improving vegetation may actually be counterproductive to vegetation in the short term in that established plants could be destroyed, and more bare ground could be vulnerable to erosion and invasion of less desirable plants and it would take longer to recover. This concern could be mitigated in case-by-case circumstances.

Range Improvements

Alternative A (Current Management)

There would be no impacts beyond those analyzed in the watershed/activity plans listed in Chapter 3.

Alternatives B, C, D, and E

Depending on the specific goal of a water development project, impacts of the improvement could vary. If health of the land is a goal, the project could be combined with another action (such as refining a grazing strategy to adjust the grazing pattern, season or duration of use) and the combination of these actions would influence vegetation. The benefits would be allowing rest and recovery of plants or reduction of use levels in some areas. However, if a water development provides livestock water and no refined grazing strategy is implemented, it is likely that vegetation could be overused in the area of the new development because plants could be grazed too frequently and heavily and vigor could be suppressed. Fences would conform to a specification that would effectively control livestock while minimizing the risk to wildlife and scenic character. An inadequate fence that would not control livestock does not contribute to maintaining vegetation health because livestock would be grazing in areas intended for rest or regrowth.

Alternative F (Preferred Alternative)

Fences installed or adjusted as part of management strategies to improve vegetation and rangeland health would improve livestock management and reduce grazing impacts, which would provide for rest/recovery of plants and controlled use levels. Some surface disturbance and impact to vegetation could occur during construction activities. However, these would be short-term impacts and could be mitigated with seasonal limitations and minimal-disturbance construction methods and equipment.

Fences installed solely for administrative purposes that do not consider topography have the potential of creating unnatural circumstances where livestock and/or wildlife could concentrate and abuse vegetation while leaving other areas unused.

Water developments that emphasize meeting Standards for Rangeland Health and other management objectives would improve vegetation composition, structure and productivity. However, if water is developed solely for livestock without concurrent management adjustments to control use in the area of the development, there would be some potential for abuse of vegetation and/or shifting of use by livestock and wildlife to other areas.

Forest Products

Alternatives A (Current Management), B, C, and D

Some removal of forest products could occur either by personal use or commercial activities. Impacts on vegetation would vary depending on the product removed and the amount of surface disturbance involved. Christmas tree cutting and incidental fire wood cutting would have notably different impacts to the vegetation than would the harvest of growing trees for lumber. Since wood product resources are limited in the Monument, there is no expectation of frequent or large-scale wood product harvesting activity. Mitigating measures that specify where, how much and by what means wood products are removed would minimize impacts and, in some instances, could be implemented to improve vegetation health.

Alternative E

Not allowing wood product harvesting could lead to some fuel buildup in localized areas and a risk of more serious wildland fires. Overall, wood cutting in itself would not have a substantial impact on vegetation.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives A, B, C, and D.

Fire

Alternative A (Current Management)

Wildland fires would be appropriately suppressed considering the natural role of fire. This policy could create a wide range of impacts on vegetation, depending on the circum-

stances of the fire. If a wildland fire burns hot, it could result in nearly a complete loss of vegetation for the current year and redevelopment of new communities in successive years at different successional levels. This circumstance could also establish invasive species. However, if wildland fires burn in patchy or mosaic patterns, they would create localized impacts on vegetation structure and composition on the site, but would not impact overall vegetation composition or productivity on a watershed or landscape scale. Using heavy equipment to scrape out fire lines could destroy vegetation; however, mitigation measures to reclaim the disturbed area should allow for recovery of the vegetation in the long term.

Prescribed fires based on public safety and resources would reduce woody and fine fuels (both living and dead) and could cause a shift in the structure, composition and age class of vegetation, but is not likely to alter the health of vegetation communities as long as the burns are conducted in a manner that avoids weed invasions.

Impacts to vegetation would vary substantially depending on the circumstances and conditions of wildland fire. The impacts of prescribed fires would be analyzed in site-specific NEPA analyses and burn plans for each project.

Alternative B

Wildland fires would be suppressed aggressively using all available methods. If not prudently applied, this policy could jeopardize vegetation by using heavy equipment in suppression activities. Damage to vegetation from heavy equipment could cause long-term impacts to plants and soil and would require reclamation activities to recover original vegetation cover. Because prescribed fires are only proposed for WSAs, there is some potential that wildland fires could be more damaging to vegetation in the short and mid-term (0-10 years).

Prescribed fires would not be allowed in the Wild and Scenic River, North and South Monument FMUs. Burning could be pursed in WSAs for the purpose of public safety and resources. Prescribed fire would not directly impact vegetation. An impact of not allowing prescribed fire could be the buildup of hazardous fuels which could lead to higher risk of more serious wildland fires. Such wildland fires could simplify vegetation structure, composition and production. In addition, since the suppression strategy toward wildland fires in this alternative would allow all available means of suppression, there would be a risk of damage to vegetation from suppression activities.

Aggressive suppression with minimal prescription burning could lead to larger, more damaging wildland fires as well as suppression activities that could impact vegetation structure, composition and productivity. Impacts would be highly variable depending on circumstances and reclamation activities that would follow.

Alternative C

Wildland fires would be suppressed aggressively using all available methods with the exception that within WSAs, appropriate suppression response would consider the natural role of fire. This alternative would create the same impacts as Alternative B in the three FMUs, and for WSAs the impact would be the same as Alternative A.

Prescription burning would be allowed in the Wild and Scenic River FMU. In the other FMUs, burning would be pursued only for the purpose of public safety and resources. The impacts from prescribed fires would be the same as Alternative A.

Alternative D

Wildland fire in the Wild and Scenic FMU would be suppressed aggressively using all available methods and in all other FMUs would be suppressed in consideration of natural role of fire. In the Wild and Scenic FMU, the impacts would the same as for Alternative B. For all other FMUs, the impacts would be the same as Alternative A.

Prescription burning would be pursued in the interest of public safety/resources and in consideration of the natural role of fire. Prescribed fire would alter seral stages of some vegetation communities, including structure and composition on a site basis, but probably not on a watershed or landscape scale. The desired reduction of hazardous fuels may reduce the risk of large serious fires that could substantially alter and simplify the vegetation structure, composition and productivity.

This alternative would allow adaptive management strategies that should mitigate impacts of fire and suppression activity and minimize direct and indirect impacts to vegetation.

Alternative E

Wildland fire would be suppressed in consideration of the natural role of fire and in some identified areas would be allowed to burn within certain parameters. This policy could contribute to notable shifts in vegetation structure, composition and productivity on a site basis, but the impact would probably not be apparent on the scale of the watershed or landscape.

Prescription burning would be pursued for public safety and resource purposes and in consideration of the natural role of fire. The impacts to vegetation would be the same as Alternative D.

Alternative F (Preferred Alternative)

Fire could create a wide range of impacts on vegetation, depending on the circumstance of the fire. If a wildland fire burns hot, it could contribute to the nearly complete loss of vegetation for the current year and redevelopment of new communities in successive years at different successional levels. This circumstance could also contribute to establishing invasive species. However, if wildland fires burn in patchy or mosaic patterns they would create localized impacts on vegetation structure and composition. Such a fire could simplify the community on a site basis, but probably not impact the total vegetation composition or productivity on a watershed or landscape scale.

Suppression activities (including off-road travel and construction of fire breaks) could create the potential for impacting vegetation and soil through trampling, compacting and the scraping off of established plants, creating opportunities for establishment of invasive species. These adverse impacts would be mitigated with reclamation activities following the fire.

Prescribed fires would be pursued in the interest of public safety/resources and in consideration of the natural role of fire. Prescribed fires could alter seral stages of some vegetation communities, including structure and composition on a site basis, but probably not on a watershed or landscape scale. The reduction of hazardous fuels may reduce the risk of large, serious fires that could substantially alter and simplify the vegetation structure, composition and productivity.

Rights-of-Way

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Limiting the disturbance area to existing corridors would minimize new damage to vegetation. As with any disturbance activity, there would be some risk of invasive species establishment.

Wild and Scenic Rivers

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

There would be no differences in impacts to vegetation, provided vegetation management tools remain available to control invasive/noxious weeds and manage fire fuel.

Impacts to Vegetation – Native Plants from Visitor Use, Services and Infrastructure

Alternative A (Current Management)

Large groups would create the potential for trampling vegetation and creating short-term vegetation impacts in the localized area. There would probably be no long-term impacts if the activity is infrequent, of short duration and does not involve surface disturbance.

Expanding groups of campers would create the potential for jeopardizing vegetation in localized areas around camps. The impact would be a trampling of vegetation and soil, causing a shift in vegetation to more invasive species that can survive trampling and compacted soils. The total area being jeopardized would be small, but the area damage would be in high visibility locations and cumulatively may appear as if substantial areas are being damaged.

Camping Facilities - Dispersed camping (Level 4) would create the potential for leading to higher use areas and could lead to localized vegetation being damaged in popular areas. Trampling vegetation and compacting soils could lead to the decreased health of plants and their replacement by less desirable vegetation. On a localized level, the impact would be small (<1 acre) and the total impact area at current use levels probably would not exceed 100 acres.

Campfires could lead to the localized loss of vegetation and an increased risk of wildland fires where campfires are built on vegetation, although the individual campfire location would be quite small (<1 sq. yard).

Alternative B

Large groups would create the short-term potential for trampling vegetation in the localized area, but probably would not create long-term impacts if the activity is infrequent, of short duration and does not involve surface disturbance.

Providing more Level 1, 2 and 3 sites would jeopardize vegetation at those localized sites, but may curtail damage to vegetation at alternative use areas.

Camping Facilities - Providing more Level 1, 2 and 3 sites would jeopardize vegetation at those localized sites. It could also mitigate damage to vegetation at alternative use areas, assuming use is adjusted to developed areas.

Campfires could lead to the localized loss of vegetation and an increased risk of wildland fires where campfires are built on vegetation, although the individual campfire location would be quite small (<1 sq. yard).

Alternative C

Large groups would create the short-term potential for trampling out vegetation in the localized area, but would not create long-term impacts if the activity is infrequent, of short duration and does not involve surface disturbance.

Not restricting camping on islands would create a potential for jeopardizing vegetation on the island, in that vegetation may be trampled hard enough and repeatedly enough it may not mature annually or successionally. Resistance to invasive species could decline.

Camping Facilities – The impacts would be similar to those in Alternative B plus the potential of jeopardizing vegetation in recreational stock handling sites. Vegetation trampling, soil compaction and the potential for introducing non-native plants through hay and feeds would be possible at these sites. However, since recreational stock would be confined to the site, the end result may be less than if stock is handled at dispersed areas by makeshift means.

Requiring camp stoves, fire pans or fire mats would curtail damage to vegetation and reduce the risk of wildland fires.

Alternatives D and E

Large groups would create the potential for trampling vegetation, which would be a short-term impact in the localized area. It is not likely this would create long-term impacts if the activity is infrequent, of short duration and does not involve surface disturbance.

Providing more Level 1, 2 and 3 sites would jeopardize vegetation at those localized sites, but may curtail damage to vegetation at alternative use areas.

Camping Facilities - With fewer Level 1 and 2 sites, overuse in Level 3 and 4 sites could jeopardize vegetation and Standards for Rangeland Health in those sites. The acreage would not likely be extensive, but would be concentrated in easily accessible areas.

Requiring camp stoves, fire pans or fire mats would curtail damage to vegetation and reduce the risk of wildland fires.

Alternative F (Preferred Alternative)

Large groups would create the potential for trampling vegetation, which would be a short-term impact in the localized area. It is not likely this would create long-term impacts if the activity is infrequent, of short duration, and does not involve surface disturbance.

Trampled vegetation and soil could alter vegetation cover, composition and structure in campsites. These circumstances could also lead to establishing invasive species. Depending on the amount of use occurring at campsites, vegetation recovery from year to year may not be possible. Fire rings at campsites would scar soils and damage vegetation at the campfire site and trampling would occur around the campfire. These impacts would be localized and though notable at camp sites, on the overall scale of the landscape, would be minor.

Mitigating measures that determine when action would be taken to protect the site integrity should protect vegetation.

Camping Facilities - Level 1 and 2 sites would be developed to endure heavy recreational use, and maintaining the native plant community may not be a priority. The actual acres of native vegetation lost would be small (likely <2 acres) at each developed area. Though vegetation would be lost, these areas would sustain use that might otherwise be more damaging to vegetation outside of the developed site.

Requiring camp stoves, fire pans or fire mats would curtail damage to vegetation and reduce the risk of wildland fires.

Impacts to Vegetation – Native Plants from Natural Gas Exploration and Development

Alternative A (Current Management)

Seismic – Techniques that involve surface use (roads/off-road travel/blasting, etc.) could trample, consume or otherwise damage vegetation for the short term, but long-term impacts would not be measurable.

Drilling Operations – Well sites would impact vegetation during installation and operation. As spacing requirements are reduced (more sites per section) more acres of vegetation are impacted. Drilling operations and roads would impact vegetation by crushing plants and disturbing the surface. These would be short-term impacts, but could become long-term if reclamation measures are not enforced or if road and trails use is not limited. Gas well sites and service activities would impact vegetation for the life of the well. However, this loss of vegetation on the scale of the Monument would not be substantial, other than being a potential source for invasive species establishment or expansion. Less than 40 acres of vegetation would be impacted.

Not requiring low impact drilling could lead to surface disturbance and short-term disruption of vegetation communities. However, there would still be less than 40 acres disturbance with conventional operating procedures in the Monument.

Production Facilities and Equipment – Surface disturbance during installation of pipelines would impact vegetation by crushing plants and compacting soil. The short-term

impacts would be evident; however, long-term impacts would be negligible. This impact could be mitigated with appropriate reclamation requirements.

Alternative B

Seismic – Techniques that involve surface use (roads/off-road travel/blasting, etc.) could trample, consume or otherwise damage vegetation in the short term, but long-term impacts would not be measurable.

Drilling Operations – Well sites would impact vegetation during installation and operation. As spacing requirements are reduced (more sites per section) more acres of vegetation would be impacted. Drilling operations and roads would impact vegetation by crushing plants and disturbing the surface. These would be short-term impacts, but could become long term if reclamation measures are not enforced or if road and trail use is not limited. Gas well sites and service activities would impact vegetation for the life of the well, but this loss of vegetation on the scale of the Monument would not be substantial, other than being a potential source for invasive species establishment or expansion. Less than 40 acres of vegetation would be impacted.

Requiring low impact drilling methods would minimize impacts to vegetation. Drilling operations impact vegetation, but minimizing the footprint of the activity and enforcing reclamation standards would make the overall impact on vegetation inconsequential.

Production Facilities and Equipment – Surface disturbance during installation of pipelines would impact vegetation by crushing plants and compacting soil. The short-term impacts would be evident; however, long-term impacts would be negligible. This impact could be mitigated with appropriate reclamation requirements.

Alternatives C and D

Seismic – No impact to vegetation would be anticipated since activities would be limited to existing roads and no blasting would be allowed.

Drilling Operations – Well sites would impact vegetation during installation and operation. As spacing requirements are reduced (more sites per section) more acres of vegetation would be impacted. Drilling operations and roads would impact vegetation by crushing plants and disturbing the surface. These would be short-term impacts, but could become long-term if reclamation measures are not enforced or if road and trail use would not be limited. Gas well sites and service activities would impact vegetation for the life of the well, but this loss of vegetation on the scale of the Monument would not be substantial, other than being a potential source for invasive species establishment or expansion. Less than 40 acres of vegetation would be impacted.

Requiring low impact drilling methods would minimize impacts to vegetation. Drilling operations impact vegetation, but minimizing the footprint of the activity and enforcing reclamation standards would make the overall impact on vegetation inconsequential.

Production Facilities and Equipment – Restricting pipelines to areas of existing disturbance (roads and existing pipelines) would minimize new impacts to vegetation. This impact could be mitigated with appropriate reclamation requirements.

Alternative E

Seismic – No impact to vegetation would be anticipated since activities would be limited to existing roads and no blasting would be allowed.

Drilling Operations – Reducing the number of wells approved per section would decrease the impact on vegetation at well sites and access routes to well sites. The total impacts would be inconsequential on the scale of the Monument.

Requiring low impact drilling methods would minimize impacts to vegetation. Drilling operations impact vegetation, but minimizing the footprint of the activity and enforcing reclamation standards would make the overall impact on vegetation inconsequential.

Production Facilities and Equipment – Restricting pipelines to areas of existing disturbance (roads and existing pipelines) would minimize new impacts to vegetation. This impact could be mitigated with appropriate reclamation requirements.

Alternative F (Preferred Alternative)

Seismic – Techniques that involve surface use (roads/off-road travel/blasting, etc.) could trample, consume or otherwise damage vegetation in the short term, but long-term impacts would not be measurable.

Drilling Operations – Drilling operations and roads would impact vegetation by crushing plants and disturbing the surface. These would be short-term impacts, but could become long-term if reclamation measures are not enforced or if road and trail use is not limited. Gas well sites and service activities would impact vegetation for the life of the well, but this loss of vegetation on the scale of the Monument would not be substantial, other than being a potential source for invasive species establishment or expansion.

Requiring low impact drilling methods would minimize impacts to vegetation. Drilling operations impact vegetation, but minimizing the footprint of the activity and enforcing reclamation standards would make the overall impact on vegetation inconsequential.

Production Facilities and Equipment – Restricting pipelines to areas of existing disturbance (roads and existing pipelines) areas would minimize new impacts to vegetation. This impact could be mitigated with appropriate reclamation requirements.

Impacts to Vegetation – Native Plants from Access and Transportation

Access

Alternatives A (Current Management) and B

Leaving new roads open to public use would increase the loss of vegetation on the road. The total impact area would be estimated at less than 10 acres.

Alternatives C and D

Limiting public use of resource roads accessing gas facilities would minimize damage to vegetation.

Alternative E

Not allowing public use of new resource roads to gas facilities would minimize damage to vegetation.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives C and D.

BLM Road System

Alternative A (Current Management)

The vegetation in the wheel tracks of roads that were not specifically constructed but are tracks worn by use (resource roads) would be damaged by trampling or soil compaction to the point that plants could not grow. Between the tracks, vegetation would be limited in height since vehicle undercarriages would break off the top growth.

Vegetation would be removed for the width of constructed roads (collector and local). In some construction circumstances, vegetation along the edge of a road could be more productive since water would run off the road and be available for plant growth. The degree of impact varies substantially, depending on frequency of use and conditions under which the roads would be used and maintained. Use during wet weather conditions could lead to rutting and tearing plants out. Also during wet weather, alternative routes next to the intended road could develop, further jeopardizing vegetation.

Vegetation on existing resource roads is not currently developing to potential where vehicle tracks trample plants and compact soils (1 mile of road 14 feet wide equals 1.7 acres). Currently, 457 miles of open resource roads translates into about 775 acres of vegetation impacted by roads. The resource roads that would be seasonally or permanently closed should have some opportunity to recover.

Road Classification and Maintenance – Maintenance activity on roads would disrupt vegetation that might otherwise grow in or next to roads. The extent of this impact would depend upon maintenance methods and circumstances.

Exceptions – Vehicle travel off road and on closed resource roads for administrative use would create the potential for trampling vegetation and compacting soil. The extent of this impact would depend upon the frequency and circumstances of use.

Not allowing recreationists to pull off roads to establish camp sites would reduce impacts to vegetation.

Alternative B

Leaving resource roads open would create the potential for jeopardizing vegetation in the track of the road.

New roads would increase the loss of vegetation. However, a new road in a better location than an old road could reduce impacts to vegetation and soils.

Road Classification and Maintenance – In this alternative, 395 miles of the current resource roads (545 miles) would remain open and there would be no change on approximately 670 acres of vegetation occupied by these roads. For those resource roads that are permanently or seasonally closed, vegetation would have the opportunity to recover on approximately 250 acres.

Exceptions – Vehicle travel off road and on closed resource roads for administrative use would create the potential for trampling vegetation and compacting soil. The extent of the impact would depend upon the frequency and circumstances of use.

Allowing pull off and camping up to 300 feet from a road would create the potential for impacting vegetation if this driving would create new tracks. This could produce noticeable impacts in conspicuous areas along regularly used roads; however, the total impacted area would be less than 100 acres.

Alternative C

Leaving resource roads open would create the potential for jeopardizing vegetation in the track of the road.

New roads would increase the loss of vegetation. However, a new road in a better location than an old road could reduce impacts to vegetation and soils.

Road Classification and Maintenance – In this alternative, 358 miles of the current resource roads (545 miles) would remain open and there would be no change on approximately 600 acres of vegetation occupied by these roads. For those resource roads that are permanently or seasonally closed, vegetation would have the opportunity to recover on approximately 300 acres.

Exceptions – Minimized off-road travel for administrative use would reduce impacts to vegetation.

Allowing pull off and camping up to 150 feet from a road would create the potential for impacting vegetation if this driving would create new tracks. This could produce noticeable impacts in conspicuous areas along regularly use roads; however, the total impacted area would be less than 50 acres.

Alternative D

Leaving resource roads open would create the potential for jeopardizing vegetation on the track of the road.

Reducing the number and miles of open roads and parallel/redundant roads would be a positive impact on vegetation, to the extent the roads revegetated.

Road Classification and Maintenance – In this alternative, 238 miles of the current resource roads (545 miles) would remain open and there would be no change on approximately 400 acres of vegetation occupied by these roads. For those resource roads that are permanently or seasonally closed, vegetation would have the opportunity to recover on approximately 520 acres.

Exceptions – Curtailing administrative use on closed roads and off-road would allow vegetation to remain intact and/or redevelop on previously used tracks.

Allowing pull off and camping up to 10 feet from a road would reduce the potential for vegetation impacts.

Alternative E

Leaving resource roads open would create the potential for jeopardizing vegetation on the track of the road.

Reducing the number and miles of open roads and parallel/redundant roads would be a positive impact on vegetation, to the extent the roads revegetated.

Road Classification and Maintenance – In this alternative, 52 miles of the current resource roads (545 miles) would remain open and there would be no change on approximately 90 acres of vegetation occupied by these roads. For those resource roads that are permanently or seasonally closed, vegetation would have the opportunity to recover on approximately 800 acres.

Exceptions – Curtailing administrative use on closed roads and off-road would allow vegetation to remain intact and/or redevelop on previously used tracks.

Not allowing pull off camp sites would reduce vegetation impacts.

Alternative F (Preferred Alternative)

On roads that were not specifically constructed, vegetation would be damaged in the wheel tracks by trampling or soil compaction. Vegetation would be limited in height since vehicle undercarriages would break off the top growth between tracks.

On constructed roads, vegetation would be removed for the width of the construction. In some construction circumstances, vegetation along the edge of a road could be more productive since water would run off the road and be available for plant growth. The degree of impact would vary substantially, depending on frequency of use and the conditions under which the roads are used and maintained. Use during wet weather can lead to rutting and tearing plants out. Also, during wet weather alternative routes next to the intended road can develop and further jeopardize vegetation.

Road Classification and Maintenance – In this alternative, 146 miles of the current resource roads (545 miles) would remain open and there would be no change on approximately 250 acres of vegetation occupied by these roads. For the remaining resource roads that would be closed or seasonally restricted, approximately 650 acres would have some opportunity to recover. Where practical, allowing roads to reclaim naturally would favor native vegetation communities provided invasive species do not become established. Where natural reclamation is not possible, site preparation and seeding would create short-term vegetative damage. However, long-term natural vegetation communities should develop.

Exceptions – Vehicle travel off road and on closed resource roads for administrative use would create the potential for trampling vegetation and compacting soil. The extent of

this impact would depend upon the frequency and circumstances of use.

Allowing pull off and camping up to 300 feet from a road would create the potential for impacting vegetation if this driving develops new tracks. This would probably create noticeable impacts in conspicuous areas along regularly used roads; however, the total impacted area would be less than 100 acres.

Aviation

Alternative A (Current Management)

There would be no new vegetative impacts from the existing airstrips.

Alternative B

Maintenance work could impact vegetation on the 10 landing strips. If done with equipment, it would create more vegetative and soil disruption than if done by hand. Each airstrip occupies 1.5-2 acres; therefore, impacts would occur on less than 20 acres.

Alternative C

Maintenance work could impact vegetation on the seven landing strips. If done with equipment, it would create more vegetative and soil disruption than if done by hand. Each airstrip occupies 1.5-2 acres; therefore, impacts would occur on less than 14 acres.

Alternative D

Maintenance work could impact vegetation on the six landing strips. If done with equipment, it would create more vegetative and soil disruption than if done by hand. Each airstrip occupies 1.5-2 acres; therefore, impacts would occur on less than 12 acres.

Alternative E

Airstrips would be allowed to revegetate naturally and there would be no additional impacts to vegetation.

Alternative F (Preferred Alternative)

Maintenance work could impact vegetation on the six landing strips. If done with equipment, it would create more vegetative and soil disruption than if done by hand. Each airstrip occupies 1.5-2 acres; therefore, impacts would occur on less than 12 acres.

Summary of Cumulative Impacts to Vegetation – Native Plants

After basic site characteristics (soils, exposure topography, etc.), weather, livestock grazing, wildlife use and fire (prescribed and wildland) would be the primary influences on vegetation. These influences have already been addressed in previous plans and would be common to all alternatives. Livestock grazing is controlled through terms and conditions incorporated in grazing permits/leases, including requirements to meet Standards for Rangeland Health. These terms and conditions were established through the development of watershed and/or other activity plans. If resource management goals and objectives are not being met as indicated through monitoring efforts, grazing authorizations would be adjusted to ensure vegetation is not jeopardized.

Alternative A (Current Management)

Localized vegetation disturbances would occur as a function of gas production activity, roads and recreation activities. These activities would likely impact less than 1,000 acres (in terms of total vegetation removal or damage to the health of plants).

Alternative B

Conversion of some non-native vegetation communities to native could occur. Mitigation measures would be adequate to ensure the impacts to vegetation are minimal (less than 1,000 acres).

Alternatives C and D

Specific actions to manage sage-grouse habitat by conserving native vegetation communities would facilitate restoration in some native communities, albeit small in acreage.

Alternative E

Minimizing roads and natural gas surface-disturbing activities would create minimum impacts to vegetation. Allowing prairie dogs to expand without controls could jeopardize vegetation in the localized area of the prairie dog town and could force livestock use into areas that previously have been lightly grazed.

Alternative F (Preferred Alternative)

Localized vegetation disturbances would occur as a function of gas production activity, roads and recreation activities. These activities would likely impact less than 1,000 acres (in terms of total vegetation removal or damage to the health of vegetation).

Conversion of some non-native vegetation communities to native could occur. Mitigation measures would be adequate to ensure the impacts to vegetation are minimal (less than 1,000 acres).

Specific actions to favor sage-grouse by conserving native vegetation communities would facilitate restoration of some native communities, albeit small in acreage.

Minimizing off-road and administrative travel and other surface-disturbing activities would create minor impacts to vegetation, which should recover in a season or two.

Vegetation - Riparian

Impacts to Vegetation – Riparian Common to All Alternatives

Each alternative is directed toward protecting the objects for which the Monument was designated. Riparian habitat is one of those objects. All of the alternatives would have an overall benefit to riparian vegetation. However, the greatest positive impact to riparian vegetation would occur from implementing the management prescriptions contained in the watershed/activity plans carried forward in this Draft RMP/EIS (Table 2.2). These watershed/activity plans would impact all riparian areas in all allotments within the Monument. The allotments meeting Standards for Rangeland Health would see no change in their current management. Those not meeting standards would follow management prescriptions toward meeting the standards. Implementing and enforcing standards and guidelines would enhance riparian habitat, reduce erosion/sedimentation, slow runoff, increase sedimentation on banks and floodplains, and increase bank storage in riparian areas.

Regardless of which alternative is selected, the BLM will comply with all applicable laws and regulations concerning riparian resources. Mitigating measures for resource protection would be applied to all authorized actions.

Impacts to Vegetation – Riparian from Health of the Land and Fire

Alternatives A (Current Management), B, and C

The BLM, at its discretion, would restore or establish native riparian vegetation in areas considered to have the potential to support this vegetation. Examples would include planting shrubs under existing, mature cottonwood stands, or planting cottonwoods and willows on newly developed point bars. This practice could introduce plants not native to the area if the plants are not identified before planting. Also, planted areas never achieve a natural appearance regardless of the steps taken.

Alternatives D and E

The BLM would plant only native riparian species at Level 1, 2 or 3 sites. This practice could introduce non-native species if care is not taken to identify each plant before placement. Limiting planting activities to campgrounds would preserve the natural appearance of those areas outside of campgrounds that establish on their own.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives A, B, and C.

Impacts to Vegetation – Riparian from Visitor Use, Services and Infrastructure

Alternative A

Opportunities for Boaters – The number of people floating the river or camping in riparian areas would not be limited. The riparian areas in and closely adjacent to campsites would continue to be degraded by trampling, firewood gathering and harvesting woody vegetation.

Camping Facilities – This alternative would allow the development of additional Level 1, 2, or 3 sites. Additional damage to riparian areas from increased floater/camper use would spread to areas outside existing campsites.

Alternatives B and C

Opportunities for Boaters – The number of people floating the river or camping in riparian areas would not be limited. Under Alternatives C and F standards and indicators would be used as a means of reducing impacts including closing campgrounds. However, closing some campsites without limiting the number of floaters only shifts the use to other campsites. The riparian areas in and closely adjacent to campsites would continue to be degraded by trampling, firewood gathering, and harvesting woody vegetation.

Camping Facilities – If the number of floaters on the Missouri River continues to increase, impacts to riparian resources would continue to increase. Past management practices such as upstream dam operations and continual hot season grazing over the last 70 years have resulted in a severe loss of two age classes (saplings and poles) of cottonwoods, willows, green ash, and box elder from riparian areas, especially along the Missouri River. The lack of replacement trees means floaters and campers in the near future will have to rely on artificial shelters for shade for an extended period of time (30 to 40 years). Also, the understory of shrubs, forbs and grasses underneath mature cottonwood stands has been severely altered from the natural succession (Kudray, et al, 2004). These alternatives would

allow for developing additional Level 1, 2, or 3 sites where needed to address increasing use demands and would offer the most potential for camper/floater impacts to be confined to specific sites, rather than spread among numerous riparian areas.

Alternative D

Opportunities for Boaters – The number of floaters and campers in the White Cliffs area could be limited if the standards and indicators are exceeded. The remaining campsites would close if standards and indicators are exceeded, but the floaters/campers would have the option to use other campsites not yet exceeding standards and indicators. The impacts would shift from one campsite to another.

Camping Facilities – This alternative would allow the development of additional Level 2 sites in the recreational sections of the Missouri River. It would not allow the development of new Level 1 sites.

Alternative E

Opportunities for Boaters – Limiting the number of floaters/campers per year would offer the greatest protection to riparian vegetation of any of the alternatives, if the floater/camper numbers were reduced to a pre-1997 level.

Camping Facilities – This alternative would not allow the development of additional Level 1, 2, or 3 sites. Additional damage to riparian areas from increased floater/camper use would spread to areas outside existing campsites.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives B and C.

Impacts to Vegetation – Riparian from Natural Gas Exploration and Development

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

The BLM would create streamside management zones for oil and gas operations in all the alternatives. Existing laws and regulations that currently protect riparian resources would continue to be enforced. While the acres affected by riparian oil and gas lease stipulations or conditions of approval varies by alternative, the impacts to riparian resources would be similar for all alternatives. Overall, the impacts would be negligible.

Impacts to Vegetation – Riparian from Access and Transportation

Alternative A (Current Management)

Leaving existing roads open would continue to negatively impact riparian resources at crossings and where roads closely parallel stream channels. The fact that the roads already exist means the impacts prevent riparian regeneration rather than degrading existing vegetation.

Alternatives B, C, D, E, and F (Preferred Alternative)

The closure of roads in riparian areas would allow the regeneration of riparian vegetation in the disturbed areas.

Summary of Cumulative Impacts to Vegetation - Riparian

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

The construction and operation of dams on the Missouri River has a dramatic impact on the flow regime of the river and has reduced the regeneration of woody riparian species, especially cottonwoods and willows (Hansen, 1989, Scott and Auble, 1998, Scott and Auble, 2002). Livestock grazing has also impacted riparian regeneration, but can be partially mitigated by the management prescriptions contained in the Decisions Common to All Alternatives section of Chapter 2. The impacts to riparian regeneration from dams and livestock grazing would persist in both the short and long terms. Campers would continue to degrade riparian resources in small, localized areas at campsites. This degradation would persist into the long term. Planting native species in campgrounds would eventually result in more overstory species like cottonwood and green ash. Understory species, especially native shrubs and grasses, would continue to decline due to human impacts. Once the shrub understory has been eliminated, an understory dominated by introduced herbaceous species persists. The prospect of the site returning to a natural shrub-dominated understory is lost.

Vegetation – Noxious and Invasive Plants

Impacts to Vegetation – Noxious and Invasive Plants Common to All Alternatives

Air Quality

Mitigation measures are already in place to address wind movement of sprayed herbicides for noxious and invasive

plant control. These mitigation measures are derived from state law, local management plans and the herbicide label. Temporary degradation to air quality may occur in the instance where prescribed fire is used as a management tool for invasive and noxious plants.

Cultural Resources

Cultural resources have little impact to noxious and invasive plants. However, should a significant cultural site be discovered, travel to the site and the associated disturbance may bring new noxious and invasive plants into the Monument and/or serve to move these plants to new locations within the Monument. These infestations may then threaten the cultural resource or certain plant populations of importance.

Fish and Wildlife

By managing and improving forage quality and quantity through wildlife and livestock management, the potential introduction and spread of noxious or invasive plants would be reduced by minimizing disturbance and available safe sites for undesirable plant establishment.

Vegetation – Noxious and Invasive Plants

By continuing to use the Guidelines for Integrated Weed Management (BLM 2001b), populations of noxious and invasive plants would be contained to the area along the Missouri River where natural processes of flooding and ice jamming would continue to spread and move these plants along the river. Noxious and invasive plant infestations throughout the Monument would be aggressively treated using integrated weed management principles. Cooperative management efforts would also impact infestations by allowing the BLM to work with other affected interests in addressing entire infestations without administrative boundaries.

Recreation

Noxious and invasive plants would be impacted by most recreational activities in the Monument. The movement of people, their pets and equipment would always present the potential for introduction and spread of these plants. This would be unavoidable, but ways to reduce the risk are addressed in the Guidelines for Integrated Weed Management (BLM 2001b).

Fire

Any fire (prescribed or wildland) would provide a window of opportunity for noxious and invasive plants and other undesired plant species and communities to colonize and dominate the area affected by the fire. In some cases this cannot be avoided due to the invasive plant materials and site-specific conditions present in a given area. Fire could be used as a pre-treatment on invasive and noxious plant species to open up decadent material and allow the treatment to better target new growth.

Impacts to Vegetation – Noxious and Invasive Plants from Health of the Land and Fire

Alternative A (Current Management)

Protecting riparian habitat would help areas resist invasion from unwanted invasive and noxious plants. As existing habitat continues to age without replenishment, invasion of noxious plants is inevitable.

Natural reclamation would eventually occur on disturbed sites, but the plant species that fill in the disturbance may not be natural to the area. In some instances, invasive and noxious plants may be present and a significant component of the disturbed area if left unchecked. In many instances, however, there is no seed source and natural reclamation would be feasible and the most cost-effective method, as long as other issues such as erosion are mitigated.

Alternatives B and C

Long-term restoration and protection of riparian habitat would help riparian systems resist invasion from unwanted invasive and noxious plants. Restoration practices may actually increase risk of invasion and potentially impact the short-term outcome of the restoration. Riparian areas are a common introduction site, but healthy systems would deter colonization and establishment of new invasions.

Resource reserve allotments could help reduce unwanted impacts due to drought, misuse and range improvement projects which would allow invasive and noxious plants to colonize.

Any restoration practices would be mitigated and monitored for the introduction of invasive and noxious weeds as most treatments required by the restoration process would create some disturbance.

Any rehabilitation, with or without a non-native plant component, would need to ensure that noxious and invasive plants are not a component or contaminant in the seed being used.

Natural reclamation would eventually occur on disturbed sites, but the plant species that fill in the disturbance may not be natural to the area. In some instances, invasive and noxious plants may be present and a significant component of the disturbed area if left unchecked. In many instances, however, there is no seed source and natural reclamation

would be feasible and the most cost-effective method, as long as other issues such as erosion are mitigated.

The use of non-native vegetation would pose some risk to the environment as all non-native species have a genetic potential to become invasive at some point after establishment.

When used in restoration, any given non-native species would have the potential to dominate other planted and present vegetation.

Non-native species may be effectively used to prepare sites for reintroduction of late seral grasses and forbs given the right conditions.

Alternative D

Long-term restoration and protection of riparian habitat would help riparian systems resist invasion from unwanted invasive and noxious plants. Restoration practices may actually increase risk of invasion and potentially affect the short-term outcome of the restoration. Riparian areas are common introduction sites, but healthy systems would deter colonization and establishment of new invasions.

Resource reserve allotments could help reduce unwanted impacts due to drought, misuse and range improvement projects which would allow invasive and noxious plants to colonize.

Any restoration practices would be mitigated and monitored for the introduction of invasive and noxious weeds as most treatments required by the restoration process would create some disturbance.

Any rehabilitation with or without a non-native plant component would need to ensure that noxious and invasive plants are not a component or contaminant in the seed being used.

This alternative sets goals for full restoration of a functioning system as close to the pre-disturbance conditions as possible. This may not be realistic goal in some areas and treatments used to meet this goal may actually introduce invasive and noxious weeds into an area.

The use of non-native vegetation would pose some risk to the environment as all non-native species have a genetic potential to become invasive at some point after establishment.

When used in restoration, any given non-native species would have the potential to dominate other planted and present vegetation.

Non-native species may be effectively used to prepare sites for reintroduction of late seral grasses and forbs given the right conditions.

Alternative E

Protecting riparian habitat would help areas resist invasion from unwanted invasive and noxious plants. As existing habitat continues to age without replenishment, invasion of noxious plants is inevitable.

This alternative sets goals for full restoration of a functioning system as close to the pre-disturbance conditions as possible. This may not be realistic goal in some areas and treatments used to meet this goal may actually introduce invasive and noxious weeds into an area.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives B and C.

Impacts to Vegetation – Noxious and Invasive Plants from Visitor Use, Services and Infrastructure

Upper Missouri River SRMA

Alternatives A (Current Management) and B

Recreation User Fees – Any additional resources provided by the return of recreational use fees for invasive and noxious plant management would increase the BLM's ability to meet program goals.

Opportunities for Boaters – The larger the group, the more potential there would be for increased disturbance and the introduction of undesired plant seed from outside the Monument, and from site to site within the Monument.

Motorized Watercraft – These alternatives would provide the necessary access to infestations to comply with the management prescribed by the 2001 Guidelines for Integrated Weed Management developed for the Monument.

Alternative C

Recreation User Fees – Any additional resources provided by the return of recreational use fees for invasive and noxious plant management would increase the BLM's ability to meet program goals.

Opportunities for Boaters – The larger the group, the more potential there would be for increased disturbance and the introduction of undesired plant seed from outside the Monument, and from site to site within the Monument.

