

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 (Chapter 3 provides 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 2.42 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 reasonable foreseeable development scenario for 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-way, 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.

Climate

The assessment of greenhouse gas emissions and climate change is in its formative phase; therefore, it is not yet possible to know with confidence the net impacts to climate. However, the Intergovernmental Panel on Climate Change (IPCC 2007) recently stated that “[w]arming of the climate system is unequivocal . . .” and that “[m]ost of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic [man-made] greenhouse gas concentrations.”

The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. For example, potential impacts to air quality resulting from climate change are likely to be varied. If global climate change results in a warmer and drier climate, increased particulate matter could occur as a result of increased windblown dust from drier and less stable soils. Cool season plant species’ ranges could potentially move north and due to the potential loss of habitat, or from competition from other species whose ranges shift northward, the population of some animal species could change.

Many of the models needed to make effective decisions at the local and regional levels have not been developed. The Department of the Interior is exploring whether global and regional climate modeling can be scaled to the point that it can be used to manage parks and refuges (GAO-07-863, 2007). When further information on the impacts to climate change is known, such information would be considered in the implementation of this plan as appropriate.

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.

Federal undertakings and unauthorized uses have the potential to cause irreversible disturbance and damage to nonrenewable cultural resources. The BLM would continue to mitigate impacts to cultural resources from authorized uses through project abandonment, redesign, and if necessary, data recovery investigations in accordance with the BLM National Cultural Programmatic Agreement and the Protocol for Managing Cultural Resources on Land Administered by the BLM in Montana.

Without a 100% inventory of all BLM land in the Monument, the exact number, kind, and variability of cultural resources will be unknown. However, new cultural resources would continue to be found and evaluated for eligibility to the National Register of Historic Places as additional inventories are completed for compliance projects. Eligible cultural resources would continue to be treated similarly and equally in terms of type, composition, and importance, but many would continue to deteriorate through natural agents, unauthorized public use, and vandalism. The BLM would continue to consult with American Indian Tribes on traditional cultural properties and values that are of concern to them.

All archaeological resources will be assessed according to BLM use categories. The demand for use of cultural resources is expected to increase over the life of the plan. Interest from the general public in historical tourism and from American Indians for traditional uses is expected to increase. The demand by the academic community to use cultural resources in scientific research would be expected to remain at current levels.

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.

The Management Plan and Conservation Strategies for Sage Grouse in Montana (Montana Sage Grouse Work Group 2005) states that human activities, including flushing birds during nesting and brood rearing by mechanical vehicles, could lead to mortality from

predation, accidents, or other proximal causes. 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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). This requires behavior that emphasizes energy conservation. Protection of greater sage-grouse and breeding, nesting, and winter habitat could promote sage-grouse survival.

Allowing above-ground structures may cause sage-grouse to avoid these areas, reducing the available habitat for this species. California Fish & Game documented abandonment of all sage-grouse leks within 2.2 kilometers and significant declines out to 5 kilometers from placement of overhead power lines and towers (Frank Hall, pers. comm. 2002). This included visual response to towers which were installed with anti-perch devices to prevent use by raptors for roosting.

Continuous use by domestic livestock and wild ungulates might not leave suitable cover or maintain the site potential for seasonal or yearlong habitats used by sage-grouse. Grazing affects sagebrush-grassland habitats through its direct effect on plants and indirect effects on soil and microclimate (Beck and Mitchell 2000). Through literature review, Beck and Mitchell identified both positive and negative direct effects of livestock grazing on sage-grouse habitat. Light to moderate grazing by cattle or managed grazing systems can improve quantity and quality of summer forage, i.e., forbs, for sage-grouse. Heavy to severe overgrazing reduces habitat quality, which may lead to increased nest predation or nest desertion, or may pre-empt use of a site by grouse altogether (Beck and Mitchell 2000). Residual grass cover following grazing is essential to maintaining the quality of nesting habitat. (Montana Sage Grouse Work Group 2005).

Both burning and spraying can reduce or adversely alter the composition of herbaceous understory and shrub

canopy (Connelly et al. 2000, Wambolt et al. 2002). Risks to sage from fire include loss of sagebrush canopy on breeding, brood rearing, and winter habitats (Montana