Motorized Watercraft – Upstream travel would be necessary to complete the objectives of the 2001 Guidelines for Integrated Weed Management development for the Monument. Herbicide applications, biological control activity, and other treatment types require certain weather and environmental conditions to be effectively implemented. By limiting the available days for upstream travel in the wild and scenic segments from June 15 to September 15, this alternative could significantly reduce what could be done in available windows of opportunity when managing invasive and noxious plants along 89 miles of the Missouri River. Scientists have estimated that for each year an infestation is not managed after the initial treatment, the infestation gains, on average, the growth and expansion equivalent to 3 years of non-treatment. Given this information, this alternative would not allow for the proper management of invasive and noxious plants and the BLM would not meet the goals set forth in the weed management plan or meet expectations from county governments, the Montana Department of Agriculture, and private landowners.

Alternative D

Recreation User Fees – Any additional resources provided by the return of recreational use fees for invasive and noxious plant management would increase the BLM's ability to meet program goals.

Opportunities for Boaters – The larger the group, the more potential there would be for increased disturbance and the introduction of undesired plant seed from outside the Monument, and from site to site within the Monument.

Motorized Watercraft – Upstream travel would be necessary to complete the objectives of the 2001 Guidelines for Integrated Weed Management development for the Monument. Herbicide applications, biological control activity, and other treatment types require certain weather and environmental conditions to be effectively implemented. By limiting administrative travel to downstream only during the seasonal restriction, this alternative could significantly reduce what could be done in available windows of opportunity when managing invasive and noxious plants along 89 miles of the Missouri River. Scientists have estimated that for each year an infestation is not managed after the initial treatment, the infestation gains, on average, the growth and expansion equivalent to 3 years of non-treatment. Given this information, this alternative would not allow for the proper management of invasive and noxious plants and the BLM would not meet the goals set forth in the weed management plan or meet expectations from county governments, the Montana Department of Agriculture, and private landowners.

Alternative E

Recreation User Fees – There would be no additional resources provided by the return of recreational use fees for invasive and noxious plant management.

Opportunities for Boaters – The larger the group, the more potential there would be for increased disturbance and the introduction of undesired plant seed from outside the Monument, and from site to site within the Monument.

Motorized Watercraft – Upstream travel would be necessary to complete the objectives of the 2001 Guidelines for Integrated Weed Management development for the Monument. Herbicide applications, biological control activity, and other treatment types would require certain weather and environmental conditions to be effectively implemented. This alternative would significantly reduce what could be done in available windows of opportunity when managing invasive and noxious plants along 149 miles of the Missouri River. Scientists have estimated that for each year an infestation is not managed after the initial treatment, the infestation gains, on average, the growth and expansion equivalent to 3 years of non-treatment. Given this information, these alternatives would not allow for the proper management of invasive and noxious plants and the BLM would not meet the goals set forth in the weed management plan or meet expectations from county governments, the Montana Department of Agriculture, and private landowners.

Alternative F (Preferred Alternative)

The impacts would be similar to Alternatives A and B if uniform procedures for administrative travel do not preclude upstream travel during available windows of opportunity.

Impacts to Vegetation – Noxious and Invasive Plants from Natural Gas Exploration and Development

Alternative A (Current Management)

Seismic – Many seismic operations could cause soil disturbance and allow the introduction and colonization of invasive and noxious plants.

Drilling Operations – Standard operating procedures would allow sufficient disturbance for undesired vegetation, invasive and noxious plants to colonize a well site. Reclamation would be more difficult with this alternative.

Roads are known pathways for the immigration and emigration of invasive and noxious plants. By not restricting administrative use roads to that purpose, the risk of new

invasions of undesirable plant species would be greater as the potential source for undesired species would become regional rather than local.

Alternative B

Seismic – Many seismic operations could cause soil disturbance which would allow the introduction and colonization of invasive and noxious plants.

Drilling Operations – Low impact drilling would lessen the amount of disturbance on a site, however, equipment may be contaminated with weed seed which needs very little disturbance to start a new infestation.

Roads are known pathways for the immigration and emigration of invasive and noxious plants. By not restricting administrative use roads to that purpose, the risk of new invasions of undesirable plant species would be greater as the potential source for undesired species would become regional rather than local.

Alternatives C, D, and E

Seismic – The main disturbance-causing seismic activities would be limited, which would reduce the potential introduction and spread of invasive and noxious plants.

Drilling Operations – Low impact drilling would lessen the amount of disturbance on a site, however, equipment may be contaminated with weed seeds which need very little disturbance to start a new infestation.

The minimal vehicle needed for the job would still pose some risk of invasive and noxious plant introduction. The reduced traffic and lighter vehicles would, in most cases, decrease the potential disturbance for invasive plant material to occupy.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives C, D, and E.

Impacts to Vegetation – Noxious and Invasive Plants from Access and Transportation

Access

Alternative A (Current Management)

New resource roads for natural gas operations would be open to the risk of invasive plants being brought in not only by companies, but also by the general public.

Alternatives B, C, D, E, and F (Preferred Alternative)

Limiting or restricting the use of new resource roads for natural gas operations or road segments may reduce the potential introduction of invasive plants.

BLM Road System

Alternative A (Current Management)

Road System Criteria – By not closing a resource road, at least temporarily, should a highly invasive plant be detected would increase the plant's ability to move along the road system and eventually spread to impact other resources.

Road Classification and Maintenance – Allowing roads to reclaim naturally may encourage noxious and invasive weeds. If an invasive or undesired plant community is already along a closed road, the probability of one or more of these species claiming the road would be increased.

Alternative B

A limited number of open roads would decrease the range of potential spread to the open roads.

Road System Criteria – By not closing a resource road, at least temporarily, should a highly invasive plant be detected would increase the plant's ability to move along the road system and eventually move out to impact other resources.

Road Classification and Maintenance – Allowing roads to reclaim naturally may encourage noxious and invasive weeds. If an invasive or undesired plant community is already along a closed road, the probability of one or more of these species claiming the road would be increased.

Alternative C

A limited number of open roads would decrease the range of potential spread to the open roads.

Road System Criteria – Allowing temporary closure and/or reroutes in highly infested areas would help contain potential threats posed by invasive and/or noxious plants. Closing certain portions of roads may not be practical and would need to be considered on a site-specific basis.

Given the current conditions in the Monument (having very few infestations near roads), permanent road closures would only be necessary should a highly invasive, high priority weed be detected in abundance.

Road Classification and Maintenance – Allowing roads to reclaim naturally may encourage noxious and invasive weeds. If an invasive or undesired plant community is

already along a closed road, the probability of one or more of these species claiming the road would be increased.

Alternatives D and E

A limited number of open roads would decrease the range of potential spread to the open roads.

Road System Criteria – Allowing temporary closure and/or reroutes in highly infested areas would help contain potential threats posed by invasive and/or noxious plants. Closing certain portions of roads may not be practical and would need to be considered on a site-specific basis. Given the current conditions in the Monument (having very few infestations near roads), permanent road closures would only be necessary should a highly invasive, high priority weed be detected in abundance.

Road Classification and Maintenance – These alternatives would actively deter the establishment of invasive and noxious plants.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternative C.

Summary of Cumulative Impacts to Vegetation – Noxious and Invasive Plants

Alternatives A (Current Management) and B

The management of invasive and noxious plants would continue as prescribed by the 2001 Guidelines for Integrated Weed Management. Invasive and noxious plants would continue to be treated aggressively using integrated management principles as resources allow. This should result in a significant decline in the amount and distribution of invasive and noxious plant populations in the next 10 to 20 years.

Other activities and resource uses would continue the risk of introducing and moving invasive and noxious plant material to and within the Monument. These activities are unavoidable, but the risk could be reduced through proper mitigation and education of public land users. New introductions, when found, would be aggressively managed according to the management plan.

Alternatives C, D, and E

The risk of new introductions of invasive and noxious plants and movement within the Monument would be mitigated to the extent possible. Other than natural causes such as wildlife, flooding, and ice scour, invasive species would have limited opportunity to colonize. These alternatives would not allow the proper management of invasive and noxious plants along the Missouri River and the BLM would not meet its goals set forth in the weed management plan.

These alternatives decrease the risk of new introductions of invasive and noxious plants, but limit the management practices needed to continue aggressive treatment of infestations not accessible by land. These infestations could be allowed to grow unchecked and would provide a perpetual seed bank for those species to continue to colonize within the Monument.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives A and B.

Visual Resources

Impacts to Visual Resources from Health of the Land and Fire

Visual Resource Management (VRM)

Alternative A (Current Management)

VRM Class I – No change as 16% of the Monument remains under the constraints of the strictest visual category (preservation of current landscape values). For the 61,700 VRM Class I (preservation of the existing visual character of the Monument landscape), any surface-disturbing activities plus semi-permanent and permanent facilities would require special design including location, painting, and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives of preserving the existing visual character of the Monument landscape (Table 4.14).

VRM Class II, III, and IV – No change as 84% of the Monument remains under the protection of these other three categories. For any of the 313,300 acres of BLM land under VRM Class II (retention of the existing visual character of the Monument landscape), VRM Class III (partial retention of the existing visual character of the Monument landscape), and VRM Class IV (modification of the existing visual character of the Monument landscape), surface-disturbing activities plus semi-permanent and permanent facilities may require special design including location, painting, and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives.

Table 4.14
Visual Resource Management Class Designations (acres)

VRM Class	*Alternative A (Current Management)*	*Alternative B*	*Alternative C*	*Alternative D*	*Alternative E*	*Alternative F (Preferred Alternative)*
Class I	61,700	111,480	111,480	111,480	111,480	111,480
Class II	118,800	44,520	161,560	263,520	263,520	161,560
Class III	8,200	105,000	101,960	0	0	24,770
Class IV	186,300	114,000	0	0	0	77,190

Alternative B

Under this alternative, the effect would be a greater amount of BLM land (30%) under the constraints of the most restrictive component for the protection of the scenic landscape values. The VRM Class II acreage drops 20%, the Class III acreage increases 26%, and the Class IV landscape category decreases 30% (Table 4.14).

There would be the possibility of modification to the existing visual landscape on Class III & IV lands, which would account for 58% of the Monument.

VRM Class I – To comply with BLM policy for visual resources in the six WSAs, there would be a 14 % increase for VRM Class I acreage under Alternative B. The 111,480 acres which accounts for 30% of Monument includes the WSAs, the wild segments of the UMNWSR, and the Bodmer landscape sites along the Missouri River. Any surface-disturbing activities plus semi-permanent and permanent facilities may require special design including location, painting, and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives.

VRM Class II - There would be a decrease of 74,280 acres in the VRM Class II category.

VRM Class III and IV – For any of the 219,000 acres under these two VRM classes surface-disturbing activities plus semi-permanent and permanent facilities may require special design including location, painting, and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives.

Alternative C

The VRM Class IV land in the uplands would be designated at higher levels of protection for the visual landscape values (Table 4.14). Under this alternative, there would be no BLM land under VRM Class IV. Acreage would increase in VRM Class I to 30% and in VRM Class II to 43%. The subsequent increase (11%) in the VRM Class II acreage would provide a potential improvement for the protection of one of the Proclamation's objects. An impact would be additional BLM land in the uplands (25%) that would be designated at higher levels of protection for the visual landscape values (Table 4.14).

VRM Class I – The VRM Class I acreage would increase to 30%. For the 111,480 acres in VRM Class I, the visual contrast from proposed projects would be reduced by utilizing proper site selection; reducing soil and vegetative disturbance; choice of color; and over time, returning the disturbed area to a seamless, natural landscape.

VRM Class II and IIII – The VRM Class II acreage would increase to 43% and VRM Class III would increase to 27%. For the 263,520 acres in VRM Class II and III, surface-disturbing activities plus semi-permanent and permanent facilities may require special design including location, painting, and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives.

Alternative D

Under this alternative, there would be no BLM land under both VRM Class III and Class IV visual management categories. The acres under VRM Class I would increase to 111,480 (30%). Another impact would be an increase in the number of BLM acres (70%) that would require stricter visual resource stipulations to meet the desired standards for VRM Class II.

VRM Class I – Surface-disturbing activities would be prohibited on some of the 111,480 acres of VRM Class I land. An additional 46,480 acres could be off limits to any new development.

VRM Class II – For the 263,520 acres in VRM Class II, the visual contrast from proposed projects would be reduced by utilizing proper site selection; reducing soil and vegetative disturbance; choice of color; and over time, returning the disturbed area to a seamless, natural landscape.

Alternative E

The land with VRM Class III and IV ratings would be designated as VRM Class II (Table 4.14). The VRM Class I acreage would remain the same as under Alternative C, but the VRM Class II acreage would increase by 46%. Any surface-disturbing projects would have to meet stricter visual resource standards.

VRM Class I – Surface-disturbing activities may be prohibited on some of the 111,480 acres of VRM Class I land. An additional 46,480 acres could be off limits to any new development.

VRM Class II – Surface-disturbing activities may be prohibited in some of the VRM Class II areas (263,520 acres). Any of the 375,000 acres in the Monument could be off limits to surface-disturbing activities.

Alternative F (Preferred Alternative)

Under this alternative, there would be an increase (25% or 92,540 acres) in the most restrictive visual management categories (VRM Class I and II). The impact would be that 73% of the Monument (273,040 acres) would be under more stringent visual standards compared to the 48% currently designated under Alternative A.

All four VRM classes would be represented on BLM land but VRM Class III and Class IV designations would be at significant lower acreages (Table 4.14).

Any surface-disturbing projects/proposals located on BLM land would require a visual contrast rating be completed, no matter what the type of VRM class. This type of documentation formally becomes a part of the site specific NEPA analysis.

A total of 111,480 acres (30%) would be designated as VRM Class I, an increase of 14%. The VRM Class II acreage would total 161,560 acres (43%), an increase of 11%. The VRM Class III acreage would total 24,770 acres (7%), which would be an increase of 5%. The VRM Class IV acreage would total 77,190 acres (20%), a 30% decrease from the existing situation.

VRM Class I – A total of 30% of the Monument may not be authorized for surface-disturbing activities.

VRM Class II, III, and IV – The visual contrast on 70% of the Monument would be reduced by utilizing proper site selection; reducing soil and vegetative disturbance; choice of color; and over time, returning the disturbed area to a seamless, natural landscape. Surface-disturbing activities plus semi-permanent and permanent facilities would be allowed if they met these criteria.

Impacts to Visual Resources from Natural Gas Exploration and Development

Alternatives A (Current Management) and B

VRM Class I – For the 1,478 acres of oil and gas leases in VRM Class I (Table 4.15), any surface-disturbing activities plus semi-permanent and permanent facilities may require special design including location, painting, and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives. Based on the RFD, there is the potential for no natural gas wells in VRM Class I under Alternative A and one well under Alternative B.

VRM Class II, III, and IV – For the 41,327 acres of oil and gas leases in VRM Class II, III, and IV (Table 4.15), surface-disturbing activities plus semi-permanent and permanent facilities may require special design including location, painting, and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives. Based on the RFD, there is the potential for 35 natural gas wells in VRM Class II, III and IV under Alternative A (20 wells in VRM Class II and no wells in VRM Class III and 15 wells in Class IV). Under Alternative B there is the potential for 43 wells (23 wells in VRM Class II and no wells in VRM Class III and 20 wells in Class IV).

Table 4.15
Visual Resource Management Classes within the Existing Oil and Gas Leases
Alternatives A (Current Management) and B

	Visual Resource Management Class			
	VRM Class I (acres)	***VRM Class II (acres)***	***VRM Class III (acres)***	***VRM Class IV (acres)***
West HiLine Leases	92	3,789	0	6,447
Non-West HiLine Leases	1,386	16,470	0	14,621
Total	1,478	20,259	0	21,068

Alternative C

VRM Class I – For the 2,936 acres of oil and gas leases in VRM Class I (Table 4.16), the visual contrast would be reduced in the existing characteristic landscape by utilizing proper site selection; reducing soil and vegetative disturbance; choice of color; and over time, returning the disturbed area to a seamless, natural landscape. Based on the RFD, there is the potential for one natural gas well in VRM Class I.

VRM Class II and III – For the 39,869 acres of oil and gas leases in VRM Class II and III (Table 4.16), surface-disturbing activities plus semi-permanent and permanent facilities may require special design including location, painting, and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives. Based on the RFD, there is the potential for 27 natural gas wells these areas (21 wells in VRM Class II and six wells in VRM Class III).

Alternative D

VRM Class I – Surface-disturbing activities may be prohibited on the 2,936 acres of oil and gas leases in VRM Class I (Table 4.17). Based on the RFD, there is the potential for no natural gas wells in VRM Class I.

VRM Class II – For the 39,869 of oil and gas leases in VRM Class II (Table 4.17), the visual contrast would be reduced in the existing characteristic landscape by utilizing proper site selection; reducing soil and vegetative disturbance; choice of color; and over time, returning the disturbed area to a seamless, natural landscape. Based on the RFD, there is the potential for 13 natural gas wells in VRM Class II.

Alternative E

VRM Class I – Surface-disturbing activities may be prohibited on the 2,936 acres of oil and gas leases in VRM Class I (Table 4.17). Based on the RFD, there is the potential for no natural gas wells in VRM Class I.

VRM Class II – For the 39,870 acres of oil and gas leases in VRM Class II (Table 4.17), surface-disturbing activities may be prohibited. Based on the RFD, there is the potential for no natural gas wells in VRM Class II.

Alternative F (Preferred Alternative)

VRM Class I – Surface-disturbing activities may be prohibited on the 2,936 acres of oil and gas leases in VRM Class I (Table 4.18). Based on the RFD, there is the potential for no natural gas wells in VRM Class I.

Table 4.16
Visual Resource Management Classes within the Existing Oil and Gas Leases
Alternative C

	Visual Resource Management Class		
	VRM Class I (acres)	***VRM Class II (acres)***	***VRM Class III (acres)***
West HiLine Leases	108	7,438	2,783
Non-West HiLine Leases	2,828	25,137	4,512
Total	2,936	32,575	7,294

Table 4.17
Visual Resource Management Classes within the Existing Oil and Gas Leases
Alternatives D and E

	Visual Resource Management Class	
	VRM Class I (acres)	***VRM Class II (acres)***
West HiLine Leases	108	10,220
Non-West HiLine Leases	2,828	29,649
Total	2,936	39,869

VRM Class II, III, and IV – For the 39,869 acres of oil and gas leases in VRM Class II, III, and IV (Table 4.18), the visual contrast would be reduced by utilizing proper site selection; reducing soil and vegetative disturbance; choice of color; and over time, returning the disturbed area to a seamless, natural landscape. Based on the RFD, there is the potential for 34 natural gas wells in VRM Class II, III, and IV areas (24 wells in VRM Class II, three wells in VRM Class III, and seven wells in VRM Class IV).

Summary of Cumulative Impacts to Visual Resources

Alternative A (Current Management)

Overall, there would be the potential for minor visual impacts on 61,700 acres of which 2 % could be related to natural gas activity. Any surface-disturbing activities and placement of facilities within VRM Class I areas would require special design stipulations to meet the visual preservation objectives in addition to the standard criteria.

Visual impacts could occur on potentially 313,300 acres of which 13% could be related to natural gas activity.

Alternative B

There would be the potential for minor visual impacts on 111,480 acres of which 1 % could be related to natural gas activity. Any surface-disturbing activities and placement of facilities within VRM Class I areas would require special design stipulations to meet the visual preservation objectives in addition to the standard criteria.

Visual impacts could occur on potentially 263,520 acres of which 16% could be related to natural gas activity.

Alternative C

For this alternative, there would be the potential for minor visual impacts on 111,480 acres of which 3% could be related to natural gas activity. Any surface-disturbing activities and placement of facilities within VRM Class I areas would require special design stipulations to meet the visual preservation objectives in addition to the standard criteria.

Visual impacts could occur on potentially 263,520 acres of which 15 % could be related to natural gas activity.

Under this alternative, there is an overall shift to stricter visual requirements to meet the objectives of preservation, retention, and partial retention of the existing visual character of the Monument landscape. The modification Class IV criteria are no longer applicable for 50% of the BLM land.

Alternative D

The visual impacts would be similar Alternative C.

This alternative would represent a greater shift yet to stricter visual requirements for surface-disturbing activities and the placement of facilities. Any impacts to the visual resource must meet the preservation and retention objectives of the existing visual character of the Monument landscape. The lesser stringent partial retention VRM Class III and modification VRM Class IV criteria are no longer applicable for 52% of the BLM land.

Alternative E

The visual impacts would be similar Alternative C.

This alternative would be the most restrictive for surface-disturbing activities and placement of facilities to meet visual standards for the Monument. A surface-disturbing activity or the placement of a facility on any of the 375,000 acres of BLM land may be prohibited or denied if it fails to meet the visual objectives of VRM Class I or II.

Alternative F (Preferred Alternative)

For this alternative, there would be the potential for none or minor visual impacts on 111,480 acres of BLM land, which

Table 4.18
Visual Resource Management Classes within the Existing Oil and Gas Leases
Alternative F (Preferred Alternative)

	Visual Resource Management Class			
	VRM Class I (acres)	***VRM Class II (acres)***	***VRM Class III (acres)***	***VRM Class IV (acres)***
West HiLine Leases	108	7,438	1,565	1,218
Non-West HiLine Leases	2,828	25,139	2,520	1,990
Total	2,936	32,577	4,085	3,208

3% could be related to natural gas activity. Any surface-disturbing activities and placement of facilities within VRM Class I areas would require special design stipulations to meet the visual preservation objectives in addition to the standard criteria.

Under VRM Class II acreage (161,560 acres) there would be the potential for minor visual impacts of which 20% could be attributed to natural gas activity.

For the 24,770 acres under VRM Class III, there could be visual impacts with 16% of that acreage potentially attributed to natural gas activity.

The remaining 77,190 acres of BLM land with a VRM Class IV category may have visual impacts including the 4 % associated with natural gas activities.

The four VRM classes would be represented, but at different percentages than currently exist. A majority of the Monument (73%) would be designated as VRM Class I or Class II. This would represent a 25% increase in the acreage meeting the intent of the visual quality objectives.

Water

Impacts to Water Common to All Alternatives

All the allotments in the Monument have been assessed for compliance with the rangeland standards and guidelines through watershed plans. Those allotments not meeting standards have had management prescriptions written that will allow them to meet or make significant progress toward meeting standards. The majority of these prescriptions have been implemented. The remainder will be implemented in the near future as funding allows.

None of the alternatives discussed in this document would have a measurable impact on ground water, water rights, or listed water quality impaired streams.

Impacts to Water from Health of the Land and Fire

Both natural and prescribed fires impact water resources. The bare ground following a fire increases erosion and sedimentation, degrades water quality and decreases infiltration and ground water recharge. These impacts would be temporary, lasting 2-4 years until the burned areas revegetate.

Alternatives A (Current Management) and B

Aggressive suppression and minimal prescribed fires could lead to excessive fuel build-up and potentially large, catastrophic fires, which have the potential to create greater impacts to water resources than the other alternatives.

Alternative C

Prescribed fires to reduce the potential of large, catastrophic fires would produce fewer impacts to water resources than Alternatives A and B.

Alternatives D and E

The propose fire management in these alternatives would result in fewer impacts to water resources than the other alternatives.

Managing Monument lands to sustain or improve wildlife habitat would result in increased ground cover from plants and litter, with better plant diversity and density. This serves to improve water resources as plants tend to trap sediment, increase infiltration and ground water recharge, and improve water quality. Both alternatives would result in a positive benefit to water resources.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives D and E.

Impacts to Water from Visitor Use, Services and Infrastructure

Human wastes entering the Missouri River from overland flow across dispersed campsites could result in degraded water quality. The degradation is slight and probably not measurable with the current level of visitor use. As the level of visitor use increases, the magnitude of the impact increases. Improved infrastructure (more toilet facilities) and the portable toilet requirement would reverse this trend.

Alternative A (Current Management)

No additional facilities would be proposed to meet increased visitor use. If visitor use increases, the magnitude of degraded water quality would be greatest in this alternative.

Alternatives B and C

Increased facilities would be allowed throughout the UMNWSR if funding is available. Potentially, either of these alternatives would offer the greatest protection to water quality of the six alternatives.

Alternative D

Increased infrastructure would be allowed only in certain segments of the Missouri River. It would provide more protection to water quality than Alternatives A and E, although it would be difficult to measure the magnitude of this protection.

Alternative E

The impacts would be the same as Alternative A.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives B and C.

Impacts to Water from Natural Gas Exploration and Development

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Developing existing leases would be subject to standard operating procedures and BMPs which minimize surface disturbance. The quantity of increased erosion and sedimentation from oil and gas activities would be similar among all the alternatives. The differences between alternatives concerning disposal water and seismic operations would be so slight it would not be measurable.

No additional leases would be allowed in the Monument. The infrastructure already exists for most of the current leases. Any additional impacts from oil and gas activities would be the same for all alternatives.

Impacts to Water from Access and Transportation

Alternatives A (Current Management) and B

Additional roads in the Monument may increase erosion/sedimentation and degrade water quality. The increase in degradation would depend on the amount of new roads constructed. Overall, the increase in sediment from new roads would not be measurable considering the erosive nature of the soils throughout the Missouri River Breaks.

Alternatives C, D, and E

Restricting vehicular access in sensitive areas would result in less erosion and sedimentation compared to Alternatives A and B.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives C, D, and E.

Summary of Cumulative Impacts to Water

Alternatives A (Current Management) and B

These alternatives could create the potential for large, catastrophic fires; making them the least attractive for protecting water resources. The impacts, if these fires occur, could degrade water quality, infiltration and ground water recharge for the short term.

Alternatives C, D, and E

These alternatives would result in a gradual improvement in watershed conditions in the long term.

Implementation of the completed watershed plans would have both short and long-term positive impacts to water resources.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives C, D, and E.

Forest Resources

Impacts to Forest Resources from Forest Products

Alternative A (Current Management)

In recent years, most forest product sales have been personal use incidental products (firewood, Christmas trees, post and poles, etc.). Very few sawlog sales have occurred and most have been minor quantities less than 3,000 board feet (a log truck full of wood is about 4,500 board feet).

Under current management, the immediate impacts would be occasional stumps which may negatively impact aesthetics, although the quantities sold would not result in an entire hillside full of stumps. There may be scattered slash and residue. Some off-road trails and ruts may occur; however, all permits would be written with the stipulations that vehicles are to stay on authorized roads and trails. Along with bare mineral soil being disturbed comes the potential for weeds and other invasive plants.

The minimal amount of forest products being sold would not affect the likelihood of improving overall forest health. Because activities like Christmas tree gathering often result in taking the prettiest tree (which in all likelihood is the

genetically superior tree), the best trees could be high-graded from among this size class of timber.

Some lost revenues may result from not aggressively pursuing opportunities that arise on neighboring ownerships, which could sometimes lead to poorly designed transportation and skidding systems if these opportunities on adjoining lands are not pursued.

Alternatives B and C

Waiting for opportunities to conduct minor sales may or may not coincide with opportunities that arise on adjoining lands. Forest health issues typically are throughout a watershed or drainage and are larger than specific treatment areas. The BLM would need to treat for forest health on a large scale.

Designating specific areas for incidental uses such as firewood, Christmas trees, etc. would limit negative impacts to specific areas. Concentrated use such as Christmas tree cutting or firewood gathering could result in intensive overuse in a relatively small area; however, this would be easier to monitor for negative impacts because it would be confined to a small area.

Alternative D

The impacts would probably be similar to Alternatives B and C, except there may be no need to wait for opportunities on adjoining land.

Alternative E

There would be no impacts directly related to harvest. However, there would be lost opportunities to treat forested land and sell products in conjunction with neighboring activities and there would be at least some lost revenue. There would be no opportunity to treat for forest health if even on a small project level scale. As adjoining properties sell forest products, the chance exists to create an unnatural straight-edge effect where cutting occurs up to BLM but not beyond. Intentional and/or unintentional trespass may occur, resulting in increased workloads to resolve.

Alternative F (Preferred Alternative)

Forest management impacts would be short term if project planning is done properly, and should create an overall positive benefit to resources. Bare mineral soil exposure due to skidding products, burning slash piles, etc. leave a short-term scar on the landscape such as bare soil exposure, ash and smoke residue. In the short term, harvesting material would create fewer impacts on the landscape than a catastrophic, stand-replacing wildland fire.

Summary of Cumulative Impacts to Forest Resources

Alternatives A (Current Management), B, C, and D

The cumulative impacts would be very similar for all of these alternatives. Forest products sales would be incidental and so scattered that they would be relatively insignificant, unless associated with a much larger project adjoining another ownership.

Alternative E

No cumulative impacts would be expected, except that no treatment would increase the possibility of a stand-replacing event such as wildland fire. The cumulative impacts of such an event could be devastating; depending on the timing of other natural events that may follow (heavy rains following a catastrophic wildland fire would result in significant soil erosion and may lead to negative downstream cumulative impacts).

Alternative F (Preferred Alternative)

The impacts would be similar as Alternatives A, B, C, and D.

Lands and Realty

Impacts to Lands and Realty Common to All Alternatives

Continuing to grant rights-of-way within the Monument, provided impacts can be mitigated, would ensure state and private landowners access to their lands and would allow continued access for transportation and utility needs. However, the need to protect the objects for which the Monument was designated may result in delays and more expense incurred by the right-of-way applicant.

The ability to pursue land exchanges could result in an improved land pattern leading to more efficient management of the Monument. The State of Montana owns over 39,000 acres of land intermingled with the Monument; management of the state land is based on different goals and policies than those of the BLM. Therefore, the ability to consolidate these parcels with existing BLM land would enhance the BLM's ability to manage resources to further enhance and protect those values for which the Monument was designated. The same holds true for private land intermingled with the Monument.

Impacts to Lands and Realty from Health of the Land and Fire

Rights-of-Way

Alternative A (Current Management)

The seven corridors designated in the West HiLine RMP would maintain their current width where they cross the Missouri River. Also, the Klabzuba pipeline would be restricted to the width of the pipeline right-of-way (35 to 50 feet).

Right-of-way (ROW) applicants would be encouraged to locate their ROWs within the designated corridors or outside avoidance areas. Applicants would be restricted from locating ROWs in exclusion areas.

Alternatives B, C, D, and E

The eight designated utility and transportation corridors would have defined boundaries where they cross the Monument and would be restricted to within 1/2 mile of the centerline of the following roads/rights-of-way: State Secondary Highway #236; Lloyd/Stafford Ferry road; Klabzuba pipeline; DY Trail (Power Plant Ferry road); and U.S. Highway 191. The remaining three designated corridors at Fort Benton, Loma and Virgelle only apply to the Missouri River. The acreage within each of the defined boundaries is listed below:

State Highway #236	1,744
Lloyd/Stafford Ferry Road	4,783
Klabzuba Pipeline	3,198
DY Trail (Power Plant Ferry Road)	11,279
U.S. Highway 191	214

Right-of-way applicants would be encouraged to locate their ROWs within the designated corridors or outside avoidance areas. Applicants would be restricted from locating within exclusion areas, which cause surface disturbance or impact the visual resources.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives B, C, D, and E.

Land Ownership Adjustment

Alternatives A (Current Management) B, C, D, and E

No lands would be identified for disposal and there would be no impact.

Alternative F (Preferred Alternative)

Eighty acres of BLM land on the edge of the Monument, some of which is suitable for farming, would be disposed of to a private landowner in exchange for 71.12 acres of privately owned river frontage which could be used as a primitive campsite. The BLM land contains none of the objects for which the Monument was designated and has been a source of conflicts of use. The private land contains riparian areas, cottonwoods and suitable camping areas.

Wild and Scenic Rivers

Alternatives A (Current Management), B, C, and D

If the streams are not recommended as suitable, there would be no impact. Cow Creek and/or Dog Creek are included under other designations including the Upper Missouri National Wild and Scenic River, Upper Missouri River Breaks National Monument, Lewis and Clark National Historic Trail, and the Nez Perce National Historic Trail (Cow Creek). Eagle Creek is also within three of these current designations, but additionally, it does not cross BLM land within those designations.

Alternative E

If Cow Creek, Dog Creek or Eagle Creek are recommended as suitable, there would be no additional impacts to lands and realty.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives A, B, C, and D.

Impacts to Lands and Realty from Natural Gas Exploration and Development

Alternative A (Current Management)

Rights-of-way may need to be relocated to avoid slopes over 30%, or over 20% if they contain extremely erosive or slumping soils.

Alternative B

Right-of-way construction or installation may be delayed and less cost effective when located on slopes exceeding 30%.

Alternatives C and D

Right-of-way construction or installation may be delayed and less cost effective when located on slopes exceeding

30% or slopes exceeding 20% which contain extremely erosive or slumping soils. Roads may be prohibited on slopes of 40% or greater.

Alternative E

Roads would be prohibited on slopes of 20% or greater.

Alternative F (Preferred Alternative)

Right-of-way construction or installation may be delayed and less cost effective when located on slopes exceeding 30% or slopes exceeding 20% which contain extremely erosive or slumping soils.

Roads more than 300 feet in length would be prohibited on slopes of 40% or greater.

Summary of Cumulative Impacts to Lands and Realty

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Right-of-way installation or construction may be delayed and may be more expensive in order to avoid or mitigate impacts to sensitive areas or habitat.

Livestock Grazing

Impacts to Livestock Grazing Common to All Alternatives

Fish and Wildlife

Grazing permit holders that have allotments in bighorn sheep habitat within the Monument would not have the option to change the class of livestock to domestic sheep. Currently, there are few requests to change permits from cattle to sheep so this impact would not likely impact many grazing permit/lease holders.

This RMP/EIS does not commit additional forage to be allocated to wildlife at the expense of livestock, nor does it specifically call for reductions to accommodate existing wildlife populations. However, if monitoring information indicates that Standards for Rangeland Health are not being met and the forage being allocated to livestock is the cause of not meeting standards, adjustments in allocated forage could be made through the watershed planning process. Under anticipated future conditions, this is expected to be relatively minor and would only occur in localized areas that are critical to wildlife.

Fencing reservoirs could potentially limit water availability for livestock in some cases. However, this action could be mitigated by piping water away from reservoirs to a stock water tank.

Actions to improve the quality and quantity of nesting, brood rearing and winter habitat for upland game birds may limit the amount of livestock use that can occur in an area. This could mean a reduction in the AUMs available and the livestock production capacity in a localized area; however, most of this adjustment could be mitigated by adjusting seasons of use or the duration of grazing.

Soils

In some cases, the location of proposed range improvements may have to be changed to areas with lower erosion potential. Although this may create an inconvenience, it would also be beneficial to livestock permit/lease holders as it would likely lengthen the life expectancy of range improvements and result in fewer long-term impacts such as accelerated erosion, sedimentation, surface disturbance during maintenance, noxious weed outbreaks and deterioration of rangeland health.

Vegetation – Native Plants

Adjustments in grazing authorizations to meet Standards for Rangeland Health may cause some inconvenience or change in the established way of grazing an area, but in the long term, meeting Standards for Rangeland Health should stabilize the AUMs available for livestock.

Vegetation – Riparian

Riparian-wetland objectives would be met at current stocking levels with adjustments that have been implemented as part of the incorporation of Standard for Rangeland Health and implementation of Guidelines for Livestock grazing in recent watershed and other activity plans. Reductions in AUMs to meet riparian-wetland objectives would not likely occur. Riparian management would be emphasized through continuing monitoring and the adaptive management process. This emphasis has shifted some grazing use to uplands. This trend would continue and, in general, less hot season grazing would occur in riparian areas. The need to minimize livestock use of riparian areas would increase management requirements for the grazing permittee. Permittees on approximately 20 allotments would need to spend a few days every grazing season keeping up fences, water developments, or moving livestock to meet riparian community management goals.

Vegetation – Noxious Weeds

Continued control of noxious weeds would benefit grazing by decreasing the costs associated with widespread inva-

sions of noxious weeds (lost forage and escalating weed treatment costs).

Water

The reserve water right (as established through the Proclamation) for Arrow Creek and the Judith River carries a priority date of 2001. The reserve water right has little potential to impact ranchers with existing water rights because most of these water rights were established between the 1880s through the mid-1950s. Ranchers and farmers within the Judith River and Arrow Creek drainage basin who request water rights in the future could be impacted as they could be denied a water right on private land. Approval of proposals to build new improvements such as reservoirs on BLM land in these basins would be more difficult and in most cases these proposals would be denied.

Livestock Grazing

Livestock grazing would continue according to direction in the Proclamation. There would be no change to the process that is currently used to plan grazing. Watershed plans would continue to be used for site-specific planning and to achieve Standards for Rangeland Health and implement Guidelines for Livestock Grazing Management.

Standards for Rangeland Health

Meeting Standards for Rangeland Health would continue to be a goal of management and will be monitored regularly. Guidelines for Livestock Grazing Management would continue to be implemented and refined through an adaptive management process as resource conditions change. These livestock grazing guidelines have been implemented through the watershed planning process and no additional impacts would occur as a result of the decision in this RMP/EIS.

Recreation

Recreational activities would have the potential to disrupt livestock grazing and management of grazing by displacement of livestock and occasional loss of forage. However, current levels of use by respectful and prudent recreationists have not had serious impacts on livestock grazing and none are anticipated.

Aviation

Landings and takeoffs from backcountry airstrips would have the limited potential to disturb livestock. However, the time of disturbance is a very short time period (time for landing and taxi and take off). Current and anticipated use of backcountry airstrips is very low (less than 100 landings/takeoffs per year). In addition, since pilots' aircraft and their very lives depend on exceptional diligence to avoid problems with panicked livestock, impact to livestock grazing would be inconsequential.

Impacts to Livestock Grazing from Health of the Land and Fire

Fish and Wildlife - Greater Sage-Grouse

Alternative A (Current Management)

There would be no impacts to livestock grazing.

Alternatives B, C, and D

These alternatives would result in few changes to livestock grazing because most grazing activity occurs outside of the important times for sage-grouse. Allotments near sage-grouse leks would be under more strict utilization limits in order to leave adequate residual cover for sage-grouse in suitable nesting areas. The utilization limits could be accommodated by management actions to distribute livestock away from leks and nesting areas.

Conversion of non-native grasses to native vegetation would cause short-term impacts as these areas would need rest to allow native vegetation to establish. Generally, this rest/establishment period would not allow grazing during the growing season for the first 2 years. The overall impact would likely be less than 0.1% of the total AUMs within the Monument.

If winter habitat is needed for sage-grouse security, season of use adjustments could occur on a site-specific basis and would be limited to sagebrush cover types of vegetation. Predicting the potential loss of AUMs is problematic, but under a worst case scenario would probably be less than 1% of the AUMs available in the Monument, and would mostly be in eight or fewer allotments. The most likely scenario would involve a temporary loss of less than .1% of the total AUMs in the Monument.

The use of prescribed fire could benefit grazing in the long term by increasing the production of herbaceous species. Short-term impacts would consist of a temporary loss of AUMs because of the need to rest burned areas after a fire (usually rest for the growing season during the first 2 years following the fire). The short-term impacts caused by the need for a rest period would be offset by the long-term increase in productivity of range forage.

The limit on utilization could cause a slight adverse impact if a grazing prescription calls for periodic high use or high density grazing. Overall, this impact would be light because high stocking rates, or high density grazing would be limited from March 1 to June 15. This restriction could be partially remedied through the use of various grazing strategies and methods to shift grazing use away from leks.

Alternative E

This alternative would directly impact those permittees with grazing permits/leases for allotments near sage-grouse leks. Livestock grazing in suitable nesting habitat would not occur from March 1 to June 15 and from December 1 to March 31. Eight allotments would be impacted. However, the impacted area would not include the entire allotment. The losses in seasons of use could be a few weeks to a couple months in that portion of the allotment that is sage-grouse habitat. There could be some loss of AUMs of forage if no alternative grazing is available in the allotment. This loss of AUMs would amount to less than 1% of the AUMs in the entire Monument. It could cause some hardship on individual operators and lead to overuse of private land in the same area that is no less important to sage-grouse. Mitigating measures would consist of adjusting which pastures are used and to what level utilization is allowed to minimize the net effect on livestock operations.

Reclamation of non-native grasslands (conversion) back to native plant species would result in a short-term loss of AUMs because these areas would need to be rested during the growing season for 2 years after restoration. However, even this short-term loss of forage would be recovered as the native vegetation becomes established.

Those permittees who rely on non-native grasses on BLM lands for spring/early summer use could be adversely impacted by conversion back to native vegetation, but such impacts would be slight as most ranches have non-native pastures on private land.

The use of prescribed fire would benefit grazing in the long term by increasing the production of herbaceous species. Short-term impacts would consist of loss of AUMs due to the rest period required after a fire. The short-term impacts caused by the need for a rest period would be offset by the long-term increase in productivity of native rangeland forage.

Alternative F (Preferred Alternative)

This alternative would create some inconvenience for livestock operations and limit use in key areas for sage-grouse. This impact would involve parts of eight allotments. Only three of the allotments would have substantial adjustments in grazing practices since the sage-grouse habitat only takes up a small part of the allotment. The impact would probably be more in season of use rather than in AUMs available.

Reclamation of non-native grasslands (conversion) back to native plant communities could result in a short-term loss of AUMs because these areas would need rest during the growing season for 2 years after restoration. However, even this short-term loss of forage would be recovered as the native vegetation becomes established.

Those permittees who rely on tame grasses on BLM lands for spring/early summer use could be adversely impacted by conversion back to native vegetation, but such impacts would be slight as most ranches have non-native pastures on private land.

The use of prescribed fire would benefit grazing in the long term by increasing the production of herbaceous species. Short-term impacts would consist of loss of AUMs due to the rest period required after a fire. The short-term impacts caused by the need for a rest period would be offset by the long-term increase in productivity of native rangeland forage.

Fish and Wildlife - Black-Tailed Prairie Dog Towns

Alternative A (Current Management)

Alternative A would create no impact to livestock grazing, except in limited cases where prairie dog towns would compromise rangeland health standards.

Alternatives B, C, and D

These alternatives would create localized impacts to available forage for livestock in those pastures where the towns exist and could force grazing use into areas that were normally lightly used. Controlling prairie dog towns when they are compromising Standards for Rangeland Health would benefit grazing through increased productivity of forage.

Alternative E

Prairie dog towns would be allowed to expand without any controls and would have the potential to reduce AUMs. This potential is of particular concern on river bottom terraces where the prairie dog town could monopolize an entire bottom, leaving very little forage for livestock. Percentage-wise on the scale of the Monument, this would amount to very little loss; however, in an allotment that depends on river bottoms, it could result in substantial reductions of forage and/or loss of seasons of use.

Alternative F (Preferred Alternative)

There could be localized losses of forage available for livestock from prairie dog towns.

Fish and Wildlife - Mitigation

Alternative A (Current Management)

There would be no impact to livestock grazing from actions to accommodate greater sage-grouse, designated sensitive status species, bald eagles, big game winter range or bighorn sheep lambing areas.

Alternative B

Greater sage-grouse management could create a minor hindrance to livestock grazing because of the requirement to limit surface disturbance to certain time periods. These impacts would occur on a rare basis. Overall, the impacts would be minimal since most limitations to surface disturbance are proposed in early spring and winter, while most surface-disturbing activities are scheduled for summer or fall.

There would be no impacts to livestock grazing from actions to manage designated sensitive status species, bald eagles, big game winter range or bighorn sheep lambing areas.

Alternative C

Greater sage-grouse management could create a minor hindrance to livestock grazing because of the requirement to limit surface disturbance to certain time periods. These impacts would occur on a rare basis. Overall, the impacts would be minimal since most limitations to surface disturbance are proposed in early spring and winter, while most surface-disturbing activities are generally scheduled for summer or fall.

Limiting seasons of operation for surface-disturbing activities to protect designated sensitive species would inconvenience the construction of reservoirs and other maintenance work. With proper planning and advanced scheduling, this impact could be mitigated and would not seriously impact livestock grazing.

In rare instances, the requirement to avoid surface disturbances in the presence of an active bald eagle nest could impact the installation or maintenance of a range improvement. The impact would be minor and could usually be mitigated by placing range improvements in alternative locations.

There would be no impacts to livestock grazing from actions to manage big game winter range or bighorn sheep lambing areas.

Alternative D

Greater sage-grouse management could create a minor hindrance to livestock grazing because of the requirement to limit surface disturbance to certain time periods. These impacts would occur on a rare basis. Overall, the impacts would be minimal since most limitations to surface disturbance are proposed in early spring and winter, while most surface-disturbing activities are generally scheduled for summer or fall.

Limiting seasons of operation for surface-disturbing activities to protect designated sensitive species would inconvenience the construction of reservoirs and other maintenance work. With proper planning and advanced scheduling, this impact could be mitigated and would not seriously impact livestock grazing.

The requirement to avoid an active bald eagle nest could create a minor hindrance to grazing management when a range improvement is needed near a nest or in riparian habitat near a nest. Only one or two allotments could potentially be impacted.

Provisions to accommodate big game winter range management could occasionally limit the construction of a range improvement. Such impacts could usually be mitigated by placing range improvements in alternative locations. Impacts would be minor.

There could be some limits on range improvements near bighorn sheep lambing areas in the future.

Alternative E

Greater sage-grouse management could create a minor hindrance to livestock grazing because of the requirement to limit surface disturbance to certain time periods. These impacts would occur on a rare basis. Overall, the impacts would be minimal since most limitations to surface disturbance are proposed in early spring and winter, while most surface-disturbing activities are generally scheduled for summer or fall.

Limiting seasons of operation for surface-disturbing activities to protect designated sensitive species would inconvenience the construction of reservoirs and other maintenance work. With proper planning and advanced scheduling, this impact could be mitigated and would not seriously impact livestock grazing.

The requirement to avoid an active bald eagle nest could create a minor hindrance to grazing management when a range improvement is needed near a nest or in riparian habitat near a nest. Only one or two allotments could potentially be impacted.

This alternative could occasionally limit the construction of a range improvement in big game winter range. Such impacts could usually be mitigated by placing range improvements in alternative locations. Impacts would be minor.

There could be some limits on range improvements near bighorn sheep lambing areas.

Alternative F (Preferred Alternative)

Greater sage-grouse management could create a minor hindrance to livestock grazing because of the requirement to limit surface disturbance to certain time periods. These impacts would occur on a rare basis. Overall, the impacts would be minimal since most limitations to surface disturbance are proposed in early spring and winter, while most surface-disturbing activities are generally scheduled for summer or fall.

Limiting seasons of operation for surface disturbance activities to protect designated sensitive species would inconvenience construction of reservoirs and other maintenance work. With proper planning and advanced scheduling for work, this impact could be mitigated and would not seriously impact livestock grazing.

Management of active bald eagle nests could create a minor hindrance to grazing management when a range improvement is needed near a nest or in riparian habitat near a nest. Only one or two allotments could potentially be impacted.

This alternative could occasionally limit the construction of range improvement in big game winter range. Such impacts could usually be mitigated by placement of range improvements in alternative locations. Impacts would be minor.

There could be some limits on range improvements near bighorn sheep lambing areas.

Vegetation

Alternative A (Current Management)

There would be no impacts.

Alternatives B and C

Resource reserve allotments would benefit livestock operators by providing forage when allotments are unavailable for grazing due to rangeland conditions (for example, prescribed fires or wildland fires). Creating resource reserve allotments could come about through several means (including relinquishment or cancellation of a permit, land acquisition, etc). In some instances, an individual operator could have a reduction of forage available; however, on the scale of the Monument and the local economy, this loss would not represent a substantial percentage. The BLM would not anticipate creating a great number of resource reserve allotments, but would like to develop the opportunity to allow more flexibility in livestock management. If resource reserve allotments were to be created on a large scale, they would be subject to further planning and environmental review.

The potential for an increased spread and invasion of noxious weeds could result in slight loss to forage base and increased cost of weed treatment in the future.

Alternative D

Resource reserve allotments would benefit livestock operators by providing forage when allotments are unavailable for grazing due to large fires, etc. Creating resource reserve allotments could come about through several means (including relinquishment or cancellation of a permit, land acquisition, etc). In some instances, an individual operator could have a reduction of forage available; however, on the scale of the Monument and the local economy, this loss would not represent a substantial percentage. The BLM would not anticipate creating a great number of resource reserve allotments, but would like to develop the opportunity to allow more flexibility in livestock management. If resource reserve allotments were to be created on a large scale, they would be subject to further planning and environmental review.

Alternative E

Without resource reserve allotments livestock operators may need to reduce AUMs and/or seasons of use, at least in the short term, which would be an adverse impact.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternative D.

Range Improvements

Alternative A (Current Management)

There would be no impacts.

Alternatives B, C, and D

The impacts could include disruption of grazing and the need to revisit grazing plans because pasture configurations and allotment boundaries could change. In some cases, positive benefits may be realized from changes to grazing patterns.

Alternative E

The impacts could include disruption of grazing and the need to revisit grazing plans because pasture configurations and allotment boundaries could change. In some cases positive benefits may be realized from changes to grazing patterns.

There could be some inconvenience to ranchers from restrictions on reservoir placement. Using three-wire fences may not meet the needs of controlling livestock in some

instances and could increase the costs of operation and effectiveness of prescribed grazing treatments. Some water sources that might be in the interest of livestock, but not in the interest of other resource values would be forgone, which could limit livestock use.

Alternative F (Preferred Alternative)

This alternative provides flexibility in the type of fence used and establishes criteria for developing livestock water facilities. There could be a reduction in the construction of livestock water sources, which could limit available forage. However, if grazing prescriptions are well designed and followed, there should be no effective loss in overall forage available.

Visual Resources

Alternatives A (Current Management), B, and C

These alternatives could impose some restrictions on the size and type of range improvements.

Alternatives D and E

These alternatives would cause greater impacts to livestock grazing due to visual classification levels with stricter requirements.

Alternative F (Preferred Alternative)

This alternative could limit some aspects of range improvement development; however, these impacts could be mitigated with design specifications and would effectively be only an inconvenience to livestock grazing facility installation.

Forest Products

Alternative A (Current Management)

There would be no impact.

Alternatives B, C, and D

Improved production of herbaceous understory would benefit grazing slightly.

Alternative E

Encroaching forest vegetation could reduce available forage for livestock grazing. This alternative could create more hazardous fuel buildup and, in turn, increase the risk of wildland fires that could consume forage and cover for both livestock and wildlife.

Alternative F (Preferred Alternative)

The impact would be the same as Alternatives B, C, and D.

Fire

Alternative A (Current Management)

There would be no impact.

Alternative B

There would be some potential for reduced grazing forage due to encroaching forest vegetation and foregoing the opportunity to use prescribed fires. The loss would be slight, but measurable over time.

Alternatives C and D

There would be no impact.

Alternative E

There could be some negative impacts due to an increased risk of large fires. Such fires could lead to substantial short-term losses of forage. This loss of forage could extend into the following years and grazing would have to be adjusted to allow plants to recover.

Alternative F (Preferred Alternative)

There would be no impact.

Wild and Scenic Rivers

Alternatives A (Current Management), B, C, and D

As long as Standards for Rangeland Health are being met, recommendation of a wild and scenic river would not impact grazing. The existing designation of the Upper Missouri National Wild and Scenic River, in itself, has not imposed any substantial need to adjust livestock grazing.

Alternative E

As long as Standards for Rangeland Health are being met, recommendation of a wild and scenic river would not impact grazing. The existing designation of the Upper Missouri National Wild and Scenic River, in itself, has not imposed any substantial need to adjust livestock grazing. Secondary actions of a designation could lead to localized inconvenience to livestock grazing if specific developments would be installed to accommodate recreation or historic preservation.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives A, B, C, and D.

Impacts to Livestock Grazing from Visitor Use, Services and Infrastructure

Recreation

Alternatives A (Current Management), B, C, and D

Large group events could conflict with livestock management and/or disrupt livestock grazing, leading to some short-term losses of forage or season of use.

Alternative E

There would be no impact.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives A, B, C, and D.

Upper Missouri River SRMA

Alternative A (Current Management)

Opportunities for Boaters – Limiting the floater group size to 50 on the Missouri River would not reduce livestock/camper conflicts at campsites. The 14-day campground stay period and lack of an allocation system would allow conflicts to continue.

Camping Facilities – Establishing campsites would create a potential for impacts to livestock grazing; however, these could be mitigated with public information and some controls on seasons of livestock use.

There may be an increase in conflicts between campers and livestock on the Missouri River.

Alternative B

Opportunities for Boaters – The potential for conflicts between campers and livestock would increase due to a lack of an allocation system, no launch restrictions for groups, no floater group size limits, and a 14-day campground stay period. Conflicts would mostly occur during summer and early fall.

Camping Facilities – Establishing campsites would create some potential for impacts to livestock grazing; however, these could be mitigated with public information and some controls on seasons of livestock use.

There may be an increase in conflicts between campers and livestock on the Missouri River.

Alternative C

Opportunities for Boaters – Limiting the floater group size to 20 on the Missouri River and implementing launch limits in addition to a 2-day limit on the length of stay at Level 2 sites during peak periods would reduce livestock/camper conflicts at campsites. Conflicts would mostly occur during summer and early fall.

Camping Facilities – Establishing campsites creates the potential for impacts to livestock grazing; however, these could be mitigated with public information and some controls on seasons of livestock use.

Alternative D

Opportunities for Boaters – If an allocation system is implemented, along with a 2-day campsite stay limit at Level 2 sites during peak periods, potential conflicts between livestock and campers could be reduced. However, conflicts could continue due to large group size limits (30) and no launch restrictions for groups smaller than 30. Conflicts would occur primarily during summer and early fall.

Increasing the number of Level 2 sites based on demand would better disperse camping along the river and limit overall camper/livestock conflicts to some degree.

Camping Facilities – Establishing campsites creates the potential for impacts to livestock grazing; however, these could be mitigated with public information and some controls on seasons of livestock use.

Alternative E

Opportunities for Boaters – Implementing an allocation system, group size limit (16), launch limit, and a 2-day campsite stay limit at Level 2 and 3 sites during peak periods would limit camper/livestock conflicts. This alternative would lessen the potential for conflicts between campers and livestock more than any other alternative.

Camping Facilities – Establishing campsites would create the potential for impacts to livestock grazing; however, these could be mitigated with public information and some controls on seasons of livestock use.

Motorized Watercraft – There could be an adverse impact caused by the inability to transport fencing materials to

riparian exclosures and maintain fences and water facilities. Grazing plans may need to be altered.

Alternative F (Preferred Alternative)

Opportunities for Boaters – The size of groups would be controlled and would curtail some conflicts between livestock and the recreating public. Some conflicts would continue; however, with raising public awareness these conflicts should be minimized.

Camping Facilities – Established campsites could create some potential for impacts to livestock grazing; however, these can be mitigated with public information and some controls on seasons of livestock use.

Uplands SRMA

Alternative A (Current Management)

Motorized tours could impact livestock grazing activities with occasional disruption of livestock and the potential of gates being left open; however, these would be minor and could be mitigated with user education.

Alternatives B and C

Motorized tours could impact livestock grazing activities with occasional disruption of livestock and the potential of gates being left open; however, these would be minor and could be mitigated with user education.

Allowing hunting outfitters access to the entire Monument could concentrate use to a specific area in any given year. Concentrated hunting activity could disrupt livestock operations.

Alternatives D and E

Motorized tours could impact livestock grazing activities with occasional disruption of livestock and the potential of gates being left open; however, these would be minor and could be mitigated with user education.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives D and E.

Impacts to Livestock Grazing from Natural Gas Exploration and Development

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Seismic – The use of explosives in seismographic activities could displace livestock and on rare occasions could be hazardous to livestock. These impacts could be mitigated with stipulations requiring safety zones and respectful attention to other uses occurring in the area.

Drilling Operations – Gas development, and associated activities, could impact livestock forage lost to roads and well sites. This would be a small loss on a short-term basis. These impacts could be mitigated with reclamation standards and operation stipulations that minimize travel, assert leaving fences and range improvements in place, and extend courtesy to the livestock operator.

Impacts to Livestock Grazing from Access and Transportation

BLM Road System

Alternatives A (Current Management), B, and C

Since authorized users have the option to travel off road and on closed roads for administrative purposes there would be no direct impact to livestock grazing.

Road System Criteria – There would be no impact.

Alternative D

Seasonal use provisions for travel off road and on closed roads for administrative purposes could impact the management of livestock grazing.

Road System Criteria – *Vehicles Ways in WSAs* – It could be more difficult for permittees to access range improvements to perform major maintenance work on fences or water projects. This would not create day-to-day impacts since much of the WSAs are rough and dissected and impractical for motorized equipment.

Bighorn Sheep Lambing Areas – The limitation on use of roads may create some difficulty for those few ranchers who need to use roads near lambing areas to repair range improvements and manage livestock before June 15.

Big Game Winter Range – Seasonal closures would occasionally hamper livestock management and access to range improvements. The seasonal closure to May 15 would impact allotments with late spring turnout times. However, maintenance activities that occur in the wintering period are generally fence repairs and turning on water systems, and would not involve using heavy equipment, which normally would occur in the summer or fall.

Designated Sensitive Species – In isolated cases, livestock management and access to range improvements could be hampered. Only a few allotments would be affected.

Bald Eagle – In rare cases, management of livestock and access to range improvements could be limited during the active nesting times. At this time only one or two allotments could be affected.

Alternative E

Requiring permittees to receive permission to use roads on a case-by-case basis would be impractical due to the frequency of use and the need for immediate use to address urgent livestock management needs. It has the potential of delaying timely action which could lead to secondary impacts of abuse of riparian areas, habitat intended for wildlife, recreation sites and/or strained relationships with neighbors and other users of the Monument. Permittees would not be able to receive permission on weekends and holidays and would be unable to properly maintain range improvements and manage livestock.

Road System Criteria – *Vehicles Ways in WSAs* – It would be more difficult for permittees to access range improvements to perform major maintenance work on fences or water projects. This would not create day-to-day management impacts since much of the WSAs are rough and dissected and impractical for motorized equipment.

Greater Sage-Grouse – Accessing range improvements and tending livestock could be hampered.

Bighorn Sheep Lambing Areas – The limitation on use of roads may create some difficulty for those few ranchers who need to use roads near lambing areas to repair range improvements and manage livestock before June 15.

Big Game Winter Range – Seasonal closures would occasionally hamper livestock management and access to range improvements. The seasonal closure to May 15 would impact allotments with late spring turnout times. However, maintenance activities that occur in the wintering period are generally fence repairs and turning on water systems, and would not involve using heavy equipment, which normally would occur in the summer or fall.

Designated Sensitive Species – Livestock management and access to range improvements would be more difficult in some cases. This alternative would create the most difficulty in management of grazing allotments, and could impact a moderate number of allotments, especially those with nesting habitat in the form of large trees and cliffs.

Bald Eagle – In rare cases, livestock management and access to range improvements could be limited during the active nesting times. One or two allotments could be affected.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives A, B, and C.

Summary of Cumulative Impacts to Livestock Grazing

The impacts to livestock grazing have been dealt with in watershed and other activity plans which are incorporated into this RMP/EIS.

Alternative A (Current Management)

There would be no cumulative impacts that have not already been considered in previous planning efforts.

Alternatives B, C, and D

In these alternatives, management of habitat for sage-grouse and other wildlife species could cause some inconvenience to livestock grazing. Recreational activities could cause conflicts between livestock grazing and other uses. Establishment of resource reserve allotments would add flexibility to livestock grazing management.

Alternative E

Management of wildlife habitat could reduce available forage on select allotments. Limitations on travel could make livestock management and range improvements more difficult. Not having resource reserve allotments available would reduce flexibility in grazing activities and could have the impact of short-term reductions that could not be mitigated for an individual operator. Strict limitations on fencing specifications could lead to ineffective control of livestock and, in turn, higher livestock management costs and could also jeopardize vegetation resources. Limiting/restricting water facilities could limit use of some forage that might otherwise be available for livestock.

Alternative F (Preferred Alternative)

The establishment of resource reserve allotments would allow added flexibility in livestock grazing management. Management of wildlife habitat and recreation would have minor, inconvenient impacts to livestock grazing.

Minerals – Oil and Gas

Impacts to Minerals – Oil and Gas from Health of the Land and Fire

Rights-of-Way (ROWs)

Alternative A (Current Management)

Corridors – The Klabzuba pipeline would not be one of the designated corridors crossing the Missouri River.

Avoidance Areas – This alternative may affect the ability to transport natural gas or access 1,440 acres (4%) of four non-West HiLine leases within the Ervin Ridge WSA and 2,331 acres of 5 non-West HiLine leases within the wild and scenic sections of the UMNWSR (one pipeline currently extends into two of the five leases). Riparian areas and areas containing sedimentary Breaks soils would be avoided where possible; however, this alternative would affect the majority of the leased minerals because most of the soils are sedimentary Breaks soils.

Exclusion Areas – The wild section of the UMNWSR would be an exclusion area, which could affect the ability to transport natural gas or access 2,331 acres of 5 non-West HiLine leases (one pipeline currently extends into two of the five leases). The other exclusion areas would not affect the leases.

Alternatives B, C, D, E, and F (Preferred Alternative)

Corridors – The Klabzuba pipeline would be a designated corridor with a defined boundary that includes BLM land within 1/2 mile of the pipeline.

Avoidance Areas – These alternatives may affect the ability to transport natural gas or access 2,331 acres of 5 non-West HiLine leases within the wild and scenic sections of the UMNWSR (one pipeline currently extends into two of the five leases). Riparian areas and areas containing cultural/historic sites, unique geologic formations and sedimentary Breaks soils would be avoided where possible; however, these alternatives would affect the majority of the leased minerals because most of the soils are sedimentary Breaks soils.

Exclusion Areas—The wild section of the UMNWSR would be an exclusion area, which could affect the ability to transport natural gas or access 2,331 acres of 5 non-West HiLine leases (one pipeline currently extends into two of the five leases). These alternatives could also affect 1,440 acres (4%) of 4 non-West HiLine leases within the Ervin Ridge WSA. The other exclusion areas would not affect the leases.

Wild and Scenic Rivers

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

There would be no impact, as there would be no changes to the management of BLM land that would affect oil and gas minerals.

Impacts to Minerals – Oil and Gas from Natural Gas Exploration and Development

Alternative A (Current Management)

Seismic – There would be no impact to the natural gas resource.

Stipulations/Conditions of Approval – The stipulations and conditions of approval would affect a portion of the oil and gas leases in the Monument (Table 4.19).

Greater Sage-Grouse – Currently there are no known leks within 1/4 mile of the West HiLine leases. However, if a 1/4-mile restriction is applied as a condition for the non-West HiLine leases, 31 acres would be affected.

For nesting areas, a timing restriction could affect 1,276 acres of 5 West HiLine leases and if a similar restriction is applied as a condition to the non-West HiLine leases, an additional 4,498 acres would be affected. This timing restriction would preclude activities for 122 days from March 1 to June 30.

For crucial winter habitat, the timing restriction would affect 441 acres of 3 West HiLine leases with a 166 day restriction from December 1 to May 15.

Black-Tailed Prairie Dogs – For the West HiLine leases, surface use may be restricted or excluded within 1/4 mile of special status species. This would affect 72 acres of 1 West HiLine lease.

Designated Sensitive Species – For the West HiLine leases, surface use may be restricted or excluded within 1/4 mile of special status species. This would affect 3 acres (<1%) of 1 West HiLine lease. There are no known raptors nests within 200 meters of the non-West HiLine leases. However, if a 1/4-mile restriction is applied as a condition, an additional 532 acres would be affected (6 non-West HiLine leases).

Bald Eagle – Currently there are no known roosting or nesting sites in or near the existing oil and gas leases within the Monument, and there would be no impact to the natural gas resource.

Big Game Winter Range – For the West HiLine leases, surface use may be restricted or excluded from December 1 to May 15, during severe winters. This timing restriction would affect 6,986 acres (68%) of 9 West HiLine leases in deer and elk winter range and 2,561 acres (25%) of 7 West HiLine leases in antelope crucial winter range. If this timing restriction is applied as a condition to the non-West HiLine leases, an additional 19,137 acres of 18 leases would be affected by deer and elk winter range and 3,588 acres of 9 leases would be affected by antelope crucial winter range. This timing restriction would preclude activities for a period of 166 days.

Bighorn Sheep Distribution – The standard lease terms would apply to 3,080 acres of 4 West HiLine leases and 11,164 acres of 13 non-West HiLine leases.

Bighorn Sheep Lambing areas – The standard lease terms would apply to 1,059 acres of 4 West HiLine leases and 5,504 acres of 11 non-West HiLine leases.

Streams – Surface disturbance may be restricted on 2,303 acres (22%) of 10 West HiLine leases and 6,618 acres (20%) of 25 non-West HiLine leases.

Soils/Slopes – Surface disturbance would be restricted on slopes over 30% or on slopes over 20% with severely erodable and slumping soils. This alternative affects 3,394 acres of 10 West HiLine leases and 10,687 acres of 30 non-West HiLine leases. These acreage figures with slopes greater than 30% are incorporated in the acreage figure with slopes over 20% with severely erodable and slumping soils.

Visual Resources – A controlled surface use requirement would affect all the oil and gas leases (Table 4.19).

Drilling Operations – Based on the RFD, applying stipulations and likely conditions of approval, there is the potential for 35 wells to be drilled on federal minerals in the Monument. There is also the potential for 21wells within 1/2 mile of the Monument on federal minerals.

This alternative would allow standard operating procedures and unrestricted access to monitor wells and facilities and would create only minimal impact to the natural gas resource.

Production Facilities and Equipment – The placement and construction of pipelines would follow standard operating procedures, including cross-country pipelines (Gold Book). This would create minimal impacts to the natural gas resource.

Table 4.19
Oil and Gas Leases Affected by the Stipulations and Likely Conditions of Approval
Alternative A (Current Management)

Stipulation/Condition of Approval	*West HiLine Leases*		*Non-West HiLine Leases Leases*		*All Leases*	
	No.	*Acres*	*No.*	*Acres*	*No.*	*Acres*
Greater Sage-Grouse						
Lek			1	31	1	31
Nesting Area	5	1,276	10	4,498	15	5,774
Winter Habitat	3	441			3	441
Black-Tailed Prairie Dog	1	72			1	72
Designated Sensitive Species	1	3	6	532	7	535
Deer and Elk Winter Range	9	6,986	18	19,137	27	26,123
Antelope Crucial Winter Range	7	2,561	9	3,588	16	6,149
Bighorn Sheep Distribution	4	3,080	13	11,164	17	14,244
Bighorn Sheep Lambing	4	1,059	11	5,504	15	6,563
Streams & Riparian/Wetland Areas	10	2,303	25	6,618	35	8,921
Soils/Slopes						
20% & Severely Erodable	10	3,394	30	10,687	40	14,081
30%	10	1,683	29	5,352	39	7,035
VRM Class						
Class I	1	92	6	1,386	7	1,478
Class II	6	3,789	23	16,470	29	20,259
Class IV	10	6,447	14	14,621	24	21,068

The production of natural gas would follow current regulations and standards to dispose of produced water. This would create no impact to the natural gas resource.

All standards for oil and gas reclamation currently meet or exceed the reclamation requirements under this alternative, and there would be only minimal impacts to the natural gas resource.

Alternative B

Seismic – There would be no impact to the natural gas resource.

Conditions of Approval – The conditions of approval would affect a portion of the oil and gas leases in the Monument (Table 4.20).

Greater Sage-Grouse – A condition of approval would prohibit surface disturbance within 1/4 mile of sage-grouse leks. Currently there are no known leks within 1/4 mile of the West HiLine leases; however, this would affect 31 acres of 1 non-West HiLine lease.

For nesting areas, the timing restriction from March 1 to June 15, would affect 1,276 acres of 5 West HiLine and 4,498 acres of 10 non-West HiLine oil and gas leases with a 107 day restriction.

For crucial winter habitat, the timing restriction from December 1 to March 31, would affect 441 acres of 3 West HiLine oil and gas leases with a 121 day restriction.

Black-Tailed Prairie Dogs – A condition of approval would prohibit surface disturbance on prairie dog towns. This would affect 72 acres of 1 West HiLine lease. If allowed to expand, it could affect up to 100 acres.

Designated Sensitive Species – There are no known designated sensitive species within 200 meters of the oil and gas leases.

Bald Eagle – Currently, there are no known roosting or nesting sites within in or near the existing oil and gas leases. There would be no impact to the natural gas resource.

Big Game Winter Range – A condition of approval would prohibit surface disturbance on identified winter ranges from December 1 to March 31. This timing restriction would affect 6,986 acres (68%) of 9 West HiLine leases in deer and elk winter range and 2,561 acres (25%) of 7 West HiLine leases in antelope crucial winter range. If this timing restriction is applied as a condition to the non-West HiLine leases, it would affect an additional 19,137 acres of 17 leases in deer and elk winter range and 3,588 acres of 9 leases in antelope crucial winter range for a period of 121 days.

Table 4.20
Oil and Gas Leases Affected by the Conditions of Approval – Alternative B

Condition of Approval	*West HiLine Leases*		*Non-West HiLine Leases Leases*		*All Leases*	
	No.	*Acres*	*No.*	*Acres*	*No.*	*Acres*
Greater Sage-Grouse						
Lek			1	31	1	31
Nesting Area	5	1,276	10	4,498	15	5,774
Winter Habitat	3	441			3	441
Black-Tailed Prairie Dog	1	72			1	72
Deer and Elk Winter Range	9	6,986	18	19,137	26	26,123
Antelope Crucial Winter Range	7	2,561	9	3,588	15	6,149
Bighorn Sheep Distribution	4	3,080	13	11,164	17	14,244
Bighorn Sheep Lambing	4	1,059	11	5,504	15	6,563
Soils/Slopes						
30%	10	1,683	29	5,352	39	7,035
VRM Class						
Class I	1	92	6	1,386	7	1,478
Class II	6	3,789	23	16,470	29	20,259
Class IV	10	6,447	14	14,621	24	21,068

Bighorn Sheep Distribution – The impacts would be the same as Alternative A.

Bighorn Sheep Lambing Areas – A condition of approval would prohibit surface disturbance in identified bighorn sheep lambing areas from April 1 to June 15. This timing restriction would affect 1,059 acres (16%) of 4 West HiLine leases and 5,504 acres (16%) of 11 non-West HiLine leases for a period of 76 days.

Streams – Surface disturbance would be prohibited within the channels of streams. There would be no impact to the natural gas resources.

Soils/Slopes – Surface disturbance on slopes 30% and greater would require an engineering and reclamation plan approved by the authorized officer. This would affect 1,683 acres of 9 West HiLine leases and 5,352 acres of 29 non-West HiLine leases.

Drilling Operations – Based on the RFD and applying the conditions of approval, there would be the potential for 44 wells to be drilled on federal minerals in the Monument. There would also be the potential for 23 wells within 1/2 mile of the Monument on federal minerals.

This alternative may cause an increase in the costs for drilling operations with the requirement for minimal surface disturbance (consider low impact drilling technology or multiple wells from one location).

This alternative would allow for unrestricted access to monitor wells and facilities. There would be no impact to the natural gas resource.

Production Facilities and Equipment – This alternative would increase the costs to mitigate noise levels and abate emissions on gas compression facilities. Other requirements would have an insignificant effect on the natural gas resource.

The placement and construction of pipelines would follow standard operating procedures including cross-country pipelines (Gold Book). There would be no impact to the natural gas resource.

The production of natural gas would follow current regulations and standards to dispose of produced water along with incorporating a wildlife escape ramp into a water disposal tank or pit. There would be no impact to the natural gas resource.

All standards for oil and gas reclamation currently meet or exceed the reclamation requirements under this alternative, and there would be no impact to the natural gas resource.

Alternative C

Seismic – Seismic activity would be restricted to designated roads with no surface blasting. This would restrict the industry's ability to identify geologic features worthy of further exploration, which may cause more impact than necessary.

Conditions of Approval – The conditions of approval would affect a portion of the oil and gas leases in the Monument (Table 4.21).

Greater Sage-Grouse – The impacts would be the same as Alternative B.

Black-Tailed Prairie Dogs – A condition of approval would prohibit or minimize surface disturbances on prairie dog towns. This would affect 72 acres of 1 West HiLine oil and gas lease. If prairie dogs are allowed to expand, it could affect up to 100 acres.

Designated Sensitive Species – A condition of approval would prohibit surface-disturbing activities within identified crucial habitat or within 1/4 mile of active nests. This would affect 3 acres (<1%) of 1 West HiLine and 532 acres of 6 non-West HiLine leases.

Bald Eagle – A condition of approval would prohibit surface disturbance within 1/2 mile of any nest that has been active within the last 7 years. Currently, there are no known roosting or nesting sites within or near the existing oil and gas leases in the Monument. There would be no impact to the natural gas resource.

Big Game Winter Range – The impacts would be the same as Alternative B.

Bighorn Sheep Distribution – A condition of approval would prohibit surface disturbances in identified bighorn sheep distribution areas from December 1 to March 31. This timing restriction would affect 3,080 acres (30%) of 4 West HiLine leases and 11,164 acres (37%) of 13 non-West HiLine leases for a period of 121 days.

Bighorn Sheep Lambing Areas – The impacts would be the same as Alternative B.

Streams – Surface disturbance would be prohibited within 1,000 feet of streams. This would affect 4,339 acres of 11 West HiLine leases and 12,171 acres (37%) of 25 non-West HiLine leases.

Soils/Slopes – Surface disturbance would be restricted on slopes over 30% or on slopes over 20% with severely erodable and slumping soils (requires an engineering and reclamation plan). Surface disturbance would also be

restricted on slopes 40% and greater. This would affect 3,394 acres of 10 West HiLine leases and 14,081 acres of 30 non-West HiLine leases. These acreage figures with slopes greater than 30% are incorporated in the acreage figure with slopes over 20% with severely erodable and slumping soils.

Visual Resources – A controlled surface use requirement would affect all the oil and gas leases (Table 4.21).

Drilling Operations – Based on the RFD and applying the conditions of approval, there would be the potential for 28 wells to be drilled on federal minerals in the Monument. There would also be the potential for 21wells within 1/2 mile of the Monument on federal minerals.

The requirement for minimal surface disturbance may cause an increase in the costs for drilling operations. Industry would probably consider low impact drilling technology or multiple wells from one location.

This alternative would allow for restricted access (types of vehicles and timing) to monitor wells and facilities.

Production Facilities and Equipment – This alternative would increase costs to mitigate noise levels and abate emissions on gas compression facilities. Other requirements would have an insignificant effect on the natural gas resource.

Pipelines would be required to stay within existing disturbance or the location that would create the least disturbance. The placement and construction of pipelines would follow standard operating procedures, including cross-country pipelines (Gold Book). There would be no impact to the natural gas resource.

The production of natural gas would follow current regulations and standards to dispose of produced water along with incorporating a wildlife escape ramp into a water disposal tank or pit. There would be no impact to the natural gas resource.

All standards for oil and gas reclamation currently meet or exceed the reclamation requirements under this alternative. There would be no impact to the natural gas resource.

Table 4.21
Oil and Gas Leases Affected by the Conditions of Approval – Alternative C

Condition of Approval	*West HiLine Leases*		*Non-West HiLine Leases Leases*		*All Leases*	
	No.	*Acres*	*No.*	*Acres*	*No.*	*Acres*
Greater Sage-Grouse						
Lek			1	31	1	31
Nesting Area	5	1,276	10	4,498	15	5,774
Winter Habitat	3	441			3	441
Black-Tailed Prairie Dog	1	72			1	72
Designated Sensitive Species	1	3	6	532	7	535
Deer and Elk Winter Range	9	6,986	17	19,137	26	26,123
Antelope Crucial Winter Range	7	2,561	9	3,588	16	6,149
Bighorn Sheep Distribution	4	3,080	13	11,164	17	14,244
Bighorn Sheep Lambing	4	1,059	11	5,504	15	6,563
Streams & Riparian/Wetland Areas	11	4,339	25	12,171	36	16,510
Soils/Slopes						
20% & Severely Erodable	10	3,394	30	10,687	40	14,081
30%	10	1,683	29	5,352	39	7,035
40%	8	753	25	2,399	33	3,152
VRM Class						
Class I	2	108	10	2,828	12	2,936
Class II	11	7,438	30	25,137	41	32,575
Class III	7	2,782	12	4,512	19	7,294

Alternative D

Seismic – Seismic activity would be restricted to helicopter supported seismic activities and no surface blasting would be allowed. This would restrict the industry's ability to identify geologic features worthy of further exploration. If not allowed to use other seismic techniques, this may cause more impact than necessary.

Conditions of Approval – The conditions of approval would affect a portion of the oil and gas leases in the Monument (Table 4.22).

Greater Sage-Grouse – The impacts would be the same as Alternative B.

Black-Tailed Prairie Dogs – A condition of approval would prohibit adverse surface-disturbing activities within 1/4 mile of prairie dog towns. This would affect 72 acres of 1 West HiLine lease.

Designated Sensitive Species – A condition of approval would prohibit surface-disturbing activities within identified crucial habitat or within 1/4 mile of active nests. This would affect 3 acres of 1 West HiLine lease and 532 acres (2%) of 6 non-West HiLine leases

The timing restriction from March 1 to August 1, within 1/2 mile of active nests would affect 71 acres (<1%) of 2 West HiLine leases and 2,118 acres (6.5%) of 9 non-West HiLine leases.

Bald Eagle – A condition of approval would prohibit surface disturbance within 1/2 mile of any nest that has been active within the last 7 years and within riparian nesting habitat. Currently, there are no known roosting or nesting sites within or near the existing oil and gas leases. There would be no impact to the natural gas resource.

Big Game Winter Range – A condition of approval would prohibit surface disturbance on identified winter ranges from December 1 to May 15. The timing restriction would affect 6,986 acres (68%) of 9 West HiLine leases in deer and elk winter range and 2,561 acres (25%) of 7 West HiLine leases in antelope crucial winter range. If the timing restriction is applied as a condition to the non-West HiLine leases, it would affect an additional 19,137 acres (59%) of 17 leases in deer and elk winter range and 3,588 acres of 9

Table 4.22
Oil and Gas Leases Affected by the Conditions of Approval – Alternative D

Condition of Approval	*West HiLine Leases*		*Non-West HiLine Leases Leases*		*All Leases*	
	No.	*Acres*	*No.*	*Acres*	*No.*	*Acres*
Greater Sage-Grouse						
Lek			1	31	1	31
Nesting Area	5	1,276	10	4,498	15	5,774
Winter Habitat	3	441			3	441
Black-Tailed Prairie Dog	1	72			1	72
Designated Sensitive Species						
1/4 Mile	1	3	6	532	7	535
1/2 Mile	2	71	9	2,117	11	2,188
Deer and Elk Winter Range	9	6,986	17	19,137	26	26,123
Antelope Crucial Winter Range	7	2,561	9	3,588	15	6,149
Bighorn Sheep Distribution	4	3,080	13	11,164	17	15,202
Bighorn Sheep Lambing	4	3,192	12	10,358	15	13,550
Streams & Riparian/Wetland Areas	11	5,492	26	15,259	37	20,751
Soils/Slopes						
20% & Severely Erodable	10	3,394	30	10,687	40	14,081
30%	10	1,683	29	5,352	39	7,035
40%	8	753	25	2,399	33	3,152
VRM Class						
Class I	2	108	10	2,828	12	2,936
Class II	12	10,220	31	29,649	43	39,869

leases in antelope crucial winter range for a period of 166 days.

Bighorn Sheep Distribution – The impacts would be the same as Alternative C.

Bighorn Sheep Lambing Areas – Prohibiting surface disturbance within 1 mile of identified bighorn sheep lambing areas would affect 3,192 acres (31%) of 4 West HiLine leases and 10,358 acres (30%) of 12 non-West HiLine leases.

Streams – Surface disturbance would be prohibited within 1/4 mile of streams. This would affect 15,482 acres of 11 West HiLine leases and 15,259 acres of 26 non-West HiLine leases.

Soils/Slopes – Surface disturbance would be restricted on slopes over 30% or on slopes over 20% with severely erodable and slumping soils (requires an engineering and reclamation plan). Surface disturbance would be restricted on slopes 40% and greater. This would affect 3,394 acres of 10 West HiLine leases and 14,081 acres of 30 non-West HiLine leases. These acreage figures with slopes greater than 30% are incorporated in the acreage figure with slopes over 20% with severely erodable and slumping soils.

Visual Resources – Surface-disturbing activities may be prohibited in VRM Class I areas. This would affect 108 acres (1%) of 2 West HiLine lease and 2,828 acres (9%) of 10 non-West HiLine leases. A controlled surface use requirement for VRM Class II would affect 10,220 acres of 12 West HiLine leases and 29,649 acres of 31 non-West HiLine leases.

Drilling Operations – Based on the RFD and applying the conditions of approval, there would be the potential for 13 wells to be drilled on federal minerals in the Monument. There would also be the potential for 20 wells within 1/2 mile of the Monument on federal minerals.

This alternative would limit the number of wells allowed per section to the current spacing (one well per section in the Sawtooth Mountain Field and general statewide spacing and two wells per section in the Leroy Field).

This alternative may cause an increase in the costs for drilling operations with the requirement for minimal surface disturbance. Industry would probably consider low impact drilling technology or multiple wells from one location.

This alternative would allow for restricted access (types of vehicles and timing) to monitor wells and facilities. Requiring seasonal use would restrict the operators' ability to maintain secure and safe operations.

Production Facilities and Equipment – This alternative would cause an increase in costs to mitigate noise levels and abate emissions on gas compression facilities. Other requirements would create insignificant effects on the natural gas resource.

Pipelines would be required to stay within the existing disturbance or access road. The placement and construction of pipelines would follow standard operating procedures (Gold Book). This may cause an increase in costs of operations due to increased pipeline distances.

The production of natural gas would follow current regulations and standards to dispose of production water along with incorporating a wildlife escape ramp into a water disposal tank or pit. There would be no transporting of the water via tankers; however, an operator would have the option to dispose of the water via a pipeline, disposal pits (including tanks) or an approved water disposal well. This may cause an increase the costs of operations or a reduction in production.

Travel on designated roads would be restricted to the minimal vehicle needed for the job. Due to resource issues, timing restrictions may be applied to site visits. This could affect the operators' ability to access some existing and potential well locations.

All standards for oil and gas reclamation currently meet or exceed the reclamation requirements under this alternative. There would be no impact to the natural gas resource.

Alternative E

Seismic – Seismic activity would be restricted to helicopter supported seismic activities and no surface blasting would be allowed. This would restrict the industry's ability to identify geologic features worthy of further exploration. Not allowing these seismic techniques may cause more impact than necessary.

Conditions of Approval – Surface disturbance would be prohibited on all 12 West HiLine oil and gas leases. This would include the entire leasehold and would affect 10,328 acres in the Monument area and 2,454 acres outside the Monument.

The conditions of approval would affect the non-West HiLine oil and gas leases in the Monument (Table 4.23).

Greater Sage-Grouse – A condition of approval would be attached to each APD which would prohibit surface disturbance within 2 miles of sage-grouse leks. This would affect 4,498 acres of 10 non-West HiLine leases (13.9%).

Designated Sensitive Species – A condition of approval would prohibit surface-disturbing activities within identi-

fied crucial habitat or within 1/2 mile of active nests. This would affect 2,117 acres (6.5%) of 9 non-West HiLine leases.

Big Game Winter Range – A condition of approval would prohibit surface disturbances on identified winter range. This would affect 19,137 acres (59%) of 17 leases in deer and elk winter range and 9 leases in 3,588 acres of antelope crucial winter range.

Bighorn Sheep Distribution – A condition of approval would prohibit surface disturbances on identified bighorn sheep distribution. This would affect 12,122 acres (37%) of 13 non-West HiLine leases.

Bighorn Sheep Lambing Areas – Prohibiting surface disturbance within 1 mile of identified bighorn sheep lambing areas would affect 10,358 acres (30%) of 12 non-West HiLine leases.

Streams – Surface disturbance would be prohibited within 1/4 mile of streams. This would affect 15,259 acres of 26 non-West HiLine leases.

Soils/Slope – Surface disturbance would be restricted on slopes over 20%. This would affect 11,616 acres of 30 non-West HiLine leases.

Visual Resources – Surface-disturbing activities would be prohibited in VRM Class I and II areas. This would affect all non-West HiLine leases (32,477 acres).

Table 4.23
Oil and Gas Leases Affected by the Conditions of Approval – Alternative E

Condition of Approval	***Non-West HiLine Leases***	
	No.	***Acres***
Greater Sage-Grouse		
Lek/Nesting Area	10	4,497
Designated Sensitive Species	9	2,117
Bald Eagle		
Deer and Elk Winter Range	17	19,137
Antelope Crucial Winter Range	9	3,594
Bighorn Sheep Distribution	13	12,122
Bighorn Sheep Lambing	12	10,358
Streams & Riparian/Wetland Areas	26	15,259
Soils/Slopes		
20%	30	11,616
VRM Class		
Class I	10	2,828
Class II	31	29,649

Drilling Operations – Based on the RFD and applying the conditions of approval, there would be the potential for no future drilling on federal minerals in the Monument. While future drilling would not be reasonably foreseeable, the following analysis addresses potential effects if additional wells are drilled.

This alternative would reduce the number of wells drilled within the Leroy Field from two wells per section to one well per section.

This alternative may cause an increase in the costs for drilling operations with the requirement for minimal surface disturbance. Industry may consider low impact drilling technology or multiple wells from one location.

This alternative would allow for restricted access (types of vehicles and timing) to monitor wells and facilities. Requiring operators to acquire approvals to access their operations would restrict the operator's ability to maintain secure and safe operations.

Production Facilities and Equipment – This alternative would increase costs to mitigate noise levels and abate emissions on gas compression facilities.

Pipelines would be required to stay within the existing disturbance or access road. The placement and construction of pipelines would follow standard operating procedures (Gold Book). This may increase the costs of operations due to increased pipeline distances.

The production of natural gas would follow current regulations and standards to dispose of produced water along with incorporating a wildlife escape ramp into a water disposal tank or pit. There would be no transporting of the water via tankers; however, the operator would have the option to dispose the water via a pipeline, disposal pits (including tanks) or dispose in a water disposal well. These requirements may cause an increase in costs of operations or a reduction in production.

Travel on designated roads would be restricted to the minimal vehicle needed for the job. Due to resource issues, timing restrictions may be applied to site visits. This would affect the operators' ability to access some potential well locations.

All standards for oil and gas reclamation currently meet or exceed the reclamation requirements under this alternative. There would be no impact to the natural gas resource.

Alternative F (Preferred Alternative)

Seismic – Seismic activity would be restricted to designated roads with limited surface blasting. This would restrict the industry's ability to identify geologic features

worthy of further exploration. Not allowing all seismic techniques may cause more impact than necessary.

Conditions of Approval – The conditions of approval would affect a portion of the oil and gas leases in the Monument (Table 4.24).

Greater Sage-Grouse – The impacts would be the same as Alternative B.

Black-Tailed Prairie Dogs – The impacts would be the same as Alternative D.

Designated Sensitive Species – Surface disturbance may be controlled or excluded within 1/4 mile of the proposed activity, or the activity could be delayed 90 days. Surface disturbance would be prohibited from March 1 to August 1 within 1/2 mile of ferruginous hawk nests. This would affect 3 acres of 1 West HiLine lease and 532 acres of 6 non-West HiLine leases.

Bald Eagle – The impacts would be the same as Alternative C.

Big Game Winter Range – The impacts would be the same as Alternative B.

Bighorn Sheep Distribution – The impacts would be the same as Alternative C.

Bighorn Sheep Lambing Areas – The impacts would be the same as Alternative B.

Streams – Surface disturbance would be prohibited within 500 feet of the channel of streams. This would affect 2,302 acres of 10 West HiLine leases and 6,618 acres (20%) of 25 non-West HiLine leases. However, oil and gas activities would be allowed within 500 feet of a stream as long as the ground surface of the site is 20 feet higher than the channel (out of the floodplain).

Soils – Surface disturbance would be restricted on slopes over 30% or on slopes over 20% with severely erodable and slumping soils (requires an engineering and reclamation plan). Surface disturbance would be restricted on slopes 40% and greater. This would affect 3,394 acres of 10 West HiLine leases and 14,081 acres of 30 non-West HiLine

Table 4.24
Oil and Gas Leases Affected by the Conditions of Approval
Alternative F (Preferred Alternative)

Condition of Approval	*West HiLine Leases*		*Non-West HiLine Leases Leases*		*All Leases*	
	No.	*Acres*	*No.*	*Acres*	*No.*	*Acres*
Greater Sage-Grouse						
Lek			1	31	1	31
Nesting Area	5	1,276	10	4,498	15	5,774
Winter Habitat	3	441			3	441
Black-Tailed Prairie Dog	1	72			1	72
Designated Sensitive Species	1	3	6	532	7	535
Deer and Elk Winter Range	9	6,986	17	19,137	26	26,123
Antelope Crucial Winter Range	7	2,561	9	3,588	15	6,149
Bighorn Sheep Distribution	4	3,080	13	11,164	17	14,244
Bighorn Sheep Lambing	4	1,059	11	5,504	15	6,563
Streams & Riparian/Wetland Areas	10	2,302	25	6,619	35	8,921
Soils/Slopes						
20% & Severely Erodable	10	3,394	30	10,687	40	14,081
30%	10	1,683	29	5,352	39	7,035
40%	8	753	25	2,399	33	3,152
VRM Class						
Class I	2	108	10	2,828	9	2,936
Class II	11	7,438	30	25,137	41	32,575
Class III	5	1,520	9	2,520	14	4,040
Class IV	7	1,262	8	1,992	15	3,254

leases. These acreage figures with slopes greater than 30% are incorporated in the acreage figure with slopes over 20% with severely erodable and slumping soils.

Visual Resources – Surface-disturbing activities may be prohibited in VRM Class I areas. This alternative would affect 108 acres (1%) of 2 West HiLine leases and 2,828 acres (9%) of 10 non-West HiLine leases. A controlled surface use requirement for VRM Class II, Class III and Class IV would affect 10,220 acres of West HiLine leases and 29,649 acres of non-West HiLine leases.

Drilling Operations – Based on the RFD and applying the conditions of approval, there would be the potential for 34 wells to be drilled on federal minerals in the Monument. There would also be the potential for 21wells within 1/2 mile of the Monument on federal minerals.

This alternative may cause an increase in the costs for drilling operations with the requirement for minimal surface disturbance. Industry may consider low impact drilling technology or multiple wells from one location.

Production Facilities and Equipment – This alternative would increase the costs to mitigate noise levels and abate emissions on gas compression facilities.

The production of natural gas would follow current regulations and standards to dispose of produced water along with incorporating a wildlife escape ramp into a water disposal tank or pit. There would be no impact to the natural gas resource.

Pipelines would be required to stay within existing disturbance or in the least intrusive location. The placement and construction of pipelines would follow standard operating procedures (Gold Book). This may increase the costs of operations due to increased pipeline distances.

Travel on designated roads would be restricted to the minimal vehicle needed for the job. Due to resource issues, timing restrictions may be applied to site visits. This would affect the operators' ability to access some potential well locations.

All standards for oil and gas reclamation currently meet or exceed the reclamation requirements under this alternative. There would be no impact to the natural gas resource.

Impacts to Minerals – Oil and Gas from Access and Transportation

Access

Alternatives A (Current Management) and B

Allowing public access on new resource roads used for natural gas operations would not affect natural gas operations. However, safety and security issues would increase when the public is allowed to access natural gas operations.

Alternatives C, D, E, and F (Preferred Alternative)

Restricting public access would create a positive impact for natural gas operations. Safety and security issues would be minimized.

Summary of Cumulative Impacts to Minerals – Oils and Gas

Cumulative impacts are illustrated by using the RFD wells in conjunction with the six alternatives. Each alternative presents varying degrees of restriction. Alternative A represents current management and it is second to least restrictive of the six alternatives. Alternative B represents the least restrictive alternative toward natural gas operations and allows the most development activity. Alternative E is very restrictive toward natural gas activity and basically stops further exploration and development from occurring in the Monument. Alternative F (Preferred Alternative) allows natural gas development to continue; however, at reduced levels from current management. Table K.1-2 in Appendix K presents the effects for each alternative.

Alternative A (Current Management)

Economics and market factors influence the rate and extent of natural gas exploration and development. Land use restrictions result in higher costs, and therefore may influence the rate of resource exploration and development. This alternative would allow natural gas exploration and development activity to occur at similar levels as prior to Monument designation. Natural gas exploration and development would occur over most of the leased area due to accessibility and restrictions.

Under this alternative, 35 wells could be drilled in the Monument along with another 21 wells within 1/2 mile of the Monument. A total of 56 wells could be drilled on federal leases within the next 15-20 years in the area. Another five wells could be drilled on state or fee minerals within 1/2 mile of the Monument. With a success rate of 35% throughout the area, and an average estimated ultimate

recovery of 390,000 MCF per well, this alternative could allow an additional 8.3 billion cubic feet (BCF) of gas to be produced; a 15% decrease from Alternative B.

Alternative B

Economics and market factors influence the rate and extent of natural gas exploration and development. Land use restrictions result in higher costs, and therefore influence the rate of resource exploration and development. This alternative would allow natural gas exploration and development activity to occur at similar or higher levels than current management. Exploration and development would occur over most of the leased area due to accessibility and restrictions.

Under this alternative, 44 wells could be drilled in the Monument along with another 23 wells within 1/2 mile of the Monument. A total of 67 wells could be drilled on federal leases within the next 15-20 years in the area. Another five wells could be drilled on state or fee minerals within 1/2 mile of the Monument. With a success rate of 35% throughout the area, and an average estimated ultimate recovery of 390,000 MCF per well, this alternative could allow an additional 9.8 BCF of gas to be produced.

Alternative C

Under this alternative, further land use restrictions and potential increased costs could cause moderately less activity and therefore less exploration and development. Natural gas exploration and development would occur over much of the leased area due to accessibility and restrictions, but less than Alternative A.

Under this alternative, 28 wells could be drilled in the Monument along with another 21 wells within 1/2 mile of the Monument. A total of 49 wells could be drilled on federal leases within the next 15-20 years in the area. Another five wells could be drilled on state or fee minerals within 1/2 mile of the Monument. With a success rate of 35% throughout the area and an average estimated ultimate recovery of 390,000 MCF per well, this alternative could allow an additional 7.4 BCF of gas to be produced; a 25% decrease from Alternative B.

Alternative D

There would be moderate to high impacts on the production of natural gas. Additional land use restrictions and potential increased costs could cause less activity and therefore less exploration and development. Natural gas exploration and development would be almost half of the activity allowed with Alternative B.

Under this alternative, 13 wells could be drilled in the Monument along with another 20 wells within 1/2 mile of the Monument. A total of 33 wells could be drilled on federal leases within the next 15-20 years in the area. Another five wells could be drilled on state or fee minerals within 1/2 mile of the Monument. With a success rate of 35% throughout the area and an average estimated ultimate recovery of 390,000 MCF per well, this alternative could allow an additional 5.2 BCF of gas to be produced; a 47% decrease when compared to Alternative B.

Alternative E

This alternative would be the most restrictive concerning production of natural gas.

Under this alternative, no wells would be drilled in the Monument but 18 wells could be drilled on federal leases within 1/2 mile of the Monument within the next 15-20 years. Another five wells could be drilled on state or fee minerals within 1/2 mile of the Monument. With a success rate of 35% throughout the area and an average estimated ultimate recovery of 390,000 MCF per well, this alternative could allow an additional 3.1 BCF of gas to be produced; a 68% decrease from Alternative B.

Alternative F (Preferred Alternative)

The impacts on the production of the natural gas resource would be moderate under this alternative. Restrictions and increased costs could cause less exploration and development activity. Natural gas production could occur over much of the leased area due to accessibility and restrictions, but less than Alternatives A and B.

Under this alternative, 34 wells could be drilled in the Monument along with another 21 wells within 1/2 mile of the Monument. A total of 55 wells could be drilled on federal leases within the next 15-20 years in the area. Another five wells could be drilled on state or fee minerals within 1/2 mile of the Monument. With a success rate of 35% throughout the area and an average estimated ultimate recovery of 390,000 MCF per well, this alternative could allow an additional 8.2 BCF of gas to be produced; a 16% decrease from Alternative B.

Recreation

Impacts to Recreation from Health of the Land and Fire

Fish and Wildlife – Mitigation

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Mitigation measures may maintain or increase opportunities for watchable wildlife viewing. However, seasonal restrictions for surface-disturbing activities may reduce or eliminate opportunities for recreation site development or activities with concentrated numbers of users.

Vegetation

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Solar pumps and fence exclosures would help maintain and improve riparian conditions for camping and other recreation activities.

Depending on facility location, solar pumps and fence exclosures used for riparian habitat protection and enhancement in VRM Class I areas may detract from the primitive character of the landscape and may not always conform with Class I guidelines.

Restoration initiatives may improve surface-disturbed areas in recreation sites.

Forest Products

Alternative A (Current Management)

Some areas of the Monument may be designated for personal use to cut Christmas trees, post and poles, firewood or logs.

Alternatives B and C

Areas may be designated for personal use to cut Christmas trees, post and poles, firewood or logs.

Alternative D

Areas may be designated for personal use to cut Christmas trees and firewood. With a permit, individuals would be allowed to utilize materials from wildland fires.

Alternative E

There would be no personal use of forest products.

Alternative F (Preferred Alternative)

Areas may be designated for personal use to cut Christmas trees and firewood. With a permit, individuals would be allowed to utilize materials from wildland fires.

Wild and Scenic Rivers

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

There would be no impact, as there would be no changes to the management of BLM land that would affect recreation resources.

Impacts to Recreation from Visitor Use, Services and Infrastructure

Recreation

Alternative A (Current Management)

Fees – Campers staying at the James Kipp Recreation Area would continue paying a $6 per vehicle/per night fee which has been in place since 1997. No other fees would be charged within the Monument.

Gateway Communities – Concession of facilities would provide economic opportunities for private businesses. In some cases, concession of facilities or services may provide visitor services not otherwise provided with BLM management of a site. Concession of sites may also instigate communication problems or create barriers inhibiting direct public feedback to the BLM when issues or concerns arise regarding site management.

Research, Collection, and Special Events – Special Recreation Permits (SRPs) for large events would ensure activities occur within parameters designed to protect the objects for which the Monument was designated and the experience of other BLM land users. Stipulations in the permit may inhibit some individual and group activities and opportunities.

Visitors wishing to use a metal detector would not have the opportunity to do so without first applying for and receiving a permit. Spontaneity to participate in activities involving a metal detector would be eliminated.

Collecting/removing invertebrate fossils and petrified wood may reduce opportunities for other BLM land users to observe similar natural history objects.

Archaeological and paleontological investigation and research may benefit science and provide opportunities for education and natural history observation. Removing re-

search findings may detract from the integrity of the Monument.

Recreation in Sensitive Wildlife Habitat – Horn hunting is a widespread activity that many visitors participate in. Under this alternative, opportunities for this activity would be unrestricted.

Camping on islands would be discouraged, but not restricted under this alternative. Boaters could camp on islands during critical wildlife nesting periods.

Interpretive Sites – Cultural and geological interpretation may occur under this alternative but the level is uncertain.

Alternative B

Fees – There would be no fees charged in the Monument. An $11,000 cleaning contract for the James Kipp Recreation Area may not be renewed. If not, at least one additional BLM maintenance employee would be needed to complete year around work currently performed by a local contractor. The loss of fee income may result in a seasonal closure of the campground, loss of the hosts staffing the site and elimination of trash dumpsters at the site.

Fee-generated income accounted for 24% of the total operational recreation budget allocated for management of the 149-mile UMNWSR in Fiscal Year 2005. This money was used to pay for the James Kipp Recreation Area cleaning contract, maintaining 21 vault toilets located between Fort Benton and the James Kipp Recreation Area, and providing service for trash dumpsters located at Coal Banks Landing, Judith Landing and the James Kipp Recreation Area. These amenities could be eliminated under this alternative.

Gateway Communities – Staffed sites in gateway communities may provide tourism-related economic opportunities. Visitors stopping for information may spend more time in the town than they otherwise might. Staffed sites would benefit visitors seeking information prior to entering BLM land. Informed users may exhibit a higher level of concern and appreciation for private and BLM land and compliance with rules and regulations may increase.

Research, Collection, and Special Events – SRPs for large events would ensure activities occur within parameters designed to protect the objects for which the Monument was designated and the experience of other BLM land users. Stipulations in the permit may inhibit some individual and group activities and opportunities.

Visitors would have the ability to use metal detectors, in some areas, without the restriction of a permit.

Collecting/removing invertebrate fossils and petrified wood may reduce opportunities for other BLM land users to observe similar natural history objects.

Archaeological and paleontological investigation and research may benefit science and provide opportunities for education and natural history observation. Removal of research findings may detract from the integrity of the Monument.

Recreation in Sensitive Wildlife Habitat – Horn hunting is a widespread activity that many visitors participate in. Opportunities for this activity would be unrestricted.

Boaters would not be discouraged from camping on islands. Their freedom to access campsites of their choice on islands would be unrestricted.

Interpretive Sites – This alternative would provide the most opportunities for cultural and geological interpretation. The potential for visual impacts from signs and exhibits viewable by boaters from the UMNWSR would also be the greatest. Small signs, not viewable from roads or the river, would provide some opportunity for interpretation and would also protect the primitive nature of the area from visual impacts.

Alternative C

Fees – The proposed fee under this alternative would not affect BLM land users in the Monument unless they camped overnight at a Level 1 site. An expanded amenity fee would be charged to camp at Wood Bottom, Coal Banks Landing, Judith Landing, and the James Kipp Recreation Area.

Visitors to Wood Bottom are typically seeking a quiet out-of-the-way spot to tent camp or park their RV or trailer and spend a weekend fishing or just relaxing next to the river. Many seek out this spot because there is minimal development and no fee. Charging a fee may displace many of the overnight users currently using the site.

Coal Banks Landing is the primary put-in point for river trips through the White Cliffs section of the river, and boaters are the primary overnight campers. There were 259 groups for a total of 1,218 people camped overnight in 2004. Approximately this number of visitors could be financially impacted by the fee.

The primary camper at Judith Landing is one who drives in specifically to camp in an RV or tent, but is not necessarily associated with launching a boat or participating on a trip down the river. Many of the campers are from the local area and come to Judith Landing to participate in annual gatherings or traditional weekend outings. They have never paid a fee for overnight camping at this site in the past. In addition, a small percentage of boaters going from Coal Banks Landing to the James Kipp Recreation Area stop and camp overnight at Judith Landing. Both groups of campers would be financially impacted by the fee.

Gateway Communities – Staffed sites in gateway communities may provide tourism-related economic opportunities. Visitors stopping for information may spend more time in the town than they otherwise might. Staffed sites would benefit visitors seeking information prior to entering public lands. Informed users may exhibit a higher level of concern and appreciation for private and public lands and compliance with rules and regulations may increase.

Research, Collection, and Special Events – Special events and large groups would not be assured an SRP under this alternative. Authorization would be on a case-by-case basis, and may be denied if the impacts from activities were deemed unacceptable.

Visitors would have ability to use metal detectors, in some areas, without the restriction of a permit.

Collecting/removing invertebrate fossils and petrified wood may reduce opportunities for other public land users to observe similar natural history objects.

Archaeological and paleontological investigation and research may benefit science and provide opportunities for education and natural history observation. Removing research findings may detract from the integrity of the Monument.

Recreation in Sensitive Wildlife Habitat – Horn hunters would have fewer opportunities under this alternative than they would under Alternatives A or B.

Boaters would not be discouraged from camping on islands. Their freedom to access campsites of their choice on islands would be unrestricted.

Interpretive Sites – The cultural and geological significance of the area attracts visitors to float the river. Providing low-key signs, not visible from the river would provide opportunities for information and education without disturbing the scenic character of the UMNWSR. However, visitors could lose some opportunities to see cultural interpretation on site and would be required to obtain guidebooks prior to beginning their trip or activity.

Alternative D

Fees – Fees would be charged at Level 1 sites with impacts the same as described in Alternative C.

In addition, boaters using the Missouri River between Fort Benton and the James Kipp Recreation Area would be required to register, acquire a Special Recreation Permit and pay the associated fee. Approximately 6,000 people register each year to boat the river.

In a 2001 visitor use survey, boaters on the Missouri River were asked if they would rather pay a fee to improve facilities or leave them as they are. Thirty-eight percent indicated they would rather pay a fee and 39% said they would rather not pay a fee and facilities be left as they are. Visitors were also asked about their household annual income. Forty-two percent indicated they earned more than $70,000 per year, 15% earned $60,000 to $69,000 per year, 9% earned $50,000 to $59,000, 12% earned $40,000 to $49,000 and 19% earned less than $40,000 per year. A fee to boat the river may have a financial impact, in varying degrees, on visitors using the river, and approximately half of all visitors may not support the fee system.

The income generated by this fee would enhance the BLM's ability to maintain facilities and services on the UMNWSR, enhance weed control efforts, provide funds to purchase short-term campsite leases, and assist local ambulance services and county search and rescue efforts.

Gateway Communities – Staffed sites in gateway communities may provide tourism-related economic opportunities. Visitors stopping for information may spend more time in the town than they otherwise might. Staffed sites would benefit visitors seeking information prior to entering BLM land. Informed users may exhibit a higher level of concern and appreciation for private and BLM lands and compliance with rules and regulations may increase.

Research, Collection, and Special Events – Special events and large groups would not be assured an SRP under this alternative. Authorization would be on a case-by-case basis, and may be denied if impacts from activities are deemed unacceptable.

Visitors would have ability to use metal detectors in some areas without a permit.

Collecting/removing invertebrate fossils and petrified wood may reduce opportunities for other public land users to observe similar natural history objects.

Archaeological and paleontological investigation and research may benefit science and provide opportunities for education and natural history observation. Removing research findings may detract from the integrity of the Monument.

Recreation in Sensitive Wildlife Habitat – Horn hunters would have fewer opportunities than in Alternatives A, B, and C as the seasonal restriction would occur when conditions for accessing BLM land would be the most favorable.

Under this alternative, boaters would be restricted seasonally (April 1 to July 31) from camping on islands. Most of the islands suitable for camping are located between Fort

Benton and Coal Banks Landing, and below Cow Island. Approximately 75% of the overnight use occurs between Coal Banks and Judith Landing where there are few islands suitable for camping. Boaters would have the opportunity to camp on islands prior to April 1 and after July 31.

Interpretive Sites – The cultural and geological significance of the area attracts visitors to float the river. Providing low-key signs, not visible from the river would provide opportunities for information and education without disturbing the scenic character of the UMNWSR. However, visitors could lose some opportunities to see cultural interpretation on site and would be required to obtain guidebooks prior to beginning their trip or activity.

Alternative E

Fees – Fees would be charged at Level 1 sites with impacts the same as described in Alternative C.

In addition, boaters using the Missouri River between Fort Benton and the James Kipp Recreation Area would be required to register, acquire a Special Recreation Permit and pay the associated fee. Approximately 6,000 people register each year to boat the river.

The income generated by this fee would enhance the BLM's ability to maintain facilities and services on the UMNWSR, enhance weed control efforts, provide funds to purchase short-term campsite leases, and assist local ambulance services and county search and rescue efforts.

Gateway Communities – The BLM would provide visitor information to local communities for educational and interpretative experiences.

Research, Collection, and Special Events – Large groups would not be authorized for activities within the Monument. Metal detectors would not be allowed. Invertebrates and fossils would remain intact and protected from removal. Research and investigations would not be allowed.

Recreation in Sensitive Wildlife Habitat – Opportunities for horn hunting would be eliminated under this alternative.

Camping on islands would not be allowed. This would protect nesting wildlife, but would reduce camping opportunities for boaters.

Interpretive Sites – This alternative does not provide an opportunity for cultural and geological information and education.

Alternative F (Preferred Alternative)

Fees – Fees would be charged at Level 1 sites and the impacts would be the same as described in Alternative C. In addition to the expanded amenity fee sites listed in Alternative C, fees would also go toward maintenance of cabins and corrals in the uplands.

Boaters using the Missouri River between Fort Benton and the James Kipp Recreation Area would be required to register, acquire a Special Recreation Permit and pay the associated fee. Approximately 6,000 people register each year to boat the river.

The income generated by this fee would enhance the BLM's ability to maintain facilities and services in the UMNWSR, maintain cabins and corrals, enhance weed control efforts, provide funds to purchase short-term campsite leases and would assist local ambulance services and county search and rescue efforts.

Gateway Communities – Staffed sites in gateway communities could provide tourism-related economic opportunities. Visitors stopping for information may spend more time in the town than they otherwise might. Staffed sites would benefit visitors seeking information prior to entering public lands. Informed users may exhibit a higher level of concern and appreciation for private and public lands and compliance with rules and regulations may increase.

Research, Collection, and Special Events – Visitors wishing to use a metal detector would not have the opportunity to do so without first applying for and receiving a permit. Spontaneity to participate in activities involving a metal detector would be eliminated.

Special events and large groups would not be assured an SRP under this alternative. Authorization would be on a case-by-case basis, and may be denied if impacts from activities are deemed unacceptable.

Archaeological and paleontological investigation and research may benefit science and provide opportunities for education and natural history observation. Removing research findings may detract from the integrity of the Monument.

Concentrated collection of plant material may lead to overharvesting in some areas.

Recreation in Sensitive Wildlife Habitat – Horn hunting is a widespread activity that many visitors participate in. Opportunities for this activity would be unrestricted, unless harassment or disturbance of wildlife would require implementing a seasonal restriction.

Under this alternative, boaters would be restricted seasonally (April 1 to July 31) from camping on islands. Most of the islands suitable for camping are located between Fort Benton and Coal Banks Landing, and below Cow Island. Approximately 75% of the overnight use occurs between

Coal Banks and Judith Landing where there are few islands suitable for camping. Boaters would have the opportunity to camp on islands prior to April 1 and after July 31.

Interpretive Sites – The cultural and geological significance of the area attracts visitors to float the river. Providing low-key signs, not visible from the river would provide opportunities for information and education without disturbing the scenic character of the UMNWSR. However, visitors could lose some opportunities to see cultural interpretation on site and would be required to obtain guidebooks prior to beginning their trip or activity.

Upper Missouri River Special Recreation Management Area

Alternative A (Current Management)

Special Recreation Use Permits – Limiting the number of SRPs issued for commercial floating/boating on the Missouri River at 23 would reduce opportunities for additional commercial use. During the past 3 years, nine additional commercial operators have expressed interest in applying for such a permit. While the number of permits is limited at 23, user days are not and commercial users can run as many trips as demand and staffing would allow. However, limiting the number of permits ensures new commercial operators would not add to the issues of campsite competition, conflicts with private boaters, and social and resource impacts. Commercial use went from 17% in 1997, to 31% in 2004.

One-time permits would allow universities and other groups that meet the definition of commercial use an opportunity to float/boat the Missouri River.

Opportunities for Boaters – River use is assumed to increase at a rate of 5% per year. With that assumption, use could reach 10,251 registered boaters per year by 2015. This increase in use may also increase sight and sound conflicts leading to reduced opportunities for a primitive experience on the river, greater trampling of vegetation at campsites, and greater competition for campsites, especially at high use sites such as Eagle Creek and Slaughter River.

This alternative would provide an opportunity for large groups to float the river without special restrictions, unless they have more than 50 people, at which point an SRP would be required. Groups of 50 detract from the primitive experience boaters seek on the Missouri River. Opportunities for sight and sound conflicts on the river and in campsites increase with group size. In 2004, most boaters preferred smaller groups with 87.5% traveling in groups of 10 or less, and 62.3 % in groups of four or less. Large groups tend to string out rather than stay in a compact flotilla. This tendency generally creates more sight and sound conflicts than a smaller, compact group. A large group could encompass 1/4 mile or more of the river when large gaps occur between individuals in the party. Impacts to campsites increase with group size, especially in the primitive Level 3 and 4 sites. Large groups may cause greater soil compaction, trample more vegetation and leave higher concentrations of human waste at Level 3 and 4 sites. Larger groups may also increase competition for campsites during busy periods by spreading out and encompassing multiple sites rather than staying contained in one site.

Camping Facilities – Facility development (Level 1, 2 or 3 sites) could occur on any section of the river if certain criteria are met. Visual impacts from additional signs and facilities could detract from the primitive nature of the UMNWSR.

Under current management, signs could be erected anywhere along the UMNWSR for any purpose. Signs would have the potential to detract from the visual quality and primitive setting of the UMNWSR.

Motorized Watercraft – The Missouri River is divided into three distinct areas of recreational opportunity: the upper river, White Cliffs and lower river sections. Under current management, the upper river section provides the least opportunity for solitude and a primitive experience. The White Cliffs section provides additional opportunities for solitude and a primitive experience, and the lower river section provides the greatest opportunity for solitude and a primitive experience. Depending on the type of opportunity desired, a boater may choose one or a combination of segments for their trip. The opportunity for motorized or non-motorized use, in combination with other factors, may influence a boater's choice.

River Mile 0 to 52 - Recreation Classification – Upstream and downstream travel would be allowed and would ensure an opportunity for visitors preferring to use motorboats to recreate on the Missouri River. Motorboats are currently used on a frequent basis in this segment for fishing and hunting. Non-motorized boaters using this segment of the river may be impacted by the sight, sound and smell of motorized craft. Most of the motorboat use occurs in the spring and fall when floater numbers are lowest. In 2004, 21.4 % of all registered boaters used this section of river. This section has fewer boaters as compared to the White Cliffs section, there is mostly private land with ranches and power lines visible along the shore and is classified as recreational in the wild and scenic river system.

Personal watercraft (PWC) use tends toward high speed play with associated noise levels that greatly annoy most other boaters and that are different in pitch and volume than other motorized craft. Their potential frequency and prox-

imity to other boaters, coupled with high pitched noise levels, impacts the experience most other boaters wish to enjoy.

River Mile 52 to 84.5 - Wild Classification – The White Cliffs section would provide boaters an opportunity to experience a more primitive setting than they might in the upper river section. The White Cliffs section contains four developed boater camps, and 78% of all boaters on the Missouri River travel this stretch of river. While this is classified as a wild segment of the river, the current level of facility development and current level of visitor use create a setting generally compatible with restricted motorized use (downstream travel only at a no-wake speed). The seasonal restriction on motorized use (the Saturday before the observed Memorial Day through the Sunday after Labor Day) would still allow for motorized travel in both directions during the shoulder seasons (generally the fishing and hunting seasons).

Boaters using this section of the river may be impacted by the sight, sound and smell of motorized craft, even when coming downstream at a no-wake speed, and it may detract from the primitive experience they desire.

Motorboat users would be restricted from the freedom of traveling in both directions during the no-wake timeframe. However, they would have access to the White Cliffs section and a primitive setting opportunity. Anglers and other motorized boat users would not have the opportunity to launch from Judith Landing (river mile 88.5) and come upstream beyond river mile 84.5, or launch from Coal Banks Landing (river mile 41.5) and go downstream beyond river mile 52.

River Mile 84.5 to 92.5 - Recreation Classification – Anglers and other motorized boaters would have the year-round opportunity to launch from Judith Landing (river mile 88.5) and come upstream to river mile 84.5, or launch from Coal Banks Landing (river mile 41.5) and go downstream to river mile 52.

Floaters coming through the White Cliffs section may be impacted by motorized craft going in both directions at plane speeds. Impacts could include visual disturbance, waves generated by boats operated at plane speeds and noise.

River Mile 92.5 to 149 - Combination of Wild and Scenic Classifications – This section of the river would provide visitors the greatest opportunity to experience solitude and the primitive nature of the UMNWSR. Unlike the White Cliffs section, this section has just one Level 2 site, which is located at river mile 131. In 2004, 21.5% of registered boaters (1,294 people) boated through this section of the river, as compared with 78% (4,682 people) in the White Cliffs segment.

The seasonal restriction on motorized use (the Saturday before the observed Memorial Day through the Sunday after Labor Day) would allow for motorized travel in both directions during the shoulder seasons (generally the fishing and hunting seasons) and downstream, no-wake travel during the restricted period. Floaters may be impacted by motorized craft going in both directions at plane speeds during the shoulder seasons. Impacts could include visual disturbance, waves generated by boats operated at plane speed and noise. Boaters using this section of the river during the restricted timeframe may be impacted by the sight, sound and smell of motorized craft (even when coming downstream at a no-wake speed) and it may detract from the primitive experience they desire. Bowhunters seeking a quiet atmosphere during their elk hunt may be impacted by the noise of motorboats traveling at plane speed in both directions.

The use of motorized craft by the general public would be restricted to downstream travel only at a no-wake speed from the Saturday before the observed Memorial Day to the Sunday after Labor Day. The majority of complaints about motorized use during the seasonal restriction period stem from administrative use of motorized craft. Administrative use occurs across a broad spectrum of resource management needs and includes motorboat use for research, law enforcement, ranchers accessing grazing allotments, and BLM recreation, weed, range and riparian specialists. Under this alternative, administrative use of motorboats would not be restricted.

In the past 5 years there has been no BLM-documented case of a floatplane landing on any section of the river outside of the Fort Benton area. Floatplanes and their associated noise levels may impact the experience most boaters wish to enjoy, although the noise and visual impact from a floatplane would be better tolerated in the recreational segments where motorized boat use is allowed year around.

Alternative B

Special Recreation Use Permits – Issuing unlimited SRPs for commercial use could increase competition for campsites, increase conflicts with private boaters and increase social and resource impacts. The registered boaters accompanying a commercial outfitter increased 8.2% between 2000 (the year the moratorium began) and 2004. Further, there is a difference of 903 registered boaters when comparing 2004 visitor use totals with 2000 totals. Of the 903 additional boaters, 705, or 78%, were boaters accompanying a commercial outfitter. During the past 3 years, nine additional commercial operators have expressed interest in acquiring an SRP for the Missouri River. Subsequently, based on 2000-2004 boater registration data and the number of potential commercial operators, visitor use on the Missouri River would be more likely to increase from commercial use than from private use.

Opportunities for Boaters – River use is assumed to increase at a rate of 5% per year. With that assumption use could reach 10,251 registered boaters per year by 2015. This increase in use may also increase sight and sound conflicts leading to reduced opportunities for a primitive experience on the river, greater trampling of vegetation at campsites, and greater competition for campsites, especially at high use sites such as Eagle Creek and Slaughter River.

Impacts would be similar, but more extensive than in Alternative A as opportunities for groups over 50 people would be unlimited. Opportunities for solitude would be reduced and competition for campsites would be increased, especially at popular sites such as Eagle Creek and Slaughter River.

Camping Facilities – Facility development (Level 1, 2 or 3 sites) could take place on any section of the river as needed. Appropriate signing could be used at any level of facility development. Visual impacts from additional signs and facilities could detract from the primitive nature of the UMNWSR.

Motorized Watercraft

River Mile 0 to 52 - Recreation Classification – Upstream and downstream travel would be allowed and would ensure an opportunity for visitors preferring to use motorboats to recreate on the Missouri River. Motorboats are currently used on a frequent basis in this segment for fishing and hunting. Non-motorized boaters using this segment of the river may be impacted by the sight, sound and smell of motorized craft.

River Mile 52 to 84.5 - Wild Classification – Motorboat users would have the opportunity to travel upstream and downstream throughout the year in this segment. Boaters using this segment of the river may be impacted by the sight, sound and smell of motorized craft and it may detract from the primitive experience they desire. Float boaters would not have the opportunity to enjoy a primitive setting free from the sound and visual impacts of motorboats on plane as compared to Alternative A. Floaters coming through the White Cliffs section may be impacted by motorized craft going in both directions at plane speeds. Impacts could include visual disturbance, waves generated by boats operated at plane speed and noise.

River Mile 84.5 to 92.5 - Recreation Classification – Anglers and other motorized boaters would have the opportunity to launch from Judith Landing (river mile 88.5) and travel upstream to river mile 84.5 or travel downstream to river mile 92.5 year round.

River Mile 92.5 to 149 - Combination of Wild and Scenic Classifications – Motorboat users would have the opportunity to travel upstream and downstream throughout the year in this segment. Floaters using this segment of the river may be impacted by the sight, sound and smell of motorized craft and it may detract from the primitive experience they desire. Float boaters would not have the opportunity to enjoy a primitive setting free from the sound and visual impacts of motorboats on plane as compared to Alternative A.

Under this alternative, administrative use of motorboats would not be restricted.

Opportunities for PWC and floatplanes to access the UMNWSR would be increased compared to current management. PWC or floatplanes and their associated noise levels may impact the experience of most other boaters. Floatplanes may impact the quiet, primitive setting the wild and scenic classified segments offer visitors, and those seeking a primitive experience may be disrupted by the approach, landing and takeoff of a floatplane.

Alternative C

Special Recreation Use Permits – An additional seven permits beyond the current level of 23 would be allowed. Seven additional operators could increase competition for campsites and conflicts with private boaters.

Opportunities for Boaters – Standards and indicators would be used to manage use opportunities. Indicators reflect the overall condition of a specific segment of river and standards reflect the minimum acceptable conditions for each indicator. Management actions would be implemented to ensure standards are not exceeded. Under this alternative, allocation of visitors would not be a management option. As visitor use patterns change or numbers increase, additional restrictions on boaters would be implemented to maintain the standard. Use levels could be exceeded under this alternative to a point where restrictions on boaters would be insufficient to maintain the standards. This alternative provides an opportunity for boaters to continue using the river without the encumbrance of an allocation system. This would allow the public access to the resources of the Missouri River without competition. Within the framework of required visitor use restrictions, boaters could access the river when they choose.

Historically Sunday, Monday and Tuesday are the busiest launch days on the river, and June 15 to August 1 is the busiest portion of the river season. During that portion of the season, groups of 20 or more would be restricted to the historically slower launch days of Wednesday, Thursday and Friday which may cause logistical inconvenience for those groups. Groups of 20 or larger could still launch unrestricted before June 15 and after August 1. Groups of less than 20 (96.5% of groups in 2004) may have greater opportunity for solitude on the river and in campsites. River

use may also be spread more evenly through the week. Boaters who purposefully seek slower weekdays to launch may be subjected to larger groups and more people than under Alternatives A and B.

Camping Facilities – Level 1 site construction would take place only in recreational sections of the river. Additional Level 2 site construction may occur between Fort Benton and Judith Landing. This section currently has four Level 2 sites and receives approximately 75% of the total boater use. Additional Level 2 sites could detract from the primitive nature of the river in this section.

The length of stay requirement at Level 2 sites from June 15 to August 1 would provide more camping opportunities during the busiest portion of the river season. Those choosing to camp in primitive settings, free of development, would require additional equipment for camp fires and knowledge of Leave No Trace camping. Additional education efforts may be required for boaters seeking a Level 4 camping experience.

Signs would be carefully managed to ensure the visual quality and primitive setting of the UMNWSR is not diminished. Those seeking Level 4 camping opportunities must rely on map reading skills and be willing to seek and explore to locate a site.

Motorized Watercraft

River Mile 0 to 52 - Recreation Classification – Upstream and downstream travel would be allowed and would ensure an opportunity for visitors preferring to use motorboats to recreate on the Missouri River. Motorboats are currently used on a frequent basis in this section for fishing and hunting. Non-motorized boaters using this section of the river may be impacted by the sight, sound and smell of motorized craft and it may detract from their trip.

Opportunities for using PWC and landing floatplanes would be greatly diminished as compared with Alternative A. PWC are rarely seen on this section of the Missouri River.

River Mile 52 to 84.5 - Wild Classification – The White Cliffs section provides boaters an opportunity to experience a more primitive setting than they might in the upper river section. The White Cliffs section contains four developed boater camps, and 78% of all boaters on the Missouri River travel this stretch of the river. While this is classified as a wild segment of the river, current levels of facility development and visitor use create a setting generally compatible with restricted motorized use (downstream travel only at a no-wake speed).

The seasonal restriction on motorized use (June 15-September 15) would allow 10 days of additional motorized travel in both directions as compared to Alternative A. The time period from June 5 to June 15, would provide additional opportunities for anglers or other motorized boaters to access this section by motorized craft. June 15 to August 1, is considered the busiest portion of the season; however, the number of river floaters begins to increase following Memorial Day weekend.

Boaters using this section of the river may be impacted by the sight, sound and smell of motorized craft (even when coming downstream at a no-wake speed) and it may detract from the primitive experience they desire. In 2004 approximately 300 boaters used the river between June 5 and June 15.

There would be no opportunities for the use of PWC or landing of floatplanes in this section.

River Mile 84.5 to 92.5 - Recreation Classification – Anglers and other motorized boaters would have the opportunity to launch from Judith Landing (river mile 88.5) and travel upstream to river mile 84.5 and travel downstream to river mile 92.5 year round. Paddlers coming through the White Cliffs section may be impacted by motorized craft going in both directions at plane speeds. Impacts to paddlers could include visual disturbance, waves generated by boats operated at plane speed and noise.

There would be no opportunities for the use of PWC in this section. Floatplanes would be allowed in this section from September 16 to June 4.

River Mile 92.5 to 149 - Combination of Wild and Scenic Classifications – This section of the river provides visitors the greatest opportunity to experience solitude and the primitive nature of the UMNWSR. Unlike the White Cliffs section, this section has just one Level 2 site, which is located at river mile 131. In 2004, 21.5% of registered boaters (1,294 people) boated through this section of the river, as compared with 78% (4,682 people) in the White Cliffs section.

The seasonal restriction on motorized use (June 15-September 15) would allow for 10 days of additional motorized travel in both directions as compared to Alternative A. The time period from June 5 to June 15 would provide additional opportunities for anglers or other motorized boaters to access this section by motorized craft. June 15 to August 1, is considered the busiest portion of the season; however, the number of river floaters begins to increase following Memorial Day weekend.

This alternative differs from Alternative A in that it would allow motorboat use to occur during Memorial Day Weekend, and would allow paddlefish anglers the opportunity to go upstream from the Fred Robinson Bridge. This alternative also extends the motorized restriction into archery season (until September 15) which allows archers hunting

the river above the Fred Robinson Bridge the opportunity to hunt without noise impacts from motorboats for at least a portion of the season. It also decreases the opportunity, compared to Alternative A, for bowhunters to access public lands upstream of the Fred Robinson Bridge via motorboat. Compared to Alternative A, this alternative provides an additional 5 days of motorboat use in May/June, and extends an additional 5 days of non-motorized use in September, depending on where the observed Memorial and Labor weekend fall on the calendar.

There would be no opportunities for the use of PWC or landing of floatplanes in this section.

Avoiding peak days of use would decrease the opportunity for conflicts between paddlers and motorboats used for administrative use. Use agreements with other agencies would ensure administrative motorboat use and operation policy is consistent between all agencies. Agencies could work together to keep noise and visual impacts of motorized boats as minimal as possible without compromising completion of required work.

The opportunity for a primitive boating experience in the segments classified as wild and scenic would not be disrupted by the noise and visual impact of a floatplane approaching, landing and taking off. Floatplanes would still have the opportunity to access the UMNWSR, but only in specific sections and during specific timeframes.

Alternative D

Special Recreation Use Permits – An additional seven permits beyond the current level of 23 would be allowed. Seven additional operators could increase competition for campsites and conflicts with private boaters.

Opportunities for Boaters – Standards and indicators would be used to manage use opportunities. The public benefit of managing use with this approach is the sustained opportunity to recreate in a mostly primitive, natural landscape and social setting. Indicators reflect the overall condition of a specific section of river and standards reflect the minimum acceptable conditions for each indicator. Management actions would be implemented to ensure standards are not exceeded. Under this alternative, allocation of visitors would be an option to ensure standards are not exceeded. An allocation system would reduce freedom of access to the UMNWSR. Boaters may not have the opportunity to access the river during their desired timeframe, or may not have an opportunity for any river access during a season of use.

This alternative would be more restrictive than Alternatives A, B, or C as boaters in groups larger than 30 would be required to apply for an SRP. In 2004, 1.6% of groups were larger than 30. The SRP may stipulate restrictions such as the day they can launch and the campsites they must use. Freedom to choose river access days and camping opportunities may be eliminated. Further, the SRP authorization is not guaranteed and may be denied depending on desired launch days.

Camping Facilities – There would be no additional Level 1 sites along the UMNWSR. Level 2 sites would be constructed only in recreational segments of the river. The primitive nature of the UMNWSR would be protected from the visual impact of additional facilities. Additional opportunities for boaters to use developed facilities would not occur except in recreational sections. Additional sites to facilitate access to the river would not occur.

The length of stay requirement at Level 2 sites from June 15 to August 1 would provide more camping opportunities during the busiest portion of the river season. Those choosing to camp in primitive settings, free of development, would require additional equipment for camp fires and knowledge of Leave No Trace camping. Additional education efforts may be required for boaters seeking a Level 4 camping experience.

Those seeking Level 3 and 4 camping opportunities must rely on map reading skills and be willing to seek and explore to locate a site.

Motorized Watercraft

River Mile 0 to 52 - Recreation Classification – Upstream and downstream travel would be allowed and would ensure an opportunity for visitors preferring to use motorboats to recreate on the Missouri River. Motorboats are currently used on a frequent basis in this section for fishing and hunting. Non-motorized boaters using this section of the river may be impacted by the sight, sound and smell of motorized craft and it may detract from their trip.

PWC would not have access to the UMNWSR between September 15 and June 15. This would decrease year around opportunities to access the river but would increase the amount of the upper river section PWC could operate in as compared to Alternative C. Boaters using the river in the shoulder seasons may be impacted by PWC, especially hunters and anglers.

Floatplanes could only use the first 3 miles of the river near Fort Benton.

River Mile 52 to 84.5 - Wild Classification – The seasonal motorboat restriction would encompass most of the season of use (May 1 to November 30). Opportunities to use motorboats at plane speeds both directions on the river would be restricted to periods of the year when environmental conditions and river levels could make such travel difficult.

Floaters would experience a longer timeframe when motorized boats would be restricted to downstream travel only at no-wake speeds as compared to Alternatives A and F.

Hunters accessing the river for upland bird and big game hunting opportunities could do so only by boating downriver to their destination. The sound of motorized craft operating at plane speeds would not be heard during the majority of hunting season.

There would be no opportunities for the use of PWC or the landing of floatplanes in this section.

River Mile 84.5 to 92.5 - Recreation Classification – Anglers and other motorized boaters would have the opportunity to launch from Judith Landing (river mile 88.5) and travel upstream to river mile 84.5 or travel downstream to river mile 92.5 year round. Paddlers coming through the White Cliffs section may be impacted by motorized craft going in both directions at plane speeds. Impacts to paddlers could include visual disturbance, waves generated by boats operated at plane speed and noise.

PWC would not have access to the UMNWSR between September 15 and June 15. This would decrease year around opportunities to access the river but would increase the amount of the river section PWC could operate in as compared to Alternative C. Boaters using the river in the shoulder seasons may be impacted by PWC, especially hunters and anglers.

There would be no opportunities for the landing of floatplanes in this section.

River Mile 92.5 to 149 - Combination of Wild and Scenic Classifications – This section of the river would provide visitors the greatest opportunity to experience solitude and the primitive nature of the UMNWSR. Unlike the White Cliffs section, this section has just one Level 2 site, which is located at river mile 131. In 2004, 21.5% of registered boaters (1,294 people) boated through this section of the river, as compared with 78% (4,682 people) in the White Cliffs section.

There would be no motorized use from June 15 through September 15 and downstream travel only at a no-wake speed from September 16 to November 30. This would provide a recreation opportunity for boaters seeking solitude and a primitive experience free from the sight, sound and smell impacts of motorized craft. As compared to Alternative A, opportunities for boaters to experience a predominantly primitive setting would increase.

As compared to Alternative A, motorized use opportunities would decrease under this alternative. Motorized users currently have the opportunity to go downstream at a no-wake speed through this section from the Saturday before the observed Memorial Day through the Sunday after Labor Day. Motorized use under this alternative would be restricted to the shoulder seasons of use, and would be further restricted compared to Alternative A, B, C or F as the shoulder seasons of use would be restricted to downstream travel at a no-wake speed. There would be no opportunity, year around, for motorized craft to operate at plane speeds in both directions on this section of the river.

Opportunities for floaters to experience a primitive trip free of the sight, smell and sound impacts of motorized craft would increase compared to Alternatives A, C, and F.

There would be no opportunities for the use of PWC or the landing of floatplanes in this section.

Noise and visual impacts from BLM motorboats traveling upstream would be eliminated. Use agreements with other agencies would ensure consistent administrative motorboat use and operation policy among all agencies. However, noise and visual impacts may continue to occur.

Opportunities for those wishing to access the UMNWSR by floatplane would be greatly reduced compared to current management as only 3 miles of the 149 miles would be accessible. Potential conflicts with boaters from noise levels and visual impacts would be eliminated, except for the 3-mile section.

Alternative E

Special Recreation Use Permits – An allocation of use for both private and commercial boaters would occur with this alternative, and each commercial operator may be assigned a specific number of user days. There would be no potential for a further increase in visitor use from commercial river trips. Competition for campsites and conflicts with private boaters would not increase. Commercial river guiding businesses would have little or no opportunity for growth and expansion of their client base.

Opportunities for Boaters—The carrying capacity of the river would be established at the current level of visitor use. An allocation system would be developed and implemented based on that level of use. In 2004, 5,993 boaters registered to boat the river. A 2002 survey of users ranked crowding at 2.4 on a scale ranging from 0 to 9 (0 is the lowest amount of crowding and 9 the highest). Implementing an allocation system at current use levels may establish a carrying capacity that is well below an acceptable level or standard of visitor use. As a result, future boaters may be denied access opportunities to the river. Implementing an allocation system based on current use levels would ensure that crowding does not occur and opportunities for privacy and solitude would be maintained.

This alternative would be the most restrictive on boater group size as groups larger than 16 would be required to apply for an SRP. In 2004, 5.6% of groups were larger than 16. As in Alternative D, the SRP may stipulate restrictions and the authorization may be denied.

Camping Facilities – There would be no facility development beyond current levels. Construction of facilities that may detract from the primitive nature of the UMNWSR would not occur.

During the busiest portion of the season (June 15-August 1), a 2-night stay limit would help alleviate congestion at Level 2 sites, ensure a consistent flow of traffic downriver, and open camping opportunities for new boaters entering the sites. The 2-night limit would also alleviate sight and sound impacts as the incidence of boater accumulation in a specific area would be reduced.

Those choosing to camp in primitive settings, free of development, would require additional equipment for camp fires and knowledge of Leave No Trace camping. Additional education efforts may be required for boaters seeking a Level 4 camping experience.

Those seeking Level 2, 3, and 4 camping opportunities must rely on map reading skills and be willing to seek and explore to locate a site.

Motorized Watercraft

River Mile 0 to 52 - Recreation Classification – Opportunities for use of motorized watercraft, including PWC and floatplanes, would be eliminated. The ability of many hunters and anglers to use motorized watercraft in this section to access fishing and hunting opportunities would be eliminated.

River Mile 52 to 84.5 - Wild Classification – Noise and visual impacts from motorized use would be eliminated. Opportunities for users choosing motorized access to hunt and view the UMNWSR would also be eliminated.

River Mile 84.5 to 92.5 - Recreation Classification – Anglers and hunters using motorized craft would not have access to recreation opportunities in this river section as in Alternatives A, B, C, D, and F. Floaters finishing their trip through the White Cliffs section or beginning their trip in the lower section would not incur the noise and visual impacts of motorized use.

River Mile 92.5 to 149 - Combination of Wild and Scenic Classifications – Noise and visual impacts from motorized use would be eliminated. Opportunities for users choosing motorized access to hunt and view the UMNWSR would also be eliminated. The ability of many hunters and anglers to use motorized watercraft in this section during the shoulder seasons to access fishing and hunting opportunities would be eliminated.

Noise and visual impacts from all agency motorboats would be eliminated under this alternative. The public and administrative use of motorized craft would be consistent.

Floatplanes would have no opportunity to access the UMNWSR. All possible conflicts with boaters would be eliminated.

Alternative F (Preferred Alternative)

Special Recreation Use Permits – Limiting the number of SRPs issued for the Missouri River would reduce opportunities for additional commercial use of the resource. During the last 3 years, nine additional commercial operators have expressed interest in applying for a permit on the Missouri River. While the number of commercial operators is limited under this alternative, user days are not, and commercial users can run as many trips as demand allows. However, limiting the number of permits would ensure new, additional commercial operators would not be adding to the issues of campsite competition, conflicts with private boaters and social and resource impacts. Commercial use went from 17% of the use in 1997 to 29% of the use in 2004.

One-time permits would allow universities and other groups that meet the definition of commercial use an opportunity to use the UMNWSR.

Opportunities for Boaters – Standards and indicators would be used to manage use opportunities. The public benefit of managing use with this approach is the sustained opportunity to recreate in a mostly primitive, natural landscape and social setting. Indicators reflect the overall condition of a specific section of the river and standards reflect the minimum acceptable conditions for each indicator. Management actions would be implemented to ensure standards are not exceeded. As visitor use patterns change or numbers increase, additional restrictions on boaters may be implemented to maintain the standard if use levels could be exceeded to a point where current restrictions are insufficient. This alternative provides an opportunity for boaters to continue using the river without an allocation system and the public would continue to have access to the resources and recreation opportunities of the Missouri River without competition. Within the framework of required visitor use restrictions, boaters could access the river when and where they choose.

Camping Facilities – Facility development would not detract from the wild and scenic river classification standards, and would ensure boaters had a range of opportunities to fit their desired camping experience. Disturbance to vegetation from Level 1 construction would occur only in recreational segments of the river. Disturbance to vegeta-

tion could occur in the wild and scenic segments for development of Level 2 sites, and would be minimized to ensure visual integrity of the resource is maintained. Development of new Level 3 sites would remove vegetation within a core area near the fire ring. Impacts to vegetation would be monitored to ensure they do not exceed standards for campsite condition.

During the busiest portion of the season (June 15-August 1), a 2-night limit would alleviate congestion at the busy Level 2 sites, ensure a consistent flow of traffic downriver, and provide camping opportunities for new boaters entering the sites. The 2-night limit would also alleviate sight and sound impacts as the incidence of boater accumulation would decline.

Those choosing to camp in primitive settings, free of development, would require additional equipment for camp fires and knowledge of Leave No Trace camping. Additional education efforts may be required for boaters seeking a Level 4 camping experience.

Signs would be carefully managed to ensure the visual quality and primitive setting of the UMNWSR is not diminished. Those seeking Level 4 camping opportunities must rely on map reading skills and be willing to seek and explore to locate a site.

Motorized Watercraft

River Mile 0 to 52 - Recreation Classification – Leaving this upper section open for upstream and downstream travel would ensure an opportunity for visitors preferring to use motorboats to recreate on the Missouri River.

Opportunities for use of PWC would be greatly diminished. PWC are rarely seen on this section of the Missouri River. Opportunities for those wishing to access the UMNWSR by floatplane would be greatly reduced. Only 3 miles of the 149 miles would be accessible. Potential conflicts with boaters from noise levels and visual impacts would be eliminated except for the 3-mile section.

River Mile 52 to 84.5 — Wild Classification – This White Cliffs section would provide boaters an opportunity to experience a more primitive setting than they might in the upper section. This section contains four developed boater camps, and 78% of all boaters on the Missouri River travel this stretch of river. While this portion of the Missouri River is classified as wild, current levels of facility development and visitor popularity create a setting compatible for restricted motorized use (downstream travel only at a no-wake speed). The seasonal restriction on motorized use would still allow for motorized travel in both directions during the shoulder seasons (generally the fishing and hunting seasons).

Boaters using this section of the river may be impacted by the sight, sound and smell of motorized craft (even when coming downstream at a no-wake speed) and it may detract from the primitive experience they desire.

Motorboat users would lose the mobility of traveling in both directions during the no-wake time frame. However, they would continue to have access to the White Cliffs section and a primitive setting opportunity. Anglers would not have the opportunity to launch from Judith Landing (river mile 88.5) and come upstream beyond river mile 84.5, or launch from Coal Banks Landing (river mile 41.5) and go downstream beyond river mile 52, from June 5 through September 15.

There would be no opportunities for the use of PWC or the landing of floatplanes in this section.

River Mile 84.5 to 92.5 - Recreation Classification – Anglers and other motorized boaters would have the opportunity year round to launch from Judith Landing (river mile 88.5) and travel upstream to river mile 84.5, or launch from Coal Banks Landing (river mile 41.5) and travel downstream to river mile 52. Paddlers coming through the White Cliffs section may be impacted by motorized craft going in both directions at plane speeds. Impacts could include visual disturbance, waves generated by boats operated at plane speed and noise.

There would be no opportunities for the use of PWC or the landing of floatplanes in this section.

River Mile 92.5 to 149 - Combination of Wild and Scenic Classifications – This portion of the river provides visitors the greatest opportunity to experience solitude and the primitive nature of the UMNWSR. Unlike the White Cliffs section, this section has just one Level 2 site, which is located at river mile 131. In 2004, 21.5% of registered boaters (1,294 people) boated through this section of the river, as compared with 78% (4,682 people) in the White Cliffs section.

There would be no motorized use from June 5 through September 15. This would provide a recreation opportunity for boaters seeking solitude and a primitive experience free from the site, sound and smell impacts of motorized craft. As compared to Alternative A, opportunities for boaters to experience a predominantly primitive setting would increase.

Motorized use opportunities would decrease under this alternative and would be restricted to the shoulder seasons of use, prior to June 5 and after September 15, when motorized watercraft could travel in both directions at plane speeds.

This alternative would allow motorboat use to occur during Memorial Day Weekend, and would allow paddlefish anglers the opportunity to go upstream from the Fred Robinson Bridge. This alternative also extends the motorized restriction into archery season (until September 15) which would allow archers hunting the river above the Fred Robinson Bridge the opportunity to hunt without noise impacts from motorboats for a portion of the season. It also decreases the opportunity, compared to Alternative A, for bowhunters to access public lands upstream of the Fred Robinson Bridge via motorboat. Compared to Alternative A, this alternative would provide an additional 5 days of motorboat use in May/June, and extend an additional 5 days of non-motorized use in September, depending on where the observed Memorial Day and Labor Day weekends fall on the calendar.

There would be no opportunities for the use of PWC or the landing of floatplanes in this section.

Avoiding peak days of use would decrease the opportunity for conflicts between floaters and motorboats used for administrative use. Use agreements with other agencies would ensure the administrative motorboat use and operation policy is consistent among all agencies. Agencies could work together to keep noise and visual impacts of motorized boats to as low a level as possible without compromising completion of required work. Noise and visual impacts would continue to occur on days outside peak use periods.

Uplands Special Recreation Management Area

Alternative A (Current Management)

Special Recreation Use Permits – With no limit on the number of commercial SRPs issued for hunting in the uplands, the potential for conflicts between commercial and general public hunters would exist, especially if there would be a rapid and large increase in SRP applications.

Assigning the permit to a specific area, based on knowledge of visitor use patterns and numbers, could decrease conflicts between commercial and general public hunters.

Commercial SRPs for vehicle tours would be unlimited and vehicle use would be unrestricted throughout the uplands. Growth of the commercial vehicle tour industry could lead to increased traffic levels at the expense of semi-primitive motorized opportunities.

Camping Facilities – Recreation development could occur in the uplands if a partnership is developed. Dispersed camping would continue and impacts to soil and vegetation from vehicles and camp activities would occur in relationship to the increase or decrease of visitor use.

With an increase in popularity of the uplands, rock fire rings and scars from fires could be protrusive on an otherwise predominantly primitive landscape.

A full range of signs and kiosks could be constructed at Level 1 sites. Level 2 and 3 sites would be marked and identified with signs. The primitive nature of the uplands may be visually compromised in some areas.

Alternative B

Special Recreation Use Permits – With no limit on the number of commercial SRPs issued for hunting in the uplands, the potential for additional conflicts (beyond current levels) between commercial and general public hunters would exist, especially if there would be a rapid and large increase in commercial use.

Assigning permits to the entire Monument could increase conflicts as any commercial permittee could access any hunting area. There would be potential for a concentrated number of commercial permittees in areas favored by the general public.

Commercial SRPs for vehicle tours and the number of vehicles used would be unlimited, but vehicles associated with the permit would be restricted to mostly local and collector roads. Increased traffic levels on resource roads would not lessen the semi-primitive motorized experience. Traffic may increase on local and collector roads.

Camping Facilities – Level 1 sites could be constructed within the interior of the uplands, but at places where some of level of development has occurred in the past (fishing reservoirs, overlooks or historic sites).

Level 3 sites, where only a metal fire ring is present, would be confined to pull-outs immediately adjacent to a road.

With an increase in popularity of the uplands, rock fire rings and scars from fires could impact an otherwise predominantly primitive landscape.

There would be no restrictions on signs anywhere in the uplands and the primitive nature of the area could be visually compromised if signs were installed along roads or in dispersed areas.

Alternative C

Special Recreation Use Permits – The number of permits issued for outfitted hunting would be limited to the current number. Limiting the number of commercial permittees (operators) decreases the possibility of conflicts with the general public; however, it leaves the opportunity for the commercial permittees (operators) to hire unlimited guides, which could lead to increased conflicts in areas favored by the general public.

Assigning permits to the entire Monument could increase potential conflicts, as any commercial permittee could access any hunting area. This could concentrate a number of commercial permittees in areas favored by the general public.

Commercial SRPs for vehicle tours and the number of vehicles used would be unlimited, but vehicles would be restricted on some resource roads. Semi-primitive motorized opportunities would not decrease on resource roads. Traffic may increase on local and collector roads.

Camping Facilities – Level 1 sites could not be constructed within the interior of the uplands. They could be constructed only along the outside perimeter at the transition point between collector and local/resource roads. There would be no opportunity for visitors seeking a Level 1 site while traveling the uplands. There would be an opportunity for a semi-primitive motorized trip, free from the sight of large-scale development within the uplands.

Level 2 sites could be constructed along any road (collector, local or resource) in the uplands. Level 2 sites would provide access to dispersed and primitive hiking and camping opportunities, but without the large development potential of a Level 1 site. Level 2 sites would blend with the natural surroundings and provide park and explore opportunities. Level 2 sites occurring on local or resource roads could visually detract from the primitive nature of the uplands.

Level 3 sites, where only a metal fire ring is present, would be confined to pull-outs immediately adjacent to a road. A proliferation of campsites with metal fire rings would not occur in the large tracts of land in the uplands.

The use of camp stoves, fire pans, or fire mats would be required for dispersed camping (Level 4 opportunities) would eliminate additional rock fire rings (from current levels) and fire scars from the predominantly primitive landscape.

Signing would be of minimum size and only used at Level 1, 2, or 3 sites. The primitive nature of the uplands may be visually compromised depending on the number of Level 3 sites identified and developed in the future.

Alternative D

Special Recreation Use Permits – With no limit on the number of commercial SRPs issued for hunting in the uplands, the potential for conflicts between commercial and general public hunters would exist, especially if there would be a rapid and large increase of SRP applications.

Issuing permits in areas with limited public access could reduce the potential for conflicts between commercial users and general public users.

Commercial SRPs for vehicle tours would be unlimited, but the number of vehicles allowed each operator per day would be restricted to two. This would minimize the number of potential commercial vehicles traveling through the uplands on any given day.

Camping Facilities – There would be no Level 1 sites in the uplands. This would ensure the primitive nature of the uplands would be maintained, but would eliminate an opportunity for those wishing to camp in a developed site prior to entering the interior core as stated in Alternative C, or within the interior as stated in Alternative B.

Level 2 sites could be constructed only along main artery roads (collector and some local roads). Other local and resource roads would remain in a more primitive state.

Level 3 sites, where only a metal fire ring is present, would be confined to pull-outs immediately adjacent to a road. A proliferation of campsites with metal fire rings would not occur in the large tracts of land in the uplands.

The use of camp stoves, fire pans, or fire mats would be required for dispersed camping (Level 4 opportunities) would eliminate additional rock fire rings and fire scars from the predominantly primitive landscape.

Signing would be restricted to Level 1 and 2 sites commensurate with visual surroundings. There would be no signs at Level 3 sites. There would be reduced opportunities for visual impairment to the primitive nature of the area as compared with Alternatives A, B, and C.

Alternative E

Special Recreation Use Permits – With no limit on the number of commercial SRPs issued for hunting in the uplands, the potential for additional conflicts between commercial and general public hunters would exist, especially if there would be a rapid and large increase of SRP applications.

Issuing permits in areas with public access could increase the potential for conflicts between commercial users and general public users.

There would be no opportunity for commercial vehicle tours. The traffic level in the uplands would not be increased by commercial use.

Camping Facilities – There would be no site development of any type in the uplands. While this would ensure primitive integrity, it would also eliminate all camping opportunities except Level 4 dispersed camping. It would also eliminate the opportunity to educate and inform the

public through interpretive signing associated with Level 1 and Level 2 site developments.

The use of camp stoves, fire pans, or fire mats would be required would eliminate additional rock fire rings and fire scars from the predominantly primitive landscape.

Signing in the uplands would be limited to safety and commensurate with visual surroundings. While this would ensure the visual integrity of the uplands, it would eliminate the use of signs for information and education of visitors.

Alternative F (Preferred Alternative)

Special Recreation Use Permits – The number of permits issued for outfitted hunting would be limited to the current number. Limiting the number of commercial permits does decrease the possibility of conflicts with the general public by limiting the number of operators in the Monument. However, it leaves the opportunity for the commercial permittees to hire unlimited guides, which could lead to increased conflicts in areas favored by the general public.

Assigning the permit to a specific area, based on knowledge of visitor use patterns and numbers, could decrease potential conflicts between commercial and general public hunters.

Commercial permits for vehicle tours would be unlimited, but the number of vehicles allowed each operator per day would be restricted to two. This would minimize the number of potential commercial vehicles traveling through uplands on any given day.

Camping Facilities – Level 1 sites could not be constructed within the interior of the uplands. They could be constructed only along the outside perimeter at the transition point between collector and local/resource roads. There would be no opportunity for visitors seeking a Level 1 site while traveling the uplands. There would be an opportunity for a semi-primitive motorized trip, free from the sight of large-scale development within the uplands.

Level 2 sites could be constructed along any road (collector, local or resource) in the uplands. Level 2 sites would provide access to dispersed and primitive hiking and camping opportunities, but without the large development potential of a Level 1 site. Level 2 sites would blend with the natural surroundings and provide park and explore opportunities. Level 2 sites occurring on local or resource roads may visually detract from the primitive nature of the uplands.

Level 3 sites would be allowed only adjacent to local and collector roads, not resource roads. An exception could occur adjacent to closed spur roads, and then no further than 300 feet from the local or collector road it stems from. These sites would be shown on a map and would present an opportunity for visitors who seek a primitive experience.

The use of camp stoves, fire pans, or fire mats would be required for dispersed camping (Level 4 opportunities) would eliminate additional rock fire rings (from current levels) and fire scars from the predominantly primitive landscape.

Signing would be restricted to Level 1 and Level 2 sites commensurate with visual surroundings. There would be no signs at Level 3 sites. The limited signing would lessen the potential impacts to the visual resource and the primitive nature of the area.

Impacts to Recreation from Natural Gas Exploration and Development

Drilling Operations

Alternative A (Current Management)

The quality of the recreational experience may be reduced by the very presence of a well. Wells, and associated operations, may displace recreation activities to other areas. Activities associated with well development may degrade the experience of hikers or hunters or other visitors seeking a primitive setting free from modern structures and mechanical operations.

Drilling and production activities may temporarily displace hunters during hunting seasons. Hikers may have sight and sound conflicts with drilling activity and may also be temporarily displaced.

The use of vehicles on administrative roads may detract from the primitive experience of hikers. During the hunting season, opportunities would be reduced for hunters seeking a walk-in experience free of motor vehicles.

Alternative B

The potential to reduce the quality of the recreational experience would increase.

Drilling and production activities may temporarily displace hunters during hunting seasons. Hikers may have sight and sound conflicts with drilling activity and may also be temporarily displaced.

The use of vehicles on administrative roads may detract from the primitive experience of hikers. During the hunting season, opportunities would be reduced for hunters seeking a walk-in experience free of motor vehicles.

Alternative C

The quality of the recreational experience may be reduced by the very presence of a well. Wells, and associated operations, may displace recreation activities to other areas. Activities associated with well development may degrade the experience of hikers or hunters or other visitors seeking a primitive setting free from modern structures and mechanical operations.

Drilling and production activities may temporarily displace hunters during hunting seasons. Hikers may have sight and sound conflicts with drilling activity and may also be temporarily displaced.

The vehicle impacts described in Alternatives A and B would remain, but frequency would be reduced.

Alternative D

There would be fewer potential impacts to the recreational experience.

Drilling and production activities may temporarily displace hunters during hunting seasons. Hikers may have sight and sound conflicts with drilling activity and may also be temporarily displaced.

The vehicle impacts described in Alternatives A and B would remain, but frequency would be reduced.

Alternative E

This alternative would produce the fewest potential impacts to the recreational experience.

Drilling and production activities may temporarily displace hunters during hunting seasons. Hikers may have sight and sound conflicts with drilling activity and may also be temporarily displaced.

The vehicle impacts described in Alternatives A and B would remain, but frequency would be reduced.

Alternative F (Preferred Alternative)

The quality of recreation may be reduced by the very presence of a well. Wells, and associated operations, may displace recreation activities to other areas. Activities associated with well development may degrade the experience of hikers or hunters or other visitors seeking a primitive setting free from modern structures and mechanical operations.

Drilling and production activities may temporarily displace hunters from an area during hunting seasons. Hikers may have sight and sound conflicts with drilling activity and may also be temporarily displaced.

The vehicle impacts described in Alternatives A and B would remain, but frequency would be reduced.

Impacts to Recreation from Access and Transportation

Access

Alternative A (Current Management)

Access to public lands could improve, affording greater recreational opportunities for the public.

The general public would have more motorized access to portions of the Monument. This may decrease opportunities for those seeking a more primitive walk-in experience.

Individuals with disabilities could have opportunities for access not granted to the general public.

Alternative B

Gaining access to BLM land could provide additional recreational opportunities. Some of these tracts are utilized by commercial hunting outfitters who, because of access issues, have little interaction with general public hunters.

The general public would have more motorized access to portions of the Monument. This may decrease opportunities for those seeking a more primitive walk-in experience.

Individuals with disabilities could have opportunities for access not granted to the general public.

Alternative C

Gaining access to BLM land could provide recreational opportunities. Some of these tracts are utilized by commercial hunting outfitters who, because of access issues, have little interaction with general public hunters.

There would be fewer opportunities to access new roads with motorized vehicles than in Alternatives A and B. Wilderness study area values sensitive to motorized vehicles would be better protected than in Alternatives A and B.

Individuals with disabilities could have opportunities for access not granted to the general public.

Alternative D

Access to BLM land and associated recreation opportunities would remain at current levels. The general public may continue to express concerns that only commercial hunting outfitters or those with private land access could access certain parts of the Monument.

Potential impacts from motorized vehicles would be analyzed prior to public use of new natural gas access roads. Additional motorized public access could occur after site-specific analysis.

Individuals with disabilities could have opportunities for access not granted to the general public.

Alternative E

Access to BLM land and associated recreation opportunities would remain at current levels. The general public may continue to express concerns that only commercial hunting outfitters or those with private land access could access certain Monument lands.

No additional public access would occur when new natural gas access roads are constructed.

Individuals with disabilities could have opportunities for access not granted to the general public.

Alternative F (Preferred Alternative)

Gaining access to BLM land could provide recreation opportunities. Some of these tracts are utilized by commercial hunting outfitters who, because of access issues, have little interaction with general public hunters.

Additional public access to new natural gas roads could occur after site-specific analysis.

Individuals with disabilities could have opportunities for access not granted to the general public.

BLM Road System

Alternative A (Current Management)

Opportunities for hunters and other visitors to access state land would not change.

The visiting public has motorized access to 97% of current BLM roads at some time during the year. Currently, 12% of the BLM roads are closed seasonally. This level of access certainly benefits those publics who recreate in a motorized vehicle, or use a motorized vehicle to access BLM land. This level of access may be detrimental to those users seeking a more primitive, non-motorized experience.

Opportunities for hunters to experience walk-in hunts without interference of motorized vehicles would be more difficult under this alternative. Opportunities to access backcountry airstrips via road would not be restricted.

Exceptions – Except in the WSAs, hunters would have off-road access with non-motorized/non-mechanized game carts to retrieve tagged big game animals. In the WSAs, game carts would not be allowed off road.

Camping opportunities would be limited to those areas accessible by foot from a designated road.

Signing – Additional new signs may visually detract from primitive nature of the Monument.

Alternative B

Hunters and other visitors would have fewer opportunities to access state land when four roads are closed seasonally leading to state land to protect the objects for which the Monument was designated. This may displace hunters and other visitors and result in a more concentrated number of users on surrounding BLM land.

An additional 40 miles of road would be closed yearlong and 22 miles closed seasonally. This would reduce motorized opportunities, but increase walk-in opportunities. Seasonal closures for bighorn sheep may provide increased hunting opportunities and watchable wildlife viewing opportunities. Road access to backcountry airstrips would be restricted to 10 airstrips.

Additional opportunities for mountain bike use may occur on closed roads.

Road System Criteria – Seasonal road closures to protect wildlife could restrict motorized vehicle access and motorized recreation opportunities.

Exceptions – Hunters would have access on some identified closed roads to retrieve tagged big game animals and, except in the WSAs, would have off-road access with non-motorized, non-mechanized game carts. Access on closed roads during early morning and late evening hours may disrupt the effort of other hunters in the same area. In the WSAs, game carts would not be allowed off road.

Campers could create new tracks up to 300 feet in length to campsites. Additional tracks may also spur off the newly created track leaving a possible spider web of tracks leading to campsites.

Signing – Adding signs, after careful monitoring, would help ensure signing only areas with an established, critical need. Signing only open roads would reduce the number of signs needed.

Alternative C

Hunters and other visitors would have fewer opportunities to access state land when four roads are closed seasonally and one road closed yearlong leading to state land to protect the objects for which the Monument was designated. This may displace hunters and other visitors and result in more concentrated numbers of users on surrounding BLM land.

Access to 69% of the current roads year around would continue to provide opportunities for motorized activities, but at a reduced level compared to Alternatives A and B. Visitor seeking walk-in experiences would have more opportunity than in Alternative A and B. Road access to backcountry airstrips would be restricted to seven airstrips.

Additional opportunities for mountain bike use may occur on closed roads.

Road System Criteria – Seasonal road closures to protect wildlife could restrict motorized vehicle access and motorized recreational opportunities.

Exceptions – Retrieval of a tagged big game animal would be restricted by designating specific hours of availability and specific access roads. Disruption of other hunters would be reduced with the retrieval timeframe of 10:00 a.m. to 2:00 p.m. and 3 hours after the legal hunting time. Except in the WSAs, hunters would have off-road access to tagged animals with non-motorized, non-mechanized game carts. In the WSAs, game carts would not be allowed off road.

Campers could create new tracks up to 150 feet in length to campsites. Additional tracks may also spur off the newly created tracks leaving a possible spider web of tracks leading to campsites.

Signing – Adding signs, after careful monitoring, would help to ensure that only areas with critical needs would be signed. Signing only open roads would reduce the number of signs.

Alternative D

Hunters and other visitors would have fewer opportunities to access state land when four roads are closed seasonally and five roads are closed yearlong leading to state land to protect the objects for which the Monument was designated. This may displace hunters and other visitors and result in more concentrated numbers of users on surrounding BLM land.

Allowing access to 48% of current roads year round would diminish opportunities for motorized travel and access. Resource roads (spur roads) and parallel roads would compose many of the additional closures. Hunters may experience fewer opportunities to access current hunting camps if those camps are located on closed spur roads. Hunters and other visitors seeking a more primitive walk-in experience would have more opportunities than in Alternatives A, B, or C. Road access to backcountry airstrips would be restricted to six airstrips.

Road System Criteria – Seasonal road closures to protect wildlife could restrict motorized vehicle access and motorized recreational opportunities.

Exceptions – Retrieval of a tagged big game animal would be restricted by designating specific hours of availability and specific designated closed roads. Disruption of other hunters would be reduced with the 10:00 a.m. to 2:00 p.m. retrieval timeframe. Except in the WSAs, hunters would have off-road access to retrieve tagged big game animals with non-motorized, non-mechanized game carts. In the WSAs, game carts would not be allowed off road.

Vehicles would not create new tracks by pulling off designated roads no more than 10 feet, but opportunities to camp with a vehicle would increase above those stated in Alternative A.

Signing – Adding signs only after careful monitoring would help to ensure that only areas with critical needs would be signed. Signing only open roads would reduce the number of signs.

Alternative E

Hunters and other visitors would have fewer opportunities to access state land when most roads are closed yearlong leading to state land to protect the objects for which the Monument was designated. This may displace hunters and other visitors and result in more concentrated numbers of users on surrounding BLM land.

Allowing access to only 17% of current roads year round would increase non-motorized opportunities. Major collector roads into the uplands would remain, but most resource roads would be closed. Access to hunting camps on resource roads would be reduced or eliminated. Road access to airstrips would be eliminated. Hunters and visitors seeking a primitive non-motorized experience would have greatly increased opportunities.

Road System Criteria – Seasonal road closures to protect wildlife could restrict motorized vehicle access and motorized recreational opportunities.

Exceptions – There would be no opportunity to retrieve a tagged big game animal with a vehicle from a closed road. Non-motorized/non-mechanized game carts would be allowed on closed roads to retrieve a tagged big game animal,

but game carts would not be allowed off road. Hunters with tagged animals would be required to pack them out to an accessible road.

Camping opportunities would be limited to those areas accessible by foot from a designated road.

Signing – Eliminating signs for open or closed roads would ensure the landscape remains free of visual clutter that could detract from the primitive nature of the Monument. Travelers would have to rely on a map to determine which roads were open or closed.

Alternative F (Preferred Alternative)

Hunters and other visitors would have fewer opportunities to access state land when eight roads are closed seasonally and four roads are closed yearlong leading to state land to protect the objects for which the Monument was designated. This may displace hunters and other visitors and result in more concentrated numbers of visitors on surrounding BLM land.

Allowing access to 64% of current roads would continue to provide opportunities for motorized activities, but at a reduced level compared to Alternative A. Visitors seeking walk-in experiences would have more opportunities.

Additional opportunities for mountain bike use may occur on closed roads.

Road System Criteria – Seasonal road closures to protect wildlife could restrict motorized vehicle access and motorized recreational opportunities.

Exceptions – Retrieval of a tagged big game animal would be restricted by designating specific hours of use and specific designated closed roads. Disruption of other hunters would be reduced with the 10:00 a.m. to 2:00 p.m. retrieval time frame. Except in the WSAs, non-motorized/non-mechanized game carts would be allowed off road to retrieve tagged big game animals. In the WSAs, game carts would not be allowed off road.

Campers could create new tracks up to 300 feet in length in to campsites. Additional roads may also spur off the newly created road leaving a possible spider web of roads leading to campsites.

Signing – Adding signs only after careful monitoring would help to ensure only areas with critical needs would be signed. Signing only open roads would reduce the number of signs.

Aviation

Alternative A (Current Management)

The primitive experience of hikers, hunters, boaters and others recreating in the vicinity of an airstrip may be impacted by the sight and sound of aircraft approaching, landing and taking off from an airstrip. Aircraft can be seen and heard from a much longer distance than other forms of motorized travel. Because of this longer disruption, the primitive nature of the Monument may be disrupted for longer periods than from other forms of motorized use. Depending on frequency of use, the widespread magnitude of disruption to the primitive nature of the Monument from sight and sound of aircraft using 10 airstrips could be considerable.

The primitive experience of hikers, hunters and others may be impacted by the sight and sound of commercial aircraft approaching, landing and taking off from an established airstrip or from remote undeveloped sites.

Alternative B

Disrupting the primitive nature of the Monument from the sight and sound of aircraft could increase given the possibility of additional airstrips.

The primitive experience of hikers, hunters and others may be impacted by the sight and sound of commercial aircraft approaching, landing and taking off from an established airstrip or from remote undeveloped sites.

Alternative C

Disrupting the primitive nature of the Monument from the sight and sound of aircraft may be reduced, especially with the addition of seasonal airstrip restrictions. However, maintaining seven airstrips would leave few opportunities for those wishing a primitive experience free of the sight and sound of aircraft. The frequency of use of each of the strips would determine the magnitude of the impact.

The primitive experience of hikers, hunters, boaters and others recreating in the vicinity of an airstrip may be impacted by the sight and sound of commercial aircraft approaching, landing and taking off from an airstrip. The potential for sight and sound impacts would be less than in Alternatives A and B. However, seven airstrips spaced to accommodate most geographical blocks of the Monument would leave fewer opportunities for those wishing a primitive experience in the uplands free of the sight and sound of aircraft approaching, landing or taking off. The frequency of use of each of the strips would determine the magnitude of the impact.

Alternative D

The impacts from sight and sound of aircraft would be similar to those in Alternative C. There would be a slight reduction of impacts in the geographical region near the Woodhawk airstrip.

The impacts from sight and sound of commercial aircraft would be similar to those in Alternative C. There would be fewer impacts in the geographical region near the specific airstrips not authorized for landing.

Alternative E

All potential impacts to the primitive nature of the Monument from the sight and sound of aircraft would be eliminated. However, all opportunities for aircraft to access the Monument would also be eliminated.

All potential impacts to the primitive nature of the Monument from the sight and sound of commercial aircraft would be eliminated. However, all opportunities for commercial aircraft to access the Monument would also be eliminated.

Alternative F (Preferred Alternative)

Disruption of the primitive nature of the Monument from sight and sound of aircraft may be less than stated in Alternative A, B, and C, especially with the addition of seasonal restrictions. However, six airstrips spaced to accommodate most geographical blocks of the Monument would leave fewer opportunities for those wishing a primitive experience in the uplands free of the sight and sound of aircraft approaching, landing or taking off. The frequency of use of each of the strips would determine the magnitude of the impact.

The impacts from sight and sound of commercial aircraft would be similar to those in Alternative C. There would be fewer impacts in the geographical region near the specific airstrips not authorized for landing.

Summary of Cumulative Impacts to Recreation

Alternative A (Current Management)

Visitors to the UMNWSR and uplands would continue to enjoy mostly unrestricted opportunities to participate in recreation pursuits when and where and how they choose.

Visitors would not be subjected to further recreation use fees than currently charged to camp at the James Kipp Recreation Area.

Should recreational use continue to grow at the assumed rate of 5% per year, sight and sound impacts could elevate on the Missouri River. With increasing use, limited restrictions on that use, and group size unlimited up to 50 people, the opportunity for solitude and a primitive experience could become increasingly rare. Additional facilities may be constructed to accommodate increasing use and resolve user conflicts, further detracting from the primitive nature of the UMNWSR. This would be especially true in the White Cliffs section of the river, which currently has a higher level of development than the other sections.

Motorized use on the UMNWSR would continue as it has for the past 25 years with seasonal restrictions from the Saturday before the observed Memorial Day to the Sunday after Labor Day. As use of the river by floaters increases so may conflicts between the two user groups. There would be no opportunity for a primitive non-motorized experience on the river.

Commercial use of the river would remain at the current level of 23 commercial operators. Without restricting user days, it is possible that commercial use would elevate overall visitor use levels much faster than an increase from the private sector. Uplands SRPs would be unrestricted and should visitor use patterns change or levels of use increase, conflicts between private and commercial users could occur. Vehicle tours of the Monument would be unrestricted, and given a large increase in popularity, the number of vehicles using uplands roads could begin to degrade the semi-primitive nature of the area.

Alternative B

Visitors and commercial operators using the Missouri River and upland areas would have mostly unrestricted freedom to access recreation opportunities and participate in recreation pursuits.

There would be no recreation use fees charged in the Monument.

Should use continue to grow at the assumed rate of 5% per year, sight and sound impacts could elevate on the Missouri River. With increasing use, limited restrictions on that use, and group size unlimited up to 50 people, the opportunity for solitude and a primitive experience could become increasingly rare. Additional facilities may be constructed to accommodate increasing use and resolve user conflicts, further detracting from the primitive nature of the UMNWSR. This would be especially true in the White Cliffs section of the river which currently has a higher level of development than the other sections.

There would be no restrictions on motorized use. With increasing use by floaters, conflicts between boater groups would increase. There would be unlimited opportunity for

access and use of the river by motorized boaters and few opportunities for floaters to experience the primitive nature of the river free from the sight and sound of motorized craft.

There would be no restrictions on commercial SRPs. Based on current increases of use from the commercial sector, there would be greater potential for a rapid increase of visitor use beyond the assumed 5%. Uplands SRPs would be unrestricted and should visitor use patterns change or levels of use increase, conflicts between private and commercial users could occur. Vehicle tours of the Monument would be unrestricted, and given a large increase in popularity, the number of vehicles using uplands roads could begin to degrade the semi-primitive nature of the area.

Alternative C

Visitors to the Missouri River and upland areas of the Monument currently enjoy mostly unrestricted opportunities to participate in recreation pursuits when, where, how and as they choose. Should visitation increase at the assumed level of 5% per year, additional use restrictions as described in this alternative would begin to apply. Boaters on the Missouri River would be encumbered by additional restrictions on motorized watercraft, size of group, campsite selection, and length of stay. Without the option of use allocation, additional restrictions would be needed to provide sustainable visitor opportunities in mostly primitive landscapes.

A fee would be charged to camp overnight in developed recreation sites (Level 1 facilities).

Development along the UMNWSR and in the uplands may increase slightly under this alternative depending on visitation levels. Opportunities for new development along the river would be restricted, but when added to the level of current development, a cumulative impact would occur. The primitive characteristics of specific high use areas, such as Eagle Creek, or high use river sections, such as the White Cliffs section, may be altered by facility development needed to accommodate increases in visitor use.

In the uplands, development could occur in areas where no previous development has ever taken place. Development would be low key, blend with the surrounding environment and enhance visitor opportunities for the uplands.

Alternative D

Visitors to the Missouri River and upland areas of the Monument currently enjoy mostly unrestricted opportunities to participate in recreation pursuits when, where, how and as they choose. Should visitation increase at the assumed level of 5% per year, additional use restrictions would begin to apply. Boaters on the Missouri River would be encumbered by additional restrictions on motorized watercraft, size of group, campsite selection, and length of stay.

Allocating use opportunities would be an option, and additional restrictions could be used to provide sustainable visitor opportunities in mostly primitive landscapes. The freedom to recreate without restriction could be reduced depending on future levels of visitor use.

Motorized use of the river would be restricted to seasonal opportunities at downstream no-wake speeds. There would be no opportunity for operating at plane speed in both directions.

Fees would be charged to camp at Level 1 sites and to boat the Missouri River.

Development along the UMNWSR and in the uplands may increase slightly depending on visitation levels. However it would be less than in Alternatives C and F. The primitive characteristics of specific high use areas, such as Eagle Creek, or high use river sections, such as the White Cliffs section, would not be altered by facility development needed to accommodate increases in visitor use.

Level 1 development in the uplands would remain at the current level. Some new Level 2 development could take place, but at levels reduced from those described in Alternatives C and F.

Alternative E

Visitor use opportunities would be restricted under this alternative. An allocation system would be initiated that may possibly reduce the freedom to access the UMNWSR.

Group size would be limited to 16 people and SRPs would be required for larger groups.

A fee would be charged to camp overnight at Level 1 sites, recreate in the Monument, and boat on the Missouri River.

There would be no facility development beyond current levels along the river or in the uplands.

There would be no motorized use of the UMNWSR, and agency use of motorized watercraft would follow the same restrictions imposed on the public.

Alternative F (Preferred Alternative)

Visitors to the Missouri River and upland areas currently enjoy mostly unrestricted opportunities to participate in recreation pursuits when, where, how and as they choose. Should visitation increase at the assumed level of 5% per year, additional use restrictions would begin to apply. Boaters on the Missouri River would be encumbered by

additional restrictions on motorized water craft, size of group, campsite selection, and length of stay. Without the option of use allocation, additional restrictions would be needed to achieve the goal of providing sustainable visitor opportunities in mostly primitive landscapes.

A fee would be charged to float the river and camp overnight in developed recreation sites (Level 1 facilities).

Development along the UMNWSR and in the uplands may increase slightly depending on visitation levels. Opportunities for new development along the river would be restricted, but when added to the level of current development, a cumulative impact would occur. The primitive characteristics of specific high use areas, such as Eagle Creek, or high use river sections, such as the White Cliffs section, may be altered by facility development needed to accommodate increases in visitor use.

In the uplands, development could occur in areas where no previous development has ever taken place. Development would be low key, blend with the surrounding environment, and enhance visitor opportunities for the uplands.

Transportation

Impacts to Transportation from Access and Transportation

Access

Alternative A (Current Management)

If the BLM would be successful in acquiring new public road easements anywhere in the Monument, it would increase the miles of roads open or open seasonally and available for motorized public travel. There would be no impact to administrative motorized use.

Any new BLM resource roads developed to accommodate natural gas development would provide additional motorized access for the public to travel.

Motorized travel could be allowed on some of the 15 miles of closed BLM roads (segments of 32 individual roads) for individuals with disabilities. This would provide access opportunities not granted to the general public.

Alternative B

If the BLM would be successful in acquiring new public road easements anywhere in the Monument, it would increase the miles of roads open or open seasonally and available for motorized public travel. There would be no impact to administrative motorized use.

Any new BLM resource roads developed to accommodate natural gas development would provide additional motorized access for the public to travel.

Motorized travel could be allowed on some of the 55 miles of closed BLM roads for individuals with disabilities. This would provide access opportunities not granted to the general public.

Alternative C

Attempts to acquire new public access easements for motorized travel would not include the northeast area of the Monument.

General public motorized access along new natural gas roads would be allowed, except in the Ervin Ridge area. This would decrease the number and miles of new BLM resource roads available for motorized public travel.

Motorized travel could be allowed on some of the 93 miles of closed BLM roads for individuals with disabilities. This would provide access opportunities not granted to the general public.

Alternative D

The BLM would not attempt to acquire new or additional public access.

Any new BLM resource roads associated with natural gas activities could potentially be open for motorized travel by the public.

Motorized travel could be allowed on some of the 264 miles of closed BLM roads for individuals with disabilities. This would provide access opportunities not granted to the general public.

Alternative E

The BLM would not attempt to acquire new or additional public access.

Any new BLM resource roads created for natural gas operations would be open for administrative use only and closed to motorized travel by the general public.

Motorized travel could be allowed on some of the 489 miles of closed BLM roads for individuals with disabilities. This would provide access opportunities not granted to the general public.

Alternative F (Preferred Alternative)

If the BLM would be successful in acquiring new public road easements anywhere in the Monument, it would in-

crease the miles of roads open or open seasonally and available for motorized public travel. There would be no impact to administrative motorized use.

Any new BLM resource roads associated with natural gas activities could potentially be open for motorized travel by the public.

Motorized travel could be allowed on some of the 216 miles of closed BLM roads (segments of 341 individual roads) for individuals with disabilities. This would provide access opportunities not granted to the general public. The low anticipated volume of traffic should have no impact to the BLM transportation system or the objects of the Monument.

BLM Road System

Alternative A (Current Management)

All existing BLM roads to state land would be open yearlong for administrative, private landowner and public use with motorized vehicles. There would be 37 miles (on 38 individual BLM roads) that would provide motorized access to 40 of the 45 state land parcels intermingled with the Monument. Nine of these roads provide legal motorized public access.

All existing BLM roads to private land would be open yearlong for administrative, private landowner and public use. There are 36 miles (on 34 individual BLM roads) providing motorized access to 34 of the 40 tracts of private land intermingled with the Monument. Sixteen miles of BLM roads extending beyond state and private land would be open for public motorized travel.

Under this alternative, 506 miles of BLM roads would be open yearlong for public motorized and mechanized travel (including portions of 442 individual BLM roads). These roads access 14 natural gas wells, 10 backcountry airstrips, 5 range improvement water wells, 6 recreation sites including 1 fishing reservoir, 3 interpretive sites (historic homesteads), 1 Bodmer landscape site, 6 WSAs, and provide access associated with dispersed motorized use.

Seventy-three miles of BLM roads would be open seasonally to public motorized and mechanized travel. This would include portions of 58 individual BLM roads.

There would be 15 miles of BLM roads closed yearlong to public motorized access. This would include 14 miles (portions of 31 roads) within the Woodhawk and Two Calf watersheds to provide wildlife habitat security; and 1 mile (1 road) near the Gist historic homestead.

Road System Criteria – In the six WSAs, 56 miles of vehicle ways (authorized roads) would remain open to public motorized travel. This would include portions of 65 individual vehicle ways.

Road Classification and Maintenance – The BLM roads would fall into the classification shown in Table 4.25.

The BLM roads would fall into the maintenance levels shown in Table 4.26.

Table 4.25
BLM Road Classification
Alternatives A (Current Management), C, D, and E

Classification	*Miles of Road*	*Number of Roads*	*Percent of Road System*
Collector	18	2	3%
Local	31	4	5%
Resource	545	526	92%
Total	594	532	100%

Table 4.26
BLM Road Maintenance – Alternative A (Current Management)

Maintenance Level	*Miles of BLM Road*	*Number of Roads and Classification*	*Percent of Road System*
Level 1	15 Miles	32 Resource Roads	3%
Level 2	505 Miles	486 Resource Roads	85%
Level 3	8 Miles 56 Miles	1 Collector Road (Knox Ridge) 4 Local Roads and 8 Resource Roads	11%
Level 4	10 Miles	1 Collector Road (Cow Island)	1%

Exceptions – Administrative motorized use by BLM, other federal agencies, state and county agencies, lessees and permittees could occur on 15 miles of roads closed yearlong (portions of 32 BLM roads). If a road segment provides access to a facility and becomes impassable, spot maintenance could be authorized on a case-by-case basis.

Administrative cross-country motorized travel in the Monument would be allowed yearlong.

Big game retrieval would not be allowed along 15 miles of resource roads that would be closed yearlong.

Motorized vehicles traveling the BLM roads designated as open yearlong or open seasonally would not be allowed to pull off the shoulder of the road to park and camp in the Monument. This would impact 579 miles along 500 BLM roads.

Alternative B

All BLM roads to state and private land would be open yearlong for administrative travel and private landowner use. Public use of these routes would be allowed either yearlong or seasonally and would include 73 miles of BLM roads (portions of 72 roads). There would be 16 miles of BLM resource roads that extend beyond state land closed yearlong to motorized public travel. This would include portions of 38 roads. There would also be 6 miles of BLM roads that extend beyond private land closed yearlong to motorized public travel which would include portions of 11 roads.

There would be 444 miles of BLM roads (75% of the current road system) open yearlong for motorized public travel, which would include portions of 431 roads.

This would be a decrease of 62 miles of BLM roads available for public motorized use yearlong, which would include portions of 11 roads.

There would be 95 miles of BLM roads open seasonally for public motorized travel.

- Includes portions of 62 roads
- 34 miles of 11 roads closed from 4/1-6/15 to protect bighorn sheep lambing areas
- 9 miles of three roads closed from 12/1-4/15 in the Woodhawk Bottom Recreation Area
- 52 miles of 48 roads closed from 9/1-12/1 in the Two-Calf and Woodhawk watersheds

Overall, this alternative would place an additional 22 miles under a seasonal restriction.

There would be 55 miles of BLM roads closed yearlong to motorized public travel.

- Includes portions of 39 roads
- An increase of 40 miles closed yearlong
- Portions of the roads could be designated for mechanized use (mountain bikes)

Road System Criteria – Fifty-six miles of vehicle ways (authorized roads) would remain open to public motorized travel in the six WSAs. This would include portions of 65 individual vehicle ways

Road Classification and Maintenance – The BLM roads would fall into the classification shown in Table 4.27.

The BLM roads would fall into the maintenance levels shown in Table 4.28.

Cattleguards would be installed as needed, along any of the 444 miles of BLM roads that would be open yearlong.

The 55 miles of closed BLM roads would be allowed to reclaim naturally.

Exceptions – Administrative motorized use could occur on 55 miles of BLM roads closed yearlong (portions of 39 roads). If a segment on these closed roads provides access to a facility and becomes impassable, spot maintenance could be authorized on a case-by-case basis.

Administrative cross-country motorized travel in the Monument would be allowed yearlong.

Table 4.27
BLM Road Classification – Alternative B

Classification	*Miles of Road*	*Number of Roads*	*Percent of Road System*
Collector	18	2	3%
Local	31	4	5%
Resource	545	526	92%
Total	594	532	100%

Table 4.28 BLM Road Maintenance – Alternative B			
Maintenance Level	***Miles of BLM Road***	***Number of Roads and Classification***	***Percent of Road System***
Level 1	55 Miles	39 Resource Roads	10%
Level 2	465 Miles	479 Resource Roads	78%
Level 3	8 Miles 56 Miles	1 Collector Road (Knox Ridge) 4 Local Roads and 8 Resource Roads	11%
Level 4	10 Miles	1 Collector Road (Cow Island)	1%

Motorized vehicles traveling the BLM roads that are open yearlong or open seasonally would be allowed to drive 300 feet off the roads to park and camp in the Monument. This would impact 539 miles along 493 BLM roads.

Alternative C

All BLM roads to state and private land (73 miles on 72 roads) would be open yearlong for administrative travel and private landowner use. Public use of these routes would be either yearlong or open seasonally. Sixteen miles of BLM resource roads that extend beyond various state land sections would be closed yearlong to motorized public travel. This would include portions of 38 roads. There would also be six miles of BLM resource roads would extend beyond various private land tracts, and would be closed yearlong to motorized public travel. This would impact portions of 11 roads.

There would be 407 miles of BLM roads open yearlong for public motorized and mechanized travel.

- Includes portions of 324 individual roads
- 69% of the existing road system.
- 99 fewer miles available than current management
- Includes 7 miles (portions of 10 of vehicle ways) in four WSAs

This would be a decrease of 99 miles available for motorized public use or a new restriction/limitation on 118 BLM roads and includes 7 miles on 10 BLM resource roads (vehicle ways) in four WSAs. Two miles on two BLM resource roads that provide motorized access to three backcountry airstrips would be closed.

There would be 94 miles of BLM roads open seasonally for motorized and mechanized public use, including portions of 64 roads. This would be a 21 mile increase (portions of six roads) from current management.

There would be 93 miles of BLM roads closed yearlong to motorized public travel (including portions of 44 roads). These roads could be designated for mechanized (mountain bike) travel.

Road System Criteria – Six miles of BLM vehicle ways in four WSAs (Dog Creek South, Stafford, Ervin Ridge and Cow Creek) have reclaimed naturally and would be closed to public motorized travel.

There would be no impact to greater sage-grouse habitat, designated sensitive species or active bald eagle nests from the BLM road system.

There would be 51 BLM resource roads open seasonally, from April 1 through November 30, in big game winter range. This would include 50 two-track roads and 1 single lane road.

Seven BLM resource roads would be open seasonally, from June 16 through March 31, in bighorn sheep lambing areas.

Temporary road closures could occur on any segment of BLM resource roads (526 roads) in highly infested invasive weed areas.

Road Classification and Maintenance – The road classifications for the BLM transportation system would remain the same as Alternative A (Table 4.25).

The BLM roads would fall into the maintenance levels shown in Table 4.29.

Cattleguards would be installed as needed along any of the 407 miles of BLM roads that would be open yearlong.

The 93 miles of closed BLM roads either would be allowed to reclaim naturally or selected segments of these 44 closed roads could require ripping, scarifying and seeding with a native mixture to accomplish reclamation efforts. The Monument manager could approve a different seed mixture.

Table 4.29 BLM Road Maintenance – Alternative C			
Maintenance Level	***Miles of BLM Road***	***Number of Roads and Classification***	***Percent of Road System***
Level 1	93 Miles	44 Resource Roads	16%
Level 2	427 Miles	474 Resource Roads	72%
Level 3	8 Miles 56 Miles	1 Collector Road (Knox Ridge) 4 Local Roads and 8 Resource Roads	11%
Level 4	10 Miles	1 Collector Road (Cow Island)	1%

Exceptions – Administrative motorized use could occur on 93 miles of closed roads yearlong. If a segment on these closed roads provides access to a facility and becomes impassable, spot maintenance could be authorized on a case-by-case basis.

Administrative cross-country motorized travel in the Monument would be allowed yearlong.

Big game retrieval would be allowed on 31 miles of BLM resource roads.

- Allowed between 10 a.m. and 2 p.m. and for 3 hours after sunset
- Allowed September 1 through December 1
- Includes portions of 44 BLM resource roads

Motorized vehicles traveling the BLM roads designated either open yearlong or open seasonally would be allowed to drive 150 feet off the road to park and camp in the Monument. This would impact 501 miles along 388 BLM roads.

Alternative D

All BLM roads to state and private land would be open yearlong for administrative travel and private landowner use.
Public use of these routes would be allowed yearlong or seasonally. This would involve 73 miles on 72 individual roads. BLM resource roads that extend beyond state land would be closed yearlong to motorized public travel. This would involve 16 miles on 38 individual roads. Also, BLM resource roads that extend beyond private tracts would be closed yearlong to motorized public travel. This would involve 6 miles and 11 individual roads.

There would be 287 miles of BLM roads would be open yearlong for public motorized travel.

- Includes 221 individual roads
- 48% of the existing road network
- Would be 219 fewer miles (portions of 221 roads) available for motorized public use

There would be 43 miles of BLM roads open seasonally to public motorized travel (from 64 individual roads).

There would be 264 miles of BLM roads closed yearlong to motorized public travel.

- Would involve 247 individual roads
- Would be 249 fewer miles (portions of 215 roads) available to motorized public use
- Includes 135 miles (portions of 146 roads) that either parallel an adjacent road or are short spur (one-way) roads

Some of the 594 miles of BLM roads could be designated for travel only by specific motorized vehicles (ATVs, motorbikes, four-wheel drives or snowmobiles) or only for mechanized use (mountain bikes).

Road System Criteria – The 56 miles of vehicle ways in the six WSAs would be closed to all public motorized travel.

Three BLM resource roads would be open seasonally, from March 16 through November 30, in greater sage-grouse habitat. This would include 2 two-track roads and 1 single-lane road.

Fifty-one BLM resource roads would be open seasonally, from May 16 through November 30, in big game winter range. This would be an additional 45 days these roads would be closed to public travel.

Seven BLM resource roads would be open to public motorized use seasonally, from June 16 through March 31, in bighorn sheep lambing areas.

Temporary road closures could occur on any segment of BLM resource roads (526 individual roads) to help reduce the spread of invasive weeds. Temporary closures could

also occur in any segment of the 31 miles of local roads (from four individual roads) for the same reason.

Road Classification and Maintenance – The road classifications for the BLM transportation system would remain the same as Alternative A (Table 4.25).

The BLM roads would fall into the maintenance levels shown in Table 4.30.

Cattleguards could be installed as needed, along any of the 287 miles of BLM roads that would be open yearlong.

The 264 miles of closed BLM roads would be reclaimed under site-specific reclamation plans that may require ripping, scarifying, and seeding with a native mixture to meet reclamation standards for the Monument. The Monument manager could approve a different seed mixture.

Exceptions – Administrative motorized use by the BLM, other federal agencies, and state and county agencies would be allowed on the 220 miles of BLM roads closed yearlong (portions of 247 individual roads). If a segment on these roads provides access to a facility and becomes impassable, spot maintenance could be authorized on a case-by-case basis. There could be some surface disturbance from road repair.

Cross-country travel in the Monument would be allowed yearlong for the BLM, other federal agencies, state and county agencies. Administrative cross-country motorized travel and travel on closed roads by lessees and permittees would comply with wildlife seasonal closures in effect for these closed roads.

Big game retrieval would be allowed on some BLM roads.

- Includes 50 miles
- Includes portions of 32 individual roads
- Allowed between 10 a.m. and 2 p.m.

Motorized vehicles traveling the BLM roads designated either open yearlong or open seasonally would be allowed to drive only 10 feet off the road to park the vehicle and camp in the Monument. This would impact 330 miles along 285 BLM roads.

Alternative E

All BLM roads to state and private land would be open yearlong for administrative travel and private landowner use. This would involve 73 miles on 72 individual roads. Public use of these routes would be allowed either yearlong or seasonally. BLM resource roads that extend beyond state land would be closed yearlong to motorized public travel. This would involve 16 miles on 38 individual roads. Also, BLM roads that extend beyond private tracts would also be closed yearlong to motorized public travel. This would involve 6 miles on 11 individual roads.

There would be 101 miles of BLM roads open yearlong for public motorized travel.

- Involves 30 individual roads
- 20% of current management
- Includes 2 collector roads (18 miles)
- Includes 4 local roads (31 miles)
- Includes 24 resource roads (52 miles)
- A 405 mile reduction (portions of 301 roads) from current management

Four miles of BLM roads would be open seasonally for public motorized travel (portions of 3 BLM roads).

There would 489 miles of BLM roads (including 499 individual roads) closed yearlong to motorized public travel. This would be an increase of 474 miles of closed roads from current management.

Some of the 594 miles of BLM roads could be designated for travel only by specific motorized vehicles (ATVs, motorbikes, four-wheel drives, snowmobiles) or only for mechanized use (mountain bikes).

Table 4.30
BLM Road Maintenance – Alternative D

Maintenance Level	*Miles of BLM Road*	*Number of Roads and Classification*	*Percent of Road System*
Level 1	264 Miles	220 Resource Roads	45%
Level 2	256 Miles	268 Resource Roads	43%
Level 3	8 Miles 56 Miles	1 Collector Road (Knox Ridge) 4 Local Roads and 8 Resource Roads	11%
Level 4	10 Miles	1 Collector Road (Cow Island)	1%

Road System Criteria – The 56 miles of vehicle ways in the WSAs (portions of 65 vehicle ways) would be closed to motorized public travel.

Six miles of BLM roads would be open seasonally, from March 16 to November 30, in greater sage-grouse habitat. This would include portions of 3 BLM resource roads.

There would be 51 BLM resource roads open seasonally, from May 16 through November 30, in big game winter range. This would mean an additional 45 days these roads are closed to public travel.

Seven BLM resource roads would be open seasonally, from June 16 through March 31, in bighorn sheep lambing areas.

Temporary road closures could occur on any segment of BLM resource roads and the 31 miles BLM local roads in highly infested invasive weed areas.

Road Classification and Maintenance – The road classifications for the BLM transportation system would remain the same as under Alternative A (Table 4.25).

The BLM roads would fall into the maintenance levels shown in Table 4.31.

Cattleguards would be installed as needed along any of the 101 miles of BLM roads that are open yearlong.

The 489 miles of closed BLM roads would be reclaimed under site-specific reclamation plans that may require ripping, scarifying and seeding with a native mixture. The Monument manager could approve a different seed mixture to meet reclamation standards.

Exceptions – Administrative motorized use by the BLM, other federal agencies, and state and county agencies would be allowed on the 489 miles of BLM roads (portions of the 499 roads) closed yearlong. Lessees and permittees would need to obtain permission from the BLM to use these closed roads.

The BLM, other federal agencies, state and county agencies would not be allowed to travel off road (cross country). Lessees and permittees would be need to obtain permission form the BLM to travel cross country.

Big game retrieval would not be allowed on closed roads.

Motorized vehicles traveling the BLM roads designated either open yearlong or open seasonally would not be allowed to pull off the shoulder of the road to park and camp in the Monument. This would impact 105 miles along 33 BLM roads.

Alternative F (Preferred Alternative)

Seventy-three miles of BLM roads (12% of the road network) provide motorized administrative access to the state and private land tracts intermingled with the Monument. Of this, 15 miles on nine BLM roads provide legal motorized public access. The remaining 58 miles require the public to obtain private landowner permission to travel on these state or private land. Some of the BLM resource roads beyond these state or private tracts would be closed to motorized use by the general public to protect wildlife values and reduce soil erosion.

Motorized vehicle travel would occur on 207 miles of BLM roads open to public motorized or mechanized travel yearlong.

- Includes 96 individual roads
- 41% of current management
- A reduction of 299 miles (portions of 346 roads) available for public motorized travel

Motorized vehicular or mechanized travel would also occur on another 171 miles of BLM roads open seasonally to protect Monument values. This would include 95 individual roads.

An estimated 216 miles of BLM roads would be closed to motorized and mechanized public travel throughout the year.

Table 4.31
BLM Road Maintenance – Alternative E

Maintenance Level	*Miles of BLM Road*	*Number of Roads and Classification*	*Percent of Road System*
Level 1	489 Miles	499 Resource Roads	83%
Level 2	31 Miles	19 Resource Roads	5%
Level 3	8 Miles 56 Miles	1 Collector Road (Knox Ridge) 4 Local Roads and 8 Resource Roads	11%
Level 4	10 Miles	1 Collector Road (Cow Island)	1%

- Includes 341 individual roads
- Would reduce by 35% (or 201 miles) the roads available for public motorized use
- Most of these closed roads (183) are short spurs less than 1/2 mile in length or are parallel/redundant (51) roads.

Portions of the 216 miles of BLM closed roads could be designated for travel only by mechanized use (mountain bikes). This would be a significant increase in miles available only for mechanized use on BLM roads and would be a positive impact for this type of recreational non-motorized activity.

Road System Criteria – The six miles on 12 vehicle ways in four WSAs (Dog Creek South, Stafford, Ervin Ridge, and Cow Creek) that have reclaimed naturally would be closed yearlong to public motorized travel. Eight miles of vehicle ways (portions of 27 ways) in five WSAs would be closed yearlong to comply with wildlife objectives. Two miles of vehicle ways (portions of 11 ways) in three WSAs would be open seasonally to comply with wildlife objectives. Forty miles of vehicle ways would remain open to public motorized travel yearlong. This alternative would decrease by 25% the miles of vehicle ways in the six WSAs available for motorized public travel.

Six miles of BLM resource roads in Phillips County would be open seasonally, from April 1 through November 30, in greater sage-grouse habitat. This would include 3 resource roads.

There would be 51 BLM resource roads open seasonally, from April 1 through November 30, in big game winter range. This would include 50 two-track roads and 1 single-lane road.

Seven BLM resource roads would be open seasonally, from June 16 through March 31, in bighorn sheep lambing areas. This would include 6 two-track roads and 1single-lane road.

Temporary road closures could occur on any segment of BLM resource roads in highly infested invasive weed areas.

Road Classification and Maintenance – The BLM roads would fall into the classification shown in Table 4.32.

The BLM roads would fall into the maintenance levels shown in Table 4.33.

Cattleguards could be installed as needed along any of the 207 miles of BLM roads that would be open yearlong.

Table 4.32
BLM Road Classification – Alternative F (Preferred Alternative)

Classification	*Miles of Road*	*Number of Roads*	*Percent of Road System*
Collector	21	4	4%
Local	40	6	7%
Resource	533	522	89%
Total	594	532	100%

Table 4.33
BLM Road Maintenance – Alternative F (Preferred Alternative)

Maintenance Level	*Miles of BLM Road*	*Number of Roads and Classification*	*Percent of Road System*
Level 1	216 Miles	341 Resource Roads	36%
Level 2	4 Miles	2 Local Roads (Woodhawk Bottom and Woodhawk Trail)	53%
	310 Miles	179 Resource Roads	
Level 3	8 Miles	2 Collector Roads (Knox Ridge and Timber Ridge)	9%
	36 Miles	4 Local Roads (Bullwhacker, Middle Two Calf, Lower Two Calf, Wood Bottom)	
	7 Miles	2 Resource Roads (Spencer Cow Camp and Butch Camp	
Level 4	13 Miles	2 Collector Roads (Cow Island and Kipp)	2%

The 216 miles of closed BLM roads would either be allowed to reclaim naturally or selected segments of these 341 closed roads may require ripping, scarifying and seeding with a native mixture. The Monument manager could approve a different seed mixture to meet reclamation standards.

Exceptions – Administrative motorized use by the BLM, other federal agencies, state, county agencies, lessees and permittees would be allowed on the BLM roads closed yearlong (216 miles on portions of 341 BLM roads). If a segment of these closed roads provides access to a facility and becomes impassable, spot maintenance could be authorized on a case-by-case basis. There could be some new surface disturbance from road repair activities.

Administrative cross-country motorized travel would be allowed where necessary to administer the authorized permit. Any impacts associated with administrative travel would be limited to the permitted use area.

Big game retrieval would be allowed on about 50 miles of closed BLM roads.

- Allowed from 10 a.m. to 2 p.m.
- Allowed from September 1 through December 1
- Includes portions of 32 BLM roads

Motorized vehicles traveling along the estimated 378 miles of BLM roads that are open yearlong or open seasonally would be allowed to drive and park the vehicle 300 feet off the road to camp in the Monument. This would involve portions of 191 roads.

Motorized vehicles used for camping along the BLM vehicle ways within the six WSAs would be allowed to parallel park on these routes.

Aviation

Alternative A (Current Management)

The ten primitive, backcountry (primitive) grass landing strips located in the Monument would be available for aircraft and helicopter use throughout the year. No annual maintenance projects or safety work would be scheduled for the primitive airstrips.

The use of the airstrips would provide opportunities for recreational backcountry activities such as camping at undeveloped sites, hiking and sightseeing. Some aircraft activity could also occur during the hunting season.

These backcountry airstrips facilitate another mode of transportation where the visitor would not need a road or require public access to reach the BLM land.

The sounds associated with planes and helicopters landing and taking off may impact the solitude in that immediate area for a short duration.

Permitted commercially operated scenic flight tours using planes, helicopters, hot air balloons, or ultralights could be allowed to land in the Monument, including the 10 backcountry airstrips, as a part of their operation plan activity.

Alternative B

The ten identified existing backcountry airstrips would remain open for aircraft and helicopter operations yearlong under formal BLM right-of-way procedures. The BLM could provide additional primitive grass airstrips in the Monument if a NEPA analysis indicates a need for that type of infrastructure.

Permitted commercially operated scenic flight tours using aircraft, helicopters, hot air balloons, or ultralights could be allowed to land in the Monument, including the 10 backcountry airstrips, as a part of their operation plan activity.

Alternative C

Seven existing landing strips would remain open in the Monument. These airstrips would be identified on the Montana Aeronautical Chart.

The Cow Creek and Knox Ridge primitive airstrips would be open for aircraft use yearlong.

The use of three backcountry landing strips (Left Coulee, Bullwhacker, and Black Butte North) would be allowed seasonally, from April 1 to November 30, to comply with big game winter range wildlife habitat requirements.

The use of the Ervin Ridge and Woodhawk landing strips would be allowed seasonally, from June 16 to November 30, to comply with big game winter habitat and bighorn sheep lambing area restrictions.

The three remaining landing strips (Roadside, Log Cabin, and Black Butte South) would be closed to aircraft and marked with the international Federal Aviation Administration (FAA) symbol to prevent any accidental landings. These airstrips would be allowed to reclaim naturally.

Aircraft use could either be less or more concentrated on fewer landing strips in the Monument.

Maintenance agreements with user groups could be implemented to conduct minimal work to meet aeronautical safety standards for backcountry landing strips. Any sur-

face-disturbing activity would be done by hand to meet the light on the land criteria.

Permitted commercially operated scenic flight tours using aircraft, helicopters, hot air balloons, or ultralights could be allowed to land or take off only from the seven primitive landing strips in the Monument as a part of their operation plan activity. Additional seasonal restrictions may apply to the commercial use of these seven backcountry airstrips.

Alternative D

Six primitive grass landing strips would remain open and listed on the Montana Aeronautical Chart.

The Cow Creek and Knox Ridge backcountry airstrips would be open for aircraft use yearlong.

The use of three primitive landing strips (Left Coulee, Bullwhacker, and Black Butte North) would be allowed seasonally, from April 1 to November 30, to comply with big game winter range wildlife habitat requirements.

The use of the Ervin Ridge landing strip would only be allowed from June 16 to November 30, to comply with big game winter habitat and bighorn sheep lambing area restrictions.

The four remaining airstrips (Roadside, Log Cabin, and Black Butte South on the north side of the river and Woodhawk on the south side of the river) would be closed to aircraft and marked with the international FAA symbol to prevent any accidental landings. These four airstrips would be allowed to reclaim naturally.

There would be four fewer primitive landing strips available for occasional aircraft use which could concentrate more aircraft use on fewer landing strips.

Permitted commercially operated scenic flight tours using planes, helicopters, hot air balloons or ultralights would be required to land or take off only from certain designated landing areas. Not all of the six backcountry airstrips would be available for these commercial activities. Additional seasonal restrictions may apply to commercial use on some of these six backcountry airstrips.

Alternative E

No primitive grass landing strips would allowed in the Monument. All 10 existing backcountry airstrips would be closed. These would be marked with the international FAA closed symbol and allowed to reclaim naturally.

No commercially operated scenic flight tours using planes, helicopters, hot air balloons or ultralights would be allowed to use these landing strips.

Alternative F (Preferred Alternative)

Six backcountry airstrips would remain open and listed on the Montana Aeronautical Chart. The Cow Creek and Knox Ridge primitive airstrips would be open for aircraft use yearlong.

The use of three primitive landing strips (Left Coulee, Bullwhacker, and Black Butte North) would be allowed seasonally, from April 1 to November 30, to comply with big game winter range wildlife habitat requirements.

The use of the Ervin Ridge landing strip would be allowed seasonally, from June 16 to November 30, to comply with big game winter habitat and bighorn sheep lambing area restrictions.

The four remaining airstrips (Roadside, Log Cabin, and Black Butte South on the north side of the river and Woodhawk on the south side of the river) would be closed to aircraft and marked with the international FAA symbol to prevent any accidental landings. These four landing strips would be allowed to reclaim naturally.

Aircraft use could either be less or more concentrated on fewer landing strips in the Monument.

Some of the airstrips could be used as trailheads for hiking trail systems to various segments of the Monument.

This alternative would allow occasional small plane use to access the Monument.

Permitted commercially operated scenic flight tours using planes, helicopters, hot air balloons or ultralights would be required to land or take off only from certain designated landing areas. Not all six of the backcountry landing strips would be available for these commercial activities. Additional seasonal restrictions may apply to commercial use on some of these six backcountry airstrips.

Summary of Cumulative Impacts to Transportation

Alternative A (Current Management)

An estimated 579 miles (97% of the current transportation network) would remain open for motorized public travel. No additional roads would be available for public use, nor would cross-country (off-road) travel be permitted unless authorized on a case-by-case basis for administrative activities.

Fifteen miles (32 BLM roads) would be designated closed to public motorized travel.

Increased motorized travel volume would be anticipated with increased recreation visits.

The current high road density or low spatial landscape ratio for BLM roads in the Monument would remain. About 90% of the Monument is within 1 mile of an open BLM road (yearlong or seasonally) with .99 miles per square mile.

There would be no change in the density, both miles (73) and number (72) of BLM roads that provide access to state land or private land, nor would there be any change in the current spatial landscape (the number of acres between roads) in the Monument. Motorized travel on the BLM roads that beyond private land would be allowed to continue at the discretion of the landowner.

The 65 vehicle ways (56 miles of open roads) in the six WSAs would continue to be available for any type of motorized travel throughout the year.

Aircraft use on the 10 backcountry airstrips could increase without any constraints.

Alternative B

There would be 12% fewer miles of BLM roads available for public motorized travel yearlong. This open category would account for 75% of the Monument transportation plan.

The number of roads within 1 mile of BLM land would remain about the same (86%), as would the spatial landscape ratio. About 88% of the Monument would be within 1 mile of an open BLM road (yearlong or seasonally) with .92 miles per square mile.

The number of vehicle ways open in the WSAs would remain the same.

The BLM would allow use of the 10 backcountry airstrips.

Alternative C

There would be 20% fewer miles of BLM roads available for motorized public travel yearlong. This open category would account for 69% of the Monument transportation plan. The closed BLM roads would increase from 8% (32 roads) to 11% (44 roads), a difference of 12 roads.

There would be 18% fewer miles of vehicle ways open in the WSAs.

The BLM would allow use of seven backcountry airstrips, a 30% decrease from the existing situation.

About 85% of the Monument would be within 1 mile of an open BLM road (yearlong or seasonally) with .86 miles per square mile.

Alternative D

There would be 43% fewer miles of BLM roads available for motorized public travel yearlong. This open category would account for 48% of the Monument transportation plan. The closed BLM roads would increase from 8% (32 roads) to 59% (247 roads), a difference of 215 roads.

The number of roads within 1 mile of BLM land would decrease and the spatial landscape ratio would increase. About 76% of the Monument would be within 1 mile of an open BLM road (yearlong or seasonally) with .56 miles per square mile.

All 65 vehicle ways (100%) in the six WSAs would be closed to motorized vehicle traffic.

The BLM would allow the use and the maintenance of six backcountry landing strips, a 40% decrease from the existing situation. Only two of the landing strips, Cow Creek and Knox Ridge, would be available for yearlong activity. Four backcountry airstrips would be closed permanently. Although there would be fewer landing strips in use, yearly aircraft activity could increase on the remaining six airstrips.

Alternative E

There would be 80% fewer miles of BLM roads available for motorized public travel yearlong. This open category would account for 17% (a decrease of 301 roads) of the Monument transportation plan. The closed BLM roads would increase from 8% (32 roads) to 92% (388 roads), a difference of 356 roads unavailable for public motorized travel.

The number of roads within 1 mile of BLM land would decrease to its lowest level and the spatial landscape ratio would increase to its highest level. About 31% of the Monument would be within 1 mile of an open BLM road (yearlong or seasonally) with .18 miles per square mile.

There would be no public motorized travel on the vehicle ways in the six WSAs. Non-motorized activities could increase in the WSAs.

The 10 backcountry landing strips would be closed.

Alternative F (Preferred Alternative)

There would be 59% fewer miles of BLM roads available for motorized public travel yearlong. This open category

would account for 35% of the miles (a decrease of 301 roads) of the Monument transportation plan. Conversely, 36% of the miles would be closed yearlong to public travel by motorized vehicles.

The density, in both miles and number of BLM roads, would be less than currently exists in the Monument. This represents a change from 506 miles (96%) on 500 BLM roads to 207 miles on 191 designated BLM roads that would be open to motorized vehicle traffic sometime during the year.

There could be a decrease in traffic volume on these roads associated with motorized travel by the general public.

The spatial landscape ratio (the number of acres between BLM road systems) would increase accordingly with the decrease in the roads. About 90% of the Monument would within 1 mile of an open BLM road (yearlong or seasonally) with .65 miles per square mile.

There would be less potential for the spread of noxious weeds by motorized vehicle traffic with fewer roads.

Fewer roads would be available for recreationists, including those hunters who use motorized travel to conduct their hunting activities in the Monument.

There would be no change in the density (73 miles and 72 BLM roads) or spatial landscape values for motorized travel to state and private land intermingled with the Monument. The use of the roads that extend beyond the state or private land intermingled with the Monument would also decrease as 16 miles on 38 BLM roads would be closed to the public.

There would be fewer miles (25%) and fewer vehicle ways (60%) available for public motorized traffic in the WSAs yearlong. This would improve the solitude and primitive wilderness values for the six WSAs.

The BLM would allow the recreational use by aircraft and the maintenance of six backcountry airstrips. Only two of the landing strips, Cow Creek and Knox Ridge, would be available for yearlong activity. Four backcountry airstrips would be closed permanently. Although there would be fewer landing strips in use, yearly aircraft activity may increase on the remaining six airstrips. Backcountry pilots would be able to utilize aircraft to recreate in portions of the Monument. Some of the open airstrips could be used as trailheads for hiking trail systems to various segments of the Monument.

Fire

Impacts to Fire from Health of the Land and Fire

Prescribed Fire

Alternative A (Current Management)

Restrictions on surface disturbance in sage-grouse crucial winter habitat (December 15-May 15) could affect the BLM's ability to carry out prescribed fire projects during the most advantageous time of year. This involves 6,866 acres of winter habitat. Surface-disturbing activities for special status raptors would require mitigation of impacts in order to carry out prescribed fire activities within the area of concern.

Under current watershed plans in the Monument (Armells, Upper Missouri, Arrow Creek and the Monument portion of the Bears Paw to Breaks) there are approximately 35,000 acres of possible prescribed fire projects. Assuming adequate burn windows, budget and personnel, over a 10-year period the BLM would expect completion of approximately 3,500 acres of prescribed fire per year.

Fire Management Units (FMUs)

In the Wild and Scenic River and Wilderness Study Areas FMUs, prescribed fire use would be limited to those projects that protect public safety and protect resource values.

In the North Monument and South Monument FMUs, prescribed fire use would be limited to those projects that protect public safety and protect resource values or achieve resource objectives.

Alternative B

Mitigating surface-disturbing activities near special status raptors would impact prescribed fire activities.

Establishing resource reserve allotments would increase opportunities for prescribed burn projects by allowing another option for grazing during the rest cycle following the burn.

This alternative would allow prescribed fire only in the Wilderness Study Areas FMU. The number and size of the potential prescribed fire projects would depend on ecological need to introduce fire. Fire Regime Condition Class (FRCC) surveys would tell how many acres may be out of the historic fire interval and the risk of losing key components of the ecosystem to wildland fire. For example, if out of 90,000 acres, 30,000 acres are in FRCC class 2 and 3 (class 1 is optimal), the BLM would consider returning that

30,000 acres to Condition Class 1 over 20 years, or about 1,500 acres per year.

Fire Management Units

There would be no prescribed fire would be used in the Wild and Scenic River, North Monument or South Monument FMUs.

Prescribed fire in the Wilderness Study Areas FMU would be limited to those projects that protect public safety and protect resource values or achieve resource objectives.

Alternative C

Allowing no surface disturbance in big game winter range from December 1 to March 31could adversely impact the use of prescribed fire to improve winter range. This involves about 265,559 acres of winter range.

Establishing resource reserve allotments would increase opportunities for prescribed burn projects by allowing another option for grazing during the rest cycle following the burn.

The emphasis for prescribed fire would be on reducing hazardous fuel buildup where wildland fire would threaten private and public structures and improvements. Prescribed fire activity would be based on current direction included in the BLM Fire/Fuels Management Plan Environmental Assessment/Plan Amendment (BLM 2003e) and the various watershed plans that include Monument land. Prescribed fire potential acres would be less than Alternative A because hazardous fuels would be the target of most prescribed fire activities with some range and wildlife related burns. An estimate for the Monument as a whole would involve treating 20,000 acres in 10 years or 2,000 acres per year.

Fire Management Units

There would be no prescribed fire in the Wild and Scenic River FMU.

Prescribed fire in the Wilderness Study Areas FMU would be limited to those projects that would protect public safety and resource values or achieve resource objectives. Prescribed fire treatments could involve approximately 5,200 acres over 10 years.

Prescribed fire in the North Monument FMU would be limited to those projects that protect public safety and resource values or achieve resource objectives. Prescribed fire treatments could involve approximately 6,600 acres over 10 years.

Prescribed fire in the South Monument FMU would be limited to those projects that protect public safety and resource values or achieve resource objectives. Prescribed fire treatments could involve approximately 8,200 acres over 10 years.

Alternative D

Restrictions to protect special status raptor and bald eagle nesting sites that may not be active could affect the BLM's ability to conduct prescribed fires in the vicinity. Allowing no surface disturbance in big game winter range from December 1 to May 15 could adversely affect the use of prescribed fire to improve winter range. This involves about 265,559 acres of winter range.

Establishing resource reserve allotments would increase opportunities for prescribed burn projects by allowing another option for grazing during the rest cycle following the burn.

Prescribed fire projects would include the projects proposed in the Armells, Upper Missouri, Arrow Creek and the Monument portion of the Bears Paw to Breaks watershed plans. New projects would be proposed based on FRCC analysis. Initial findings suggest that a large part of the Monument is outside its historic fire return interval. Thus, proposal of a substantial number of additional prescribed fire projects would be expected.

Fire Management Units

Prescribed fire in the Wild and Scenic River FMU would be limited to those projects that protect public safety and protect resource values or achieve resource objectives.

Prescribed fire in the Wilderness Study Areas FMU would be used to augment wildland fire in returning fire to its historic regime. Prescribed fire could involve significantly more acres than Alternatives A, B, and C (approximately 6,200 acres of proposed prescribed fire projects plus 45,000 acres of FRCC class 2 and 3).

Prescribed fire in the North Monument FMU would be used to augment wildland fire in returning fire to its historic fire regime. Prescribed fire could involve significantly more acres than Alternative A, B, and C (approximately 5,000 acres of proposed prescribed fire projects plus 100,000 acres of FRCC class 2 and 3).

Prescribed fire in the South Monument FMU would be used to augment wildland fire in returning fire to its historic fire regime. Prescribed fire could involve significantly more acres than Alternatives A, B, and C (approximately 20,000 acres of proposed prescribed fire projects plus 105,000 acres of FRCC class 2 and 3).

Alternative E

Restrictions protecting bald eagle nesting sites that may not be active could affect the BLM's ability to implement prescribed fire activities without mitigation. Allowing no surface disturbance in big game winter range could adversely affect the use of prescribed fire to improve winter range.

Not establishing resource reserve allotments could negatively impact range restoration using prescribed fire due to lack of areas to move cattle during seasonal rest periods.

Prescribed fire acres would probably be similar to Alternative D, minus the FRCC class 2 and 3 acres. Those acres would be accomplished using prescribed wildland fire. In the Wild and Scenic River FMU, prescribed fire acres would probably be less than 10,000 acres in 10 years.

Fire Management Units

Prescribed fire in the Wild and Scenic River FMU would be limited to those projects that protect public safety and protect resource values or achieve resource objectives.

Prescribed fire in the North Monument, South Monument, and Wilderness Study Areas FMU would be used to augment wildland fire in returning fire to its historic regime. Prescribed fire could involve significantly more acres than Alternatives A, B, and C.

Alternative F (Preferred Alternative)

Restrictions protecting bald eagle nesting sites that may not be active could affect the BLM's ability to implement prescribed fire activities without mitigation. Allowing no surface disturbance in big game winter range from December 1 to March 31could adversely impact the use of prescribed fire to improve winter range. This involves about 265,559 acres of winter range.

Establishing resource reserve allotments would increase opportunities for prescribed burn projects by allowing another option for grazing during the rest cycle following the burn.

Prescribed fire acres would probably be similar to Alternative D, minus the FRCC class 2 and 3 acres. Those acres would be accomplished using prescribed wildland fire. In the Wild and Scenic River FMU, prescribed fire acres would probably be less than 10,000 acres in 10 years.

Fire Management Units

Prescribed fire in the Wild and Scenic River FMU would be limited to those projects that protect public safety and protect resource values or achieve resource objectives.

Prescribed fire in the North Monument, South Monument, and Wilderness Study Areas FMU would be used to augment wildland fire in returning fire to its historic regime. Prescribed fire could involve significantly more acres than Alternatives A, B, and C.

Wildland Fire

Alternative A (Current Management)

There would be no anticipated changes from the historical average number of fires or acres under this alternative. The fire history over the last 15 years provides a comparison in these FMUs.

- In the Wild and Scenic River FMU there have been 27 fires for 1,337 acres; an average of 1.8 fires per year for 89 acres.
- In the Wilderness Study Areas FMU there have been 37 fires for 4,219 acres; an average of 2.5 fires per year for 218 acres.
- In the North Monument FMU there have been 45 fires for 5,023 acres; an average of 3 fires per year for 335 acres.
- In the South Monument FMU there have been 44 fires for 2,979 acres; an average of 3 fires per year for 199 acres.

Alternative B

Wildland fire numbers would remain similar to Alternative A, but could involve fewer acres. Under this alternative, aggressive fire suppression would be based on allowing the fewest number of acres burned without regard to cost per acre.

This alternative would reduce the estimated acreages in each FMU that could be subject to wildland fire.

- The Wild and Scenic River FMU could experience a 10% reduction. Even with increased suppression response, access would make it difficult to reduce acres burned to a significant extent.
- In the Wilderness Study Areas FMU there would be no change because of existing fire suppression guidelines based on low impact suppression methods.
- The North Monument FMU could realize a 20% reduction based on better access and no existing restraints on suppression methods.
- The South Monument FMU could realize a 20% reduction based on better access, and no existing restraints on suppression methods.

Alternative C

Fire suppression acreage figures would be similar to Alternative B.

Alternative D

The number of acres subject to wildland fire would increase, except in the Wild and Scenic River FMU. Suppression would be based on appropriate response and fires would be allowed to burn to natural barriers if the fire is not a threat to life, property or resource values. Suppression costs could be lower than other alternatives.

- In the Wild and Scenic River FMU there would be no change from Alternatives B and C.
- The Wilderness Study Areas FMU could experience an estimated 50% increase in acres from a 15 year base.
- The North Monument FMU could experience an estimated 50% increase in acres from a 15 year base.
- The South Monument FMU could experience an estimated 40% increase in acres from a 15 year base.

Alternative E

In the Wild and Scenic River FMU, the appropriate suppression response would be used for fire suppression and public safety and resource protection. Fire management in the rest of the Monument would emphasize a maximum return of fire on the landscape. A wildland fire use plan would be developed for the Wilderness Study Areas, North Monument and South Monument FMUs. The maximum acreage under this plan would be based on the historical fire regime. Fires managed under prescription could be large and at times disruptive to recreation activities in the Monument. Estimating the scope of wildland fire under this alternative is difficult, but activity would increase significantly over all other alternatives.

Alternative F (Preferred Alternative)

There would be no anticipated changes from the historical average number of fires or acres under this alternative. Fire suppression acreage figures would be similar to Alternative A.

Impacts to Fire from Visitor Use, Services and Infrastructure

Alternatives A (Current Management) and B

Large events or large groups, if permitted during the fire season, could increase the need for fire prevention efforts and workload. Not providing campfire rings or requiring camp stoves, fire pans or mats at Level 4 opportunities could increase the fire prevention workload. Preventable fire would increase suppression workload during the fire season.

Alternatives C and D

Large events or large groups, if permitted during the fire season, could increase the fire prevention workload.

Alternative E

There would be no impact.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives C and D.

Impacts to Fire from Access and Transportation

Alternatives A (Current Management) and B

Allowing unrestricted use of all airstrips in the Monument could reduce the ability of aerial fire fighting resources to operate in the air space safely. Floatplane activity could cause airspace problems during emergency activities.

Alternatives C and D

Closing airstrips during fire activity in the Monument would lessen safety concerns. Floatplane activity could cause airspace problems during emergency activities.

Alternative E

There would be no impact.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives C and D.

Summary of Cumulative Impacts to Fire

Alternatives A, B, C, D, E, and F (Preferred Alternative)

There would be no additional impacts, other than those described above, from any combination of actions.

Wilderness Study Areas

Impacts to Wilderness Study Areas Common to All Alternatives

Timber harvest, which includes thinning projects, would not be authorized under the non-impairment standard and criteria described in the BLM's Interim Management Policy

and Guidelines for Lands Under Wilderness Review (BLM Manual H-8550-1).

Livestock grazing management would continue to use existing grazing plans. Fencing along allotment boundaries would be allowed on case-by-case basis under the Interim Management Policy using BLM specifications and standards.

Aggressive wildland fire suppression efforts would continue during extreme drought years, but fire management plans must adhere to all Interim Management Policy prescriptions. The WSAs provide large areas of the VRM Class I designation and these areas would be impacted by large fires.

Special recreation permits would continue to be authorized in the WSAs for commercial, competitive, organized group activities on a case-by-case basis if they do not conflict with the non-impairment standard and criteria. Group size could be limited, depending upon the activity.

Impacts to Wilderness Study Areas from Health of the Land and Fire

Fire

Alternative A (Current Management)

This alternative would allow fire suppression within WSAs at an appropriate response level for natural caused fires. For most wildland fires, the WSA Interim Management Policy emphasizes the minimum tool (hand tools) approach to fire fighting measures. This scenario would be most unlikely unless the drought diminishes. Consequently, typical initial attack of wildland fires, including back burns and retardants, would continue to be utilized in an attempt to preserve the scenic quality of the Missouri River's timbered Breaks. Prescribed fire is a limited management tool for managing fire in WSAs, and Interim Management Policy encourages the natural role of fire.

Alternative B

Fire suppression tactics would use all available resources during high drought periods if private properties are threatened and/or for public safety reasons. Fire response measures in WSAs that are more aggressive than minimum tool would be at the BLM's discretion; however, the emphasis would be to limit impacts to the landscape. Prescribed fire is a limited management tool for managing fire in WSAs, and management discretion to use this fire management technique is limited.

Alternative C

The impacts would be similar to Alternative A, but with an emphasis toward wildland fire's natural role in the WSAs. Prescribed fire would give managers the latitude needed to exercise a range of options when these occurrences have the potential to impact private property and/or public safety.

Alternative D

Under this alternative, naturally occurring conditions or lightning starts would allow a large degree of management flexibility. An appropriate response level (minimum tool if possible) would enable the BLM to better manage the WSAs consistent with the non-impairment standard and criteria.

Alternative E

This is the least restrictive and most natural alternative for managing fire in the WSAs and would utilize the natural role of fire when and where possible. However, management strategies would use well defined weather patterns and moisture regimes in the rugged Breaks topography, along with social sensitivity levels about fire's natural role before making any decision to employ heavy fire fighting suppression tactics.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternative D.

Range Improvements

Alternative A (Current Management)

Fencing improvements would continue to follow BLM standards to enable wildlife movement. Existing water developments would be a critical component within the WSAs due to a lack of natural water sources other than the river in the summer and fall months. All water developments would be maintained under the Interim Management Policy.

Alternatives B, C, D, E and F (Preferred Alternative)

New water developments would not be permitted within the WSAs. Maintenance of existing water developments would be permissible under the Interim Management Policy. Such developments (including fences), if not maintained, would be removed and reclaimed. Crossing structures could help facilitate the movement of livestock and perhaps wildlife through the WSAs. Relocating fences to better follow topography would complement and improve the character of the area.

Visual Resource Management (VRM)

Alternative A (Current Management)

Under current management, about 16% of the WSAs are in VRM Class I, 19% in VRM Class II, and 65% in VRM Class IV. However, under the non-impairment standard, most activities must be temporary uses that create no surface disturbance, nor involve permanent placement of structures.

Alternatives B, C, D, E and F (Preferred Alternative)

These alternatives designate a VRM Class I rating for all the WSAs (74,650 acres). These alternatives would preserve the scenic quality of the WSAs.

Rights-of-Way

Alternative A (Current Management)

Under current management about 42% of the WSAs are in avoidance areas and 58% in exclusion areas. of the six WSAs excludes ROW approvals. However, under the non-impairment standard, most activities must be temporary uses that create no surface disturbance, nor involve permanent placement of structures.

The WSAs not designated by Congress would be subsequently managed in accordance with adjacent BLM land. Those areas within the Cow Creek ACEC and recreation and scenic sections of the UMNWSR would be avoidance areas and those areas within the wild sections of the UMNWSR would be exclusion areas.

Alternative B

All the WSAs would be exclusion areas (74,650 acres).

The WSAs not designated by Congress would be subsequently managed in accordance with adjacent BLM land. Those areas within the Cow Creek ACEC and scenic sections of the UMNWSR would be avoidance areas and those areas within the wild sections of the UMNWSR would be exclusion areas.

Alternative C

All the WSAs would be exclusion areas (74,650 acres).

The WSAs not designated by Congress would be subsequently managed as avoidance areas except those areas within the wild sections of the UMNWSR.

Alternatives D and E

All the WSAs would be exclusion areas (74,650 acres).

The WSAs not designated by Congress would be subsequently managed as exclusion areas.

Alternative F (Preferred Alternative)

The impacts would be the similar as Alternative C, but exceptions to the exclusion area category could be granted and would be handled on a case-by-case basis, depending on the nature of the proposal and the level of impact.

Impacts to Wilderness Study Areas from Visitor Use, Services and Infrastructure

Alternative A (Current Management)

Current management of special recreation permits (SRPs) in the WSAs allows authorization of commercial big game outfitting, organized group activities and certain competitive events without considering carrying capacities.

There are 12 authorized big game commercial outfitters operating within a portion of the six WSAs, and these operators have defined area(s), usually within a ranch boundary, where they conduct their business. An unlimited number of SRPs could be issued under this alternative, subject to the non-impairment standard and criteria.

Commercial auto tours and special event SRPs would be authorized on a case-by-case basis and an unlimited number of these permits could be issued. Currently, SRP group size within a WSA is not limited, but restrictions on the number of people or recreational livestock may occur within the WSAs.

Alternative B

The impacts would be similar to Alternative A, except big game commercial outfitters would be assigned to the entire Monument. There would be 14 commercial outfitters potentially operating within the six WSAs.

Alternative C

The impacts would be similar to Alternative A, except big game commercial outfitters would be assigned to the entire Monument and the number of outfitters would be limited to 14 who could potentially operate within the six WSAs.

Alternative D

The impacts would be similar to Alternative A, except only a portion of five of the WSAs (32,500 acres) are within

areas identified with limited public access, which would be assigned to big game commercial outfitters. An unlimited number of SRPs could be issued under this alternative, subject to the non-impairment standard and criteria.

Alternative E

The impacts would be similar to Alternative A, except only a portion of the six WSAs (42,150 acres) are within areas identified with public access, which would be assigned to big game commercial outfitters. An unlimited number of SRPs could be issued under this alternative, subject to the non-impairment standard and criteria.

Alternative F (Preferred Alternative)

This alternative is the same as Alternative A, except that big game commercial outfitter SRPs would be limited to present levels of use in the WSAs. Commercial auto tour operator permits, while not being limited at a specific number, would be limited to two vehicles per operator a day.

Impacts to Wilderness Study Areas from Natural Gas Exploration and Development

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

One leased parcel of 1,441 acres exists within the Ervin Ridge WSA. Solitude and other opportunities for a wilderness experience would be lost if this lease is developed. Under Alternatives A, B, and C it is reasonably foreseeable one new natural gas well could be drilled on this lease within the WSA. Under Alternatives D, E, and F it is reasonably foreseeable no new natural gas wells would be drilled on this lease.

Impacts to Wilderness Study Areas from Access and Transportation

BLM Road System

Alternatives A (Current Management) and B

The use of designated vehicle ways in WSAs would continue. There are 65 vehicle ways in the WSAs totaling 56 miles (Table 4. 34). However, 6 miles of vehicle ways have reclaimed naturally. The potential for soil erosion and vegetation decline would increase under this alternative.

The use of non-motorized/mechanized game carts would be prohibited. While using game carts would give the hunters opportunity to hunt further from vehicles, allowing this activity could create new trails along ridges and within riparian areas and introduce exotic plant species into the WSAs.

Alternative C

The impacts would be similar to Alternative B, but allowing vehicle ways to reclaim naturally would be consistent with VRM Class I designations. Six miles of vehicle ways would be closed (Table 4.35). Not seeing numerous roads from the air or ground would improve the scenic quality value of the WSAs and ultimately enhance visitor satisfaction and experience when seeking pristine or primitive

Table 4.34
Vehicle Ways in Wilderness Study Areas – Alternative A (Current Management)

Miles	*Stafford*	*Ervin Ridge*	*Cow Creek*	*Antelope Creek*	*Woodhawk*	*Dog Creek*	*Total Miles*
Open	3	10	24	11	2	6	56
Closed	0	0	0	0	0	0	0
Total	3	10	24	11	2	6	56

Table 4.35
Vehicle Ways in Wilderness Study Areas - Alternative C

Miles	*Stafford*	*Ervin Ridge*	*Cow Creek*	*Antelope Creek*	*Woodhawk*	*Dog Creek*	*Total Miles*
Open	2	9	21	11	2	5	50
Closed	1	1	3	0	0	1	6
Total	3	10	24	11	2	6	56

environments. Game carts would be allowed on closed vehicle ways.

Alternative D

The impacts would be similar to Alternative C, but administratively closing all vehicle ways is consistent with the intent and purpose of the Interim Management Policy. Access to remote or popular areas within the WSAs that have heretofore been accessible by vehicle would end and ultimately impact some visitor experiences. However, not being able to drive to these locations could improve opportunities for wilderness visitors seeking solitude and pristine conditions without motorized assistance. Game carts would be allowed on closed vehicle ways.

Alternative E

The impacts would be similar to Alternative D, except game carts would not be allowed on closed vehicle ways.

Alternative F (Preferred Alternative)

The impacts would be similar to Alternative B, but allowing vehicle ways to reclaim naturally would be consistent with VRM Class I designations. Fourteen miles of vehicle ways would be closed and two miles would be closed seasonally. Not seeing numerous roads from the air or ground would improve the scenic quality value of the WSAs and ultimately enhance visitor satisfaction and experience when seeking pristine or primitive environments. Game carts would be allowed on closed vehicle ways.

Aviation

Alternative A (Current Management)

Current management allows continued use of the backcountry airstrip in the Ervin Ridge WSA. Airplane viewing of the Missouri Breaks is an ongoing and popular activity. Continued use of the Ervin Ridge airstrip could provide pilots with the ability to load or unload commercial passengers under an SRP. However, use levels of this airstrip are unknown at the present time. Hunters may also occasionally use the Ervin Ridge airstrip. Because of public safety concerns, military overflights may limit some recreational use of the airspace in and around the Monument to a certain extent. Military overflight noise levels also are a source of concern for wilderness visitors; much more than a small fixed-wing aircraft.

Alternative B

The impacts would be similar to Alternative A, except the vehicle way to the Ervin Ridge airstrip would be closed seasonally from April 1 to June 15.

Alternatives C and D

The impacts would be similar to Alternative A, except the vehicle way to the Ervin Ridge airstrip would be closed yearlong and the airstrip would be closed seasonally from December 1 to June 15.

Alternative E

No airstrips would be open under this alternative. This would enhance WSA values.

Alternative F (Preferred Alternative)

The impacts would be the same as Alternatives C and D.

Summary of Cumulative Impacts to Wilderness Study Areas

Alternatives A (Current Management) and B

The WSAs are being maintained along with the UMNWSR, which includes a portion of each WSA. Today, the WSAs are in good condition, with some exceptions where vehicle and/or boating traffic have affected the resource.

The cumulative impacts of visitor crowding and repeated use of campsites along the river and/or on vehicle ways in the WSAs would create the potential to affect the wilderness resource at all six WSAs.

Geocaching using Global Positioning System devices could occur deep within the WSAs if all vehicle ways remain open.

Alternative C

The impacts would be similar to those in Alternative A, except restricting spring and fall use of WSA vehicle ways would protect the sensitive vegetation and soil resources.

Alternative D

The impacts would be similar to those in Alternative A, except closing all the WSA vehicle ways would protect the sensitive vegetation and soil resources.

Alternative E

Not allowing the use of game carts on closed vehicle ways in the WSAs is consistent with the non-impairment standard and criteria and would protect the landscape from other potential future mechanical or mechanized trends in recreation.

Alternative F (Preferred Alternative)

This alternative could produce more effective and efficient management of the WSAs through controlled recreational access, a backcountry airstrip seasonal restriction and visual resource management objectives for Class I areas. The area could see an increase in visitors seeking the solitude common in the six WSAs.

Social

Impacts to Social Common to All Alternatives

No alternative would affect the demographics, major social trends, or social organization in the local communities of the planning area.

Under all alternatives, individuals with disabilities could request a permit to travel on closed roads consistent with the Rehabilitation Act of 1973. Such access would be considered on a case-by-case basis by the Monument manager.

Environmental Justice

During the course of this analysis, no alternative considered resulted in any identifiable effects or issues specific to any minority or low income population or community. The agency has considered all input from persons or groups regardless of age, race, income status, or other social or economic characteristics.

Impacts to Social from Health of the Land and Fire

Alternative A (Current Management)

Under this alternative, management for wildlife, fire, vegetation, livestock grazing and other activities would continue as it has under the State Director's Interim Guidance. This would agree with people, particularly those living in the local area, who would prefer little change in management.

During scoping, the BLM received many comments that groups and individuals who give a high priority to resource protection would feel wildlife habitat would not be adequately protected under this alternative.

Most local residents would want wildland fires to be fought as aggressively as possible. This alternative plans for about 3,500 acres of prescribed fire annually based on public safety and resource values, which may be a concern to local residents.

Alternative B

Under this alternative, fire, vegetation, livestock grazing and other activities would be managed more intensively than under any other alternative. This would agree with the management goals of those groups and individuals who give a high priority to resource use.

Wildlife habitat would be enhanced. The groups and individuals who give a high priority to resource protection may feel wildlife habitat would be adequately protected under this alternative.

Wildland fire would be fought most aggressively under this alternative. Most local residents want wildland fires to be fought aggressively using all available methods. The limited use of prescribed fire considered under this alternative would probably be acceptable to local residents.

Resource reserve allotments would be established under this alternative. If made available, these allotments could allow added livestock grazing management flexibility.

Alternative C

Wildlife habitat would be enhanced and the social effects would be similar to Alternative B.

The social effects of wildland fire suppression would be similar to Alternative B, except in WSAs wildland fires would not be fought as aggressively. The social effects of prescribed fire would be similar to Alternative A.

The effects to ranchers from livestock grazing management would be the same as Alternative B.

Alternative D

Wildlife habitat for would be enhanced. The groups and individuals who give a high priority to resource protection would feel wildlife habitat would be adequately protected under this alternative.

Compared to Alternative A, more land could be burned during wildland fires because fires would be allowed to burn to natural barriers (if the fire is not a threat to life, property or resource values). Most local residents want wildland fires to be fought aggressively using all available methods, rather than allowing more land to burn.

The social effects to ranchers from livestock grazing management would be the same as Alternative B.

Alternative E

Wildlife habitat would be enhanced. The groups and individuals who give a high priority to resource protection

would feel wildlife habitat would be adequately protected under this alternative. However, individuals and groups who would give a high priority to resource use may feel too much protection is given to wildlife habitat.

Wildland fire would be fought least aggressively under this alternative. Fire could become large and at times disruptive to recreation activities in the Monument. The potential social effects from wildland fires could include smoke (causing eye, throat or lung irritation), loss of property and reduced recreation potential (BLM 2003e). Most local residents want wildland fires to be fought aggressively using all available methods.

Some ranch operations may find it difficult to adjust to some of the management proposed under this alternative. This includes restricting some water facilities which could limit the use of forage, strict limits on fencing specifications which would lead to higher livestock management costs, limits to accommodate wildlife during specific grazing seasons on some allotments, and limitations on travel which could make management of livestock and range improvements more difficult. In addition, resource reserve allotments would not be available to give the livestock operations more flexibility.

Alternative F (Preferred Alternative)

Wildlife habitat would be enhanced under this alternative. The groups and individuals who would give a high priority to resource protection would feel wildlife habitat would be adequately protected under this alternative.

The social effects of wildland fire suppression and prescribed fire would be the same as Alternative D.

The social effects to ranchers from livestock grazing management would be the same as Alternative B.

Impacts to Social from Visitor Use, Services and Infrastructure

Alternative A (Current Management)

This alternative is responsive to the desires of groups and individuals who feel Monument management should continue as it has in the past, and would enhance their social wellbeing. Recreationists who desire a primitive experience and those who give a high priority to resource preservation would not feel current and potential problems would be addressed under this alternative. This could cause a decline in their social wellbeing.

Future research and collection activities would remain most similar to current management. Activities allowed would include archeological and paleontological investigation and research, collection of invertebrate fossils and petrified wood in specific areas, use of a metal detector with a permit, wildcrafting, and horn hunting. There would be no Christmas tree, post and poles, firewood or log cutting for personal use, and SRPs would be required for all special activities. A large number of unrestricted activities would be allowed under this alternative. However, the removal or collecting of specimens (horn, petrified wood, archeological artifacts) and continuation of other unrestricted activities may reduce the opportunities for other land users as the demands for these and other activities increase in the future and options for dealing with the increase in demand are not available. Declines in the quality of recreation and the social wellbeing of recreationists could occur if new issues could not be addressed.

River recreation would be a continuation of current management. Many choices would remain available for river users including: being allowed to camp at sites for up to 14 days, not having to use camp stoves, fire pans or fire mats, no restrictions on group size up to 50, fees at the James Kipp Recreation Area, and a seasonal downstream travel restriction at no-wake speed on the wild and scenic segments of the river. Current issues such as the effects of large groups on the experience of other users, the effects of potential increases in visitors in the future, and crowding at the most popular campsites would not be addressed. In addition, signing could detract from the visual quality and primitive setting of the UMNWSR. This alternative would not address many of the concerns identified during scoping such as keeping the river experience primitive and concerns about noise. Some recreationists feel very strongly that there should be time on the Missouri River when motorized watercraft are prohibited. This desire would not be met under this alternative.

Upland recreation would be a continuation of current management. Many choices would remain available for upland recreation users including: having access to 98% of the BLM roads at some time during the year, no restrictions with on-road game retrieval because most roads would be open, and (except in WSAs) off-road access for hunters to retrieve tagged animals with non-motorized, non-mechanized game carts. Acquiring more access could enhance recreational opportunities. Dispersed camping with no requirement for camp stoves, fire pans or fire mats would be allowed but camping opportunities would be limited to those sites accessible by foot from a designated road. No fees would be charged for camping. Recreation development in the uplands could occur if a partnership were developed through local service organizations. A full range of signs and kiosks could be developed and the primitive nature of the uplands may be visually compromised in some places. This alternative would not be versatile enough to address increases in demand that may occur with future increases in use, and recreation quality could decline in the future if problems could not be addressed.

Opportunities to retrieve game by motorized vehicle would be the most liberal under this alternative and may provide needed opportunities for an older population.

Livestock permittees would continue to access their allotments as they have in the past.

In the uplands, SRPs for commercial motorized tours and commercial hunting would be unlimited. Growth in commercial motorized tours could lead to increased traffic levels and concern from recreationists desiring a more primitive experience. The SRPs for outfitted hunting would be assigned to specific areas which could decrease potential conflicts between commercial and general public hunters.

Under this alternative, the BLM would encourage, but not participate in the development of staffed sites in gateway communities to provide visitor information and would not receive the benefit these partnerships could create.

Alternative B

This alternative is responsive to and would enhance the social wellbeing of rural communities and those who give a high priority to resource use. Recreationists seeking a primitive experience and those who give a high priority to resource preservation would not feel current and potential problems would be addressed under this alternative. This could cause a decline in their social wellbeing.

Future management for research and collection activities would be slightly less restrictive than under Alternative A. Activities allowed would include archeological and paleontological investigation and research, collection of invertebrate fossils and petrified wood, use of a metal detector in some areas without a permit, wildcrafting, horn hunting, and Christmas tree, post and pole, firewood and log cutting for personal use. SRPs would be required for all special activities. This alternative would allow, however, the largest number of unrestricted activities. The removal or collecting of specimens (horn, petrified wood, archeological artifacts) and other unrestricted activities may reduce opportunities for other land users as the demands for these activities and other activities increase in the future and options for dealing with the increase in demand are not available. Declines in the quality of recreation and the social wellbeing of recreationists could occur if new issues could not be addressed.

River recreation would be less restricted than under Alternative A and recreationists using motorboats and personal watercraft, and landing floatplanes would have unrestricted use of the Missouri River during all seasons. Many choices would remain available for river users including: being allowed to camp at sites for up to 14 days; unrestricted camping on islands on the Missouri; not having to use camp stoves, fire pans or fire mats; lack of restrictions on any group size; and no camp fees. SRPs for river trips would be unlimited. Current issues such as the effects of large groups on the experience of other users, the effects of potential increases in visitors in the future, and crowding at the most popular campsites could be addressed by providing more sites and launch/take-out facilities, but this could affect the primitive nature of the visitor experience. In addition, signing could be erected anywhere along the river for any purpose and could detract from the visual quality and primitive setting of the UMNWSR. This alternative would not address many of the concerns identified during scoping such as keeping the river experience primitive and concerns about noise. Some recreationists feel very strongly that there should be time on the Missouri River when motorized watercraft are prohibited. This desire would not be met under this alternative.

Under this alternative, upland recreationists would have reduced opportunities for on-road game retrieval as compared to Alternative A; hunters (except in WSAs) would have off-road access to tagged animals with non-motorized, non-mechanized game carts; and hunters would have access to some identified closed roads during early morning and late evening hours for game retrieval. Additional opportunities for mountain bikers may occur on closed roads. Acquiring more access could enhance recreational opportunities. Dispersed camping with no requirement for camp stoves, fire pans or fire mats would be allowed and campers may access campsites up to 300 feet from roads. No fees would be charged for camping. Level 1, 2 and 3 sites could be constructed in the uplands. A full range of signs and kiosks could be developed and the primitive nature of the uplands may be visually compromised in some places. In the uplands, SRPs for commercial motorized tours and the number of vehicles would be unlimited; however, vehicles associated with the permit would be restricted to mostly local and collector roads. There would be no limit to the number of SRPs for commercial hunting with permits assigned to the entire Monument.

Overall, in the uplands, the effect of this alternative would increase opportunities for bighorn sheep wildlife watching, semi-primitive motorized activities, mountain biking, and walk in-hunting opportunities. However, conflicts may increase between commercial hunters and general public hunters and the ability to retrieve game during the morning and evening hours may disrupt other hunters.

Opportunities to retrieve game by motorized vehicle would be less than under Alternative A, but would still provide a variety of opportunities for an older population.

Livestock permittees would continue to access their allotments as they have in the past.

The BLM could develop staffed sites or strive to partner with gateway communities in Big Sandy, Chinook and Winifred to provide visitor information. This could enhance relationships between the recreationists and residents, and provide tourist-related economic opportunities for local residents.

Alternative C

This alternative is less responsive than Alternatives A or B to the desires of individuals and groups who want Monument management to continue as it has in the past and emphasize resource use. It is more responsive than Alternatives A or B to others who desire a primitive experience and those who feel Monument management should emphasize resource protection. However, some people may feel this alternative does not go far enough to lay the groundwork to be able to address problems that arise in the future.

Future research and collection activities would be slightly more restricted than with Alternative A. Activities allowed would include archeological and paleontological investigation and research, collection of invertebrate fossils and petrified wood in specific areas, use of a metal detector in some areas without a permit, wildcrafting in specific areas, horn hunting at specific times, and Christmas tree, post and pole, firewood and log cutting for personal use. SRPs would be required for all special activities. Most activities would be allowed, but may be restricted to specific areas or seasons, which would lay the groundwork to address issues that emerge in the future.

River recreation would generally be more restrictive than under Alternative A. The restrictions would include a 2-night limit at Level 2 sites during the core use period; at Level 4 opportunities camp stoves, fire pans or fire mats would be required; restrictions on groups of 20 or more to the historically slower days during the core use period; camp fees would be charged at all Level 1 sites, use of personal watercraft and landing floatplanes would be allowed on river miles 0 to 3; and downstream travel at no-wake speed would be allowed on the wild and scenic segments of the river during the core use period. In addition, standards and indicators would be used to manage visitor use and impacts to resources. If standards and indicators are exceeded, remedies would be taken without limiting the number of people boating the river. Additional campgrounds could be developed to accommodate increases in use. Signs would be carefully managed to ensure the visual quality and primitive setting of the UMNWSR would not be diminished. Current issues such as the effects of large groups on the experience of other users, the effects of potential increases in visitors, and crowding at the most popular campsites would be addressed, to some extent, under this alternative. This alternative would address some of the concerns identified during scoping such as keeping the river experience primitive and concerns about noise, although some would be disappointed that there would be no time when motorized boats are prohibited on the river.

Upland recreationists would have reduced opportunities for on-road game retrieval as compared to Alternatives A and B, hunters would have off-road access to tagged animals with non-motorized, non-mechanized game carts (except in the WSAs), and access to some identified closed roads during mid-day for game retrieval. Additional opportunities for mountain bikers may occur on closed roads. Acquiring more access could enhance recreational opportunities. At Level 4 opportunities camp stoves, fire pans or fire mats would be required. Campers may access campsites up to 150 feet from roads. Level 1 sites could be constructed only at the beginning of public access roads into the Monument. Level 2 sites would be park and explore sites where people could walk from designated parking areas and Level 3 sites would be pull-out sites adjacent to the road. SRPs for commercial motorized tours and the number of vehicles would be unlimited but vehicles associated with the permit would be restricted to local and collector roads. The number of SRPs for commercial hunting would be limited to the current number, but each permit would be assigned to the entire Monument. The primitive nature of the uplands may be compromised by signing.

Overall, in the uplands, this alternative would increase opportunities for bighorn sheep wildlife watching, semi-primitive motorized activities, mountain biking and walk-in hunting opportunities. Although the number of SRPs for commercial hunting would be limited to current numbers, the unlimited numbers of guides could lead to increased conflicts in areas favored by the general public.

Opportunities to retrieve big game would be less than provided by Alternatives A and B, but would still provide a variety of opportunities for an older population.

Livestock permittees would be allowed to travel upstream to administer a grazing permit with prior notification to the BLM or verbal authorization from the BLM in unplanned situations. Driving on closed roads and off road to administer their permit would continue for permittees as it has in the past.

The BLM would strive to develop staffed sites or partner with the gateway communities of Big Sandy, Chinook and Winifred to provide visitor information. This could enhance relationships between the recreationists and residents, and provide tourist-related economic opportunities for local residents.

Alternative D

Recreationists who desire a primitive experience and those who give a high priority to resource preservation would feel current and potential problems are addressed under this

alternative. Individuals and groups who want Monument management to continue as it has in the past and emphasize resource use would feel it is less responsive than Alternatives A, B or C, even though the social and economic analyses predict little effect to local landowners and communities.

Future research and collection activities would be similar to Alternative C, except forest product collection would be limited to Christmas trees and firewood. Most activities would be allowed, but may be restricted to specific areas or seasons. SRPs would be required for special events and these events would be allowed on a case-by-case basis.

River recreation would generally be more restrictive than under Alternative C. The restrictions would include a 2-night limit at Level 2 sites during the core use period, camping disallowed seasonally on islands, Level 4 opportunities camp stoves, fire pans or fire mats would be required, groups larger than 30 would require an SRP to boat the river, fees would be charged at existing Level 1 sites, and no new Level 1 sites would be developed. Use of personal watercraft and landing of floatplanes would be allowed on river miles 0 to 3, and downstream travel at no-wake speed would be allowed on the wild and scenic segments of the river during the core use period. In addition, standards and indicators would be used to manage visitor use and impacts to resources. If standards or indicators are exceeded, remedies would be taken which could limit the number of people boating the river. Signs would be carefully managed to ensure the visual quality and primitive setting of the UMNWSR would not be diminished. Current issues such as the effects of large groups on the experience of other users, the effects of potential increases in visitors, and crowding at the most popular campsites would be addressed under this alternative. This alternative would also address the concerns identified during scoping such as keeping the river experience primitive and concerns about noise.

Upland recreationists would have reduced opportunities for on-road game retrieval as compared to Alternative C; off-road access to tagged animals with non-motorized, non-mechanized game carts (except in WSAs); and hunters would have access to some identified closed roads during mid-day for game retrieval. There would be no attempt to acquire more access. At Level 4 opportunities camp stoves, fire pans or fire mats would be required. Campers may access campsites up to 10 feet from a road. Level 1 sites would not be allowed. Level 2 sites would only be developed on main artery roads. Level 3 sites would be pull-out sites adjacent to the road. Signs would be commensurate with visual surroundings and the level of development. SRPs for commercial motorized tours would be restricted to two vehicles per operator per day and SRPs for commercial hunting would be issued in areas with limited public access.

Overall in the uplands, the effect of this alternative would be to increase opportunities for a primitive experience including bighorn sheep wildlife watching, semi-primitive motorized activities, and walk-in hunting opportunities.

Opportunities to retrieve big game would be less than provided by Alternatives A, B, and C, but would still provide a variety of opportunities for an older population. The BLM could designate specific closed roads for use by individuals with disabilities, based on demand or on a case-by-case basis.

Livestock permittees would be allowed to travel upstream to administer a grazing permit with prior notification to the BLM or verbal authorization from the BLM in unplanned situations. Driving on closed roads and off road to administer their permit would be allowed seasonally.

The BLM would strive to develop staffed sites or partner with the gateway communities of Big Sandy, Chinook and Winifred to provide visitor information. This could enhance relationships between the recreationists and residents, and provide tourist-related economic opportunities for local residents.

Alternative E

Activities on the Monument would be more restricted than under any other alternative. Recreationists who desire a primitive experience and those who give a high priority to resource preservation would feel current and potential problems are addressed under this alternative. However, they may agree this alternative restricts activities too severely. This is the least responsive alternative to individuals and groups who feel Monument management should continue as it has in the past and should emphasize resource use.

No research, collection or large group activities would be allowed. Many of the activities that visitors current enjoy, such as horn hunting, metal detecting, collecting invertebrate fossils, firewood collecting, etc. would not be allowed. Most visitors would feel activities would be too restricted under this alternative.

River recreation would be more restrictive than under any other alternative. No motorized watercraft would be allowed on the Missouri River. Other restrictions would include a 2-night limit at Level 2 and 3 sites during the core use period, at Level 4 opportunities camp stoves, fire pans or fire mats would be required, groups of more than 16 would have to obtain a SRP, fees would be charged at all Level 1 sites and for boating the river, camping on islands would be prohibited, the number of user days for guided trips would be limited, and no additional campgrounds would be constructed. The development and implementation of an allocation system, which could limit the numbers

of visitors, would be initiated upon completion of the RMP. Signs would be limited to Level 1 sites and would fit in with the visual surroundings and level of development. Current issues such as the effects of large groups on the experience of other users, the effects of potential increases in visitors in the future, and crowding at the most popular campsites would be addressed under this alternative. This alternative would also address concerns about noise and keeping the experience primitive, but some visitors would consider the remedies under this alternative to be too extreme.

Upland recreationists would have access to only 16% of current BLM road miles. This would result in reduced opportunities for on-road game retrieval as compared to Alternative C, reduced opportunities to access state and private lands for hunters and other visitors compared Alternative A, and use of non-motorized/non-mechanized game carts for hunters to access tagged animals would be restricted to closed roads. There would be no attempt to acquire more access. Commercial guided tours would not be allowed but SRPs for outfitted hunting would be unlimited. At Level 4 opportunities camp stoves, fire pans and fire mats would be required. Campers could not pull off designated routes for camping. Level 1, 2 and 3 sites would not be allowed. Signs would be commensurate with visual surroundings and the level of development. This alternative would maintain the primitive nature of the Monument interior and would create primarily primitive non-motorized opportunities. Some visitors would consider the restrictions in this alternative to be too extreme.

Big game retrieval would be more restricted than in all other alternatives with no access to closed roads and no off road game cart use which would minimize the opportunities available for the older population. The BLM could designate specific closed roads for use by individuals with disabilities, based on demand or on a case-by-case basis.

Livestock permittees would be able to drive on closed roads and off road to administer their permit on a case-by-case basis. They would be allowed to travel upstream to administer a grazing permit with prior notification to the BLM or verbal authorization from the BLM in unplanned situations.

The BLM would not develop staffed sites for visitor information or strive to partner with the gateway communities of Big Sandy, Chinook and Winifred, but would provide visitor information to the local communities. This could preclude enhancing the relationships between local communities and recreationists.

Alternative F (Preferred Alternative)

Recreationists who desire a primitive experience and those who give a high priority to resource preservation would feel current and potential problems are addressed under this alternative. Individuals and groups who feel Monument management should continue as it has in the past, and should emphasize resource use, would feel it is less responsive than Alternatives A, B, or C even though the social and economic analyses predict little effect to local landowners and communities under this alternative.

The following research and collection activities would be allowed: archeological and paleontological investigation and research; collection of invertebrate fossils and petrified wood in specific areas; use of a metal detector by permit only; wildcrafting; horn hunting with imposition of a seasonal restriction if wildlife harassment becomes a problem; and Christmas tree and firewood collection for personal use. SRPs would be required for large events and these events could be disallowed on a case-by-case basis. Most activities would be allowed, but some may be restricted to specific areas or seasons. This alternative would provide options to use if problems develop in the future.

River recreation under this alternative would be similar to Alternative D. The restrictions would include a 2-night limit at Level 2 sites during the core use period; at Level 4 opportunities camp stoves, fire pans or fire mats would be required; groups of more than 30 would have to obtain a SRP; groups of more than 20 could launch at Coal Banks Landing and Judith Landing only on Wednesday, Thursday or Friday during the core use period; fees would be charged at all Level 1 sites and for boating the river ; camping on islands on the Missouri River would be prohibited seasonally; and additional Level 1 sites would be constructed only in the recreation segment of the UMNWSR. Use of personal watercraft and landing of floatplanes would only be allowed on river miles 0 to 3; downstream motorized travel at no-wake speed would be allowed on river miles 52 to 84.5 during the core use period; and motorized watercraft would be prohibited on river miles 92.5 to 149 during the core use period. In addition, standards and indicators would be used to manage visitor use and impacts to resources. If standards or indicators were exceeded, remedies would be taken without limiting the number of people boating the river. Signs would be carefully managed to ensure the visual quality and primitive setting of the UMNWSR is not diminished. Current issues such as the effects of large groups on the experience of other users, the effects of potential increases in visitors, and crowding at the most popular campsites would be addressed under this alternative. This alternative would also address concerns about noise and keeping the experience primitive that were identified during scoping by prohibiting motorized watercraft on river miles 92.5 to 149 during the core season.

Upland recreationists would have reduced opportunities for on-road game retrieval as compared to Alternative C; off-road access to tagged animals with non-motorized, non-mechanized game carts (except in WSAs); and hunters would have access to some identified closed roads during mid-day for game retrieval. Acquiring additional access

could enhance recreational opportunities. At Level 4 opportunities camp stoves, fire pans or fire mats would be required. Campers may access campsites up to 300 feet from a road. Level 1 sites would only be constructed at the beginning of public access roads into the Monument. Level 2 sites would be park and explore sites. Level 3 sites would be pull-out sites adjacent to the road. Signs would be commensurate with visual surroundings and the level of development. SRPs for commercial motorized tours would be restricted to two vehicles per operator and SRPs for commercial hunting would be limited to the current number.

Overall, in the uplands, this alternative would increase opportunities for a primitive experience including bighorn sheep wildlife watching, semi-primitive motorized activities, and walk-in hunting opportunities.

Opportunities to retrieve big game would be less than under Alternatives A, B, and C, but would still provide a variety of opportunities for an older population. If the need arises, the BLM could identify specific designated closed roads as access for individuals with disabilities.

Livestock permittees would be allowed to travel upstream to administer a grazing permit with prior notification to the BLM or verbal authorization from the BLM in unplanned situations. Driving on closed roads and off-road to administer their permit could continue as it has in the past for permittees.

The BLM would strive to develop staffed sites or partner with the gateway communities of Big Sandy, Chinook and Winifred to provide visitor information. This could enhance relationships between the recreationists and residents, and provide tourist-related economic opportunities for local residents.

Impacts to Social from Natural Gas Exploration and Development

Alternative A (Current Management)

The natural gas resource would be managed most similarly to the State Director's Interim Guidance. Many people, particularly those living in the local area, would prefer the management to remain unchanged. However others, would be concerned that not enough protection was being given to wildlife and visual resources.

Alternative B

Under this alternative, slightly more gas could be produced than under Alternative A. Social effects would be similar to Alternative A.

Alternative C

Under this alternative, slightly less gas could be produced than under Alternative A. Social effects would be similar to Alternative A.

Alternative D

Nearly 50% less gas could be produced than under Alternative B. Although no significant study area economic effects are predicted, people who give priority to resource use would feel natural gas management would be too restrictive. Those who give a high priority to resource protection would prefer this alternative to A, B, and C, but still may have wildlife concerns.

Alternative E

Nearly 66% less gas could be produced than under Alternative B. Although no significant study area economic effects are predicted, people who give priority to resource use would feel natural gas management would be too restrictive. Those who give a high priority to resource protection may prefer this alternative to A, B, C and D.

Alternative F (Preferred Alternative)

Under this alternative, production would be similar to Alternative A. More protection would be in place for wildlife and visual resources, but not as much as for Alternative E.

Impacts to Social from Access and Transportation

Alternative A (Current Management)

Access and transportation management would remain the same. The public would retain their options to travel on all existing BLM roads within the Monument. Some people have indicated this is important to them. However, others feel current resource problems are not being addressed in this alternative.

Alternative B

Slightly more roads would be closed than under Alternative A. These roads would be closed to address resource concerns. Some people would feel these road closures would be important to protect wildlife. Others who use these roads for activities other than lease maintenance, would lose the option to use some roads they previously had available to them. However, other than Alternative A, this alternative closes the fewest roads and miles.

Some closed roads could be designated for mechanized use such as mountain bikes; the BLM would attempt to acquire access where no legal public access exists; motorized or mechanized vehicles would be allowed to pull off 300 feet to camp; and game retrieval would be allowed on some identified closed roads. The latter two provisions would provide more opportunities for the aging public. However, there is concern that it would be difficult to enforce these activities and that some people would use them as an excuse to drive on closed roads.

All 10 existing airstrips would remain open and additional airstrips could be allowed after environmental review. People who use these airstrips would feel their options maintained and/or enhanced.

Alternative C

Under this alternative, slightly more roads would be closed than under Alternative B. These roads would be closed to address resource concerns. Effects would be similar to Alternative B.

Some closed roads could be designated for mechanized use such as mountain bikes; the BLM would attempt to acquire access where no legal public access exists; motorized or mechanized vehicles would be allowed to pull off 150 feet (outside wilderness study areas) to camp; and game retrieval would be allowed from 10 a.m. to 2 p.m. on some designated roads and for three hours after the legal hunting time. The latter two provisions would provide more opportunities for the aging public. However, there is concern that it would be difficult to enforce these activities and that some people would use them as an excuse to drive on closed roads.

Seven of the 10 existing airstrips would remain open, but they could be seasonally restricted. People who use these airstrips may feel the loss of some options they previously enjoyed

Alternative D

About half of the BLM road mileage would be available yearlong. Roads would be closed to address resource concerns. Some roads commonly used for dispersed recreation would remain open. Some people would feel these road closures would be important to protect wildlife. Others who use these roads for activities other than lease maintenance, would lose the option to use some roads they previously had available to them. Some people have indicated that the ability to use these roads is very important to them.

No additional access to BLM lands would be acquired. Some closed roads could be limited to specific motorized and/or mechanized use, off-road camping would be allowed up to 10 feet off the road, and the BLM could designate specific closed roads for use by individuals with disabilities, based on demand or on a case-by-case basis. Access for recreationists could be substantially limited under this alternative.

Six of the 10 existing backcountry airstrips could remain open; but only two would be open yearlong. People who use these airstrips may feel the loss of many options they previously enjoyed.

Alternative E

Less than 1/5 of the BLM road mileage would be available yearlong. This is the most restrictive alternative in terms of what would be allowed, and some people would feel their options to be severely limited.

No additional access to BLM lands would be acquired and no off-road camping would be allowed. Some recreationists and hunters could have their activities severely restricted. Some roads could be limited to specific motorized and/or mechanized use. The BLM could designate specific closed roads for use by individuals with disabilities, based on demand or on a case-by-case basis.

No backcountry airstrips would remain open and those who use these airstrips would have all their options eliminated in this area.

Alternative F (Preferred Alternative)

About 1/3 of the BLM road mileage would be available yearlong. Roads would be closed to address resource concerns. Some roads commonly used for dispersed recreation would remain open. Some people would feel these road closures would be important to protect wildlife. Others who use these roads for activities other than lease maintenance, would lose the option to use some roads they previously had available to them.

Some closed roads could be designated for mechanized use such as mountain bikes; the BLM would attempt to acquire access where no legal public access exists; motorized or mechanized vehicles would be allowed to pull off 300 feet (outside wilderness study areas) to camp; and game retrieval would be allowed from 10 a.m. to 2 p.m. on some designated roads. The latter two provisions would provide more opportunities for the aging public. However, there is concern that it would be difficult to enforce these activities and that some people would use them as an excuse to drive on closed roads. In addition, if the need arises, the BLM could identify specific designated closed roads as access for individuals with disabilities.

Effects to backcountry airstrip users would be the same as Alternative D.

Summary of Cumulative Impacts to Social

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Alternatives A, B, and parts of C are most responsive to the desires of individuals and groups who feel Monument management should continue as it has in the past. They address the concerns of those who want to maintain roaded access, and those who would give a high priority to resource use, and could enhance the social wellbeing of all these groups and individuals. Opportunities for motorized recreation predominate under these alternatives. Game retrieval by motorized vehicle would be the most liberal, which could provide options as the population ages. Livestock permittees would continue to access their allotments as they have in the past and resource reserve allotments could allow added management flexibility. Individuals and groups who desire a primitive, quiet recreation experience would not feel these opportunities are available. They may also feel these alternatives do not offer the ability to address current or future problems. Social wellbeing for these groups and individuals may decline under these alternatives.

Alternatives D and F (Preferred Alternative) are less responsive to the desires of individuals who feel public land management should continue as it has in the past, those who want more roaded access and those who would give a high priority to resource use. The social wellbeing of the above groups and individuals could decline under these alternatives. Most activities would be allowed under these alternatives, but may be restricted to specific areas or seasons. These alternatives would lay the groundwork to address current and future issues as they emerge. Opportunities to retrieve game by motorized vehicles would be less numerous than under Alternatives A, B, and C, but would still provide some opportunities for hunters as the population ages. Livestock permittees would continue to access their allotments with minimal restrictions and resource reserve allotments could allow added management flexibility. Opportunities for motorized recreation would decline relative to Alternatives A, B and C, and opportunities for primitive, quiet experiences would be enhanced. Individuals and groups who would give a high priority to resource protection would feel this is accomplished under these alternatives, which could enhance their social wellbeing. Recreationists who prefer primitive experiences would appreciate the motorized watercraft prohibition on miles 95.2 to 149 during the core season; other recreationists may feel this prohibition is too restrictive.

Under Alternative E, activities in the Monument would be more restricted than under any other alternative. This alternative is least responsive to the desires of individuals who feel Monument management should continue as it has in the past, those who want more roaded access and those who would give a high priority to resource use. The social wellbeing of the above groups and individuals could decline under these alternatives. Opportunities to retrieve game by motorized vehicle would be the most restricted of all the alternatives and would not provide opportunities for hunters as the population ages. Livestock permittees' access to their allotments would be somewhat limited and other restrictions would be imposed which could make management of livestock and range improvements more difficult. Individuals and groups who want a primitive, quiet experience, would feel these opportunities are available. However, they may also feel that the proposed restrictions under this alternative would be too extreme.

Under Alternative A, the BLM would encourage, but not participate in the development of staffed sites in gateway communities to provide visitor information and would not receive the benefit these partnerships could create. Under Alternatives B, C, D, and F, the BLM would strive to develop staffed sites or partner with gateway communities in Big Sandy, Chinook and Winifred to provide visitor information. This could enhance relationships between recreationists and residents, and provide tourist-related economic opportunities for local residents. These effects could, in turn, enhance social wellbeing for all affected parties. Under Alternative E, the BLM would not develop staffed sites for visitor information or strive to partner with the gateway communities of Big Sandy, Chinook and Winifred, but would provide visitor information to the local communities. This could preclude enhancing the relationships between local communities and recreationists.

Economics

Impacts to Economics

Introduction

A basic assumption in this analysis, with a few exceptions, is that the natural resources contained within the Monument would not be reallocated to different uses as a result of the management plan, and that the relationship between the Monument resources and the economy of the area would continue as it has in the past. The Proclamation establishing the Monument emphasizes the continuation of existing rights in a manner that does not create any new impacts that would interfere with the proper care and management of the objects protected by the Proclamation. The current condition and alternatives being considered do not reallocate resources (reallocate lands covered by grazing permits to other uses) but deal with changing management direction in a manner that responds to the goals and objectives set forth in the planning process.

Current levels and recent trends in employment, personal income, and population are described in Chapter 3. The alternatives focus on management direction and essentially maintain the status quo in the allocation of Monument resources. Thus, current direction and the alternatives provide essentially the same opportunities for economic growth, employment and unemployment, payments in lieu of taxes, gas road taxes and county property taxes. That is, the current direction and alternatives to it would not influence these economic factors.

During the period 1991 to 2000, employment in the study area grew by 8%. This was a significant increase over past trends for the area, but still below state and national trends. There are no forces apparent at this time that would indicate a change in this trend with respect to its relationship to state and national trends.

Inflation adjusted personal income in the study area declined by over 4% between 1991 and 2000, with the largest contributing factor being declines in farm income. Fluctuations in farm income tend to reflect changes in market prices and costs, factors that will not be influenced by current direction or the alternatives to it.

Payments in lieu of taxes are calculated by formulas which would not be affected by the management plan. None of the direction related to the transportation system would affect the miles of gas tax roads in the Monument. None of the direction would affect property values and the property tax base or change revenue to local entities.

Impacts to Economics Common to All Alternatives

As mentioned above, there are a few exceptions where alternatives may affect resource users. The users most likely to be affected are those using grazing, recreation, and natural gas. Also, there would be potential differences in BLM management costs associated with some alternative direction.

Ranching

In 2002, the Monument grazing allotments provided an estimated 37,000 AUMs. In 2002, there were 203,000 beef cows and heifers that had calved on ranches in the study area.[1] The forage provided by Monument grazing allotments represents about 1% of the nutritional needs for cattle in the study area. Changes in forage availability would not create a measurable effect on ranching in the study area, but some individuals with grazing allotments within the Monument may have to make minor adjustments in their operation in response to some of the direction in the alternatives.

Recreation and Tourism

In the uplands section of the Monument, the supply of recreational activities exceeds the current and near future demand for these opportunities. The changes in management direction in the alternatives would not materially affect this relationship. However, some changes in management direction for the wild and scenic river portion could affect river users, including outfitters and guides and recreationists. For example, the use of fire pans, limiting travel at certain times, etc. could result in inconveniences and/or very small changes in costs.

Natural Gas

The Proclamation states "The Secretary of the Interior shall manage development on existing oil and gas leases with in the Monument, subject to valid existing rights, so as not to create any new impacts that would interfere with the proper care and management of the objects protected by this proclamation." The potential for development of new wells in the Monument exists. The current direction and the direction in the alternatives differ in how this development could take place in terms of location and what constitutes proper care and management. There may be small costs to the leaseholder associated with restrictions in location and with modifying their management practices. The effect of these differences would fall on the leaseholder and would not likely create measurable effects in the study area economy. However, there may be some changes in the cost of development and operation for individual leaseholders as management direction changes.

Government Expenditures

The costs of managing the Monument may change under a new management plan. There are provisions in the alternatives that could increase costs associated with road maintenance, recreation administration, law enforcement, etc. These provisions would be funded through a budgeting and appropriations process. Predicting actual funding levels from this process is speculative.

Impacts to Economics from Health of the Land and Fire

Protection of sage-grouse habitat under Alternatives B through F may change grazing management practices compared to Alternative A. This could increase costs and/or reduce income to the permittee. These changes would be very small as there are few sage-grouse leks involved. Also, there could potentially be some increase in costs to the government to implement the various practices in the alternatives that are different from Alternative A.

[1] Montana Agricultural Statistics, 2002

Impacts to Economics from Visitor Use, Services, and Infrastructure

Under Alternative A, recreation in the Monument would be managed with four recreation management areas, under Alternatives B through F recreation would be managed under two recreation management areas. These two areas would consist of the Missouri River portion of the Monument and the uplands portion of the Monument. This would streamline both the planning and the management functions for the Monument and should result in a reduction in costs to the government. While the change in costs may not be large, once implemented they would be permanent.

Under Alternative B, no recreation user fees would be charged for overnight camping at developed recreation sites. In Alternative A, a fee of $6 per vehicle would be charged for camping overnight at the James Kipp Recreation Area. An average of $15,000 per year is collected under Alternative A. This revenue would be permanently lost under Alternative B. Alternative C would be no different than Alternative A. For Alternatives D through F, effects on revenues cannot be determined at this time.

Special recreation use permits for commercial recreation activities on the Missouri River would be limited to 23 under Alternatives A and F and to 30 permits under Alternatives C and D. Alternative B would not limit permits, and essentially allows businesses to seek a permit based on market conditions for outfitted trips on the river. From an economic efficiency perspective, restricting entry into a market tends to reduce the efficiency of the market. Thus Alternatives A and C through F would reduce market efficiency.

The special recreation permits for commercial hunting in the uplands also have alternatives that limit the number of permits that could be issued and some alternatives restrict the areas where the permit is valid. Alternatives A, B, D and E would not limit the number of permits that could be issued, while Alternatives C and F would limit the number that can be issued to the current number of outfitters with permits. Alternatives B and C would have no restrictions on where the permit is valid. Alternatives A, D, and E would assign a specific geographic area or areas to each permit, while Alternative F would assign areas based on existing use areas/leases.

As discussed above, limiting the number of permits issued restricts market entry and reduces economic efficiency. Assigning specific areas to specific permits is a further market restriction in that it limits the area in which outfitters can offer their services. In this case Alternative B would be the least restrictive in terms of economic efficiency, and Alternatives A, C, D, and E would be less restrictive than Alternative F, which would be the most restrictive.

Impacts to Economics from Natural Gas Exploration and Development

The reasonable foreseeable natural gas wells associated with the alternatives would have different effects on output, employment and labor income in the regional economy. Producing natural gas wells do not have either uniform production rates over time nor do they have equal producing lives over time. To facilitate the comparison of alternatives, gas production was converted to an average annual basis.

Alternative A reflects what would happen if current management were followed into the future. The foreseeable natural gas wells associated with Alternative A would support $5.7 million dollars in average annual output, 36 jobs, and over $1.1 million dollars in labor income. It should be noted that over $4 million of the output is the value of the natural gas produced, and most of this $4 million would be exported from the area and little, if any, retained in the area. The amounts supported would be equal to about 0.4% of the total output and 0.2% of employment and labor income in the regional economy.

Alternatives B, C, D, and E would follow different levels of foreseeable natural gas wells. Alternative F would be similar to Alternative A. The different economic effects created by these natural gas wells when compared to Alternative A are shown in Table 4.36.

Table 4.36
The Change in Output, Employment, and Labor Income in the Regional Economy for Alternatives B, C, D, E, and F (Preferred Alternative), 2000

	Alt. B	*Alt. C*	*Alt. D*	*Alt. E*	*Alt. F*
Change in Output (million $)	+$1.4	-$0.7	-$2.1	-$3.5	-$0.09
Change in Employment (jobs)	+9	-4	-14	-22	-1
Change in Labor Income (million $)	+$0.19	-$0.12	-$0.39	-$0.65	-$0.02
Change in Royalties (thousand $)	+$91	-$58	-$191	-$316	-$8
Change in Disbursements (thousand $)	+$46	-$29	-$96	$158	-$4

Source: 2000 IMPLAN data from Minnesota IMPLAN Group, Inc., with modifications by NEA; RFD Projections; and Minerals Management Service data.

Alternative B would support more output, employment, and labor income in the regional economy than Alternative A. Alternatives C, D, and E would support less output, employment, and labor income in the regional economy than Alternative A. Alternative F is almost identical to Alternative A in its economic effects. As discussed above, these amounts represent only a very small fraction of output, employment and labor income in the regional economy. The royalties to the federal government and disbursements to the state are average annual values for the life of the well.

Summary of Cumulative Impacts to Economics

Alternatives A (Current Management), B, C, D, E, and F (Preferred Alternative)

Changes in forage availability would not create a measurable effect on ranching in the study area, but some individuals with grazing allotments within the Monument may have to make minor adjustments in their operation in response to some of the direction in the alternatives.

In the uplands section of the Monument, the supply of recreational activities exceeds the current and near future demand for these opportunities. The changes in management direction in the alternatives would not materially affect this relationship. However, some changes in management direction for the wild and scenic river portion could affect river users, including outfitters and guides and recreationists.

Natural gas operations would affect output, employment, and labor income in the regional economy but the change only represents a very small fraction of the economy as discussed under natural gas exploration and development.

Unavoidable Adverse Impacts

Soils

Areas that are not successfully reclaimed from surface-disturbing activities, could have excessive soil erosion, which would be considered adverse when soil productivity is affected and sedimentation occurs to the extent that water quality is degraded. Unauthorized activities, such as off-road travel, could lead to soil compaction and a subsequent increase in surface runoff and soil erosion.

Vegetation – Native Plants

There would be minimal impacts to vegetation that cannot be avoided with appropriate mitigation measures as included within the alternatives.

Short-Term Use versus Long-Term Productivity

Soils

Most surface-disturbing activities result in short-term localized soil impacts, except for areas of continual use (i.e. roads, recreational areas, natural gas production areas) that require a long-term commitment of soil resources. Soil impacts include soil erosion, sedimentation and site instability. After reclamation and revegetation, long-term soil productivity, stability and site production would return.

Vegetation – Native Plants

Some short-term uses (roads, gas development facilities, and recreation activities) would influence vegetation on a localized basis; however, the long-term vegetation productivity does not differ from one alternative to the other.

Livestock Grazing

There could be some short-term losses in forage available for livestock grazing and inconvenience to accommodate other activities (recreation, gas development, prescription burning, wildlife habitat, etc). These losses would be relatively small and with mitigation measures, in the long-term, are likely to sustain or increase productivity.

Irreversible and Irretrievable Commitment of Resources

Soils

If mitigating measures are ineffective in controlling erosion, there would be an irreversible and irretrievable commitment of the soil resource. Excessive soil erosion resulting in sediment entering surface waters would be an irreversible and irretrievable impact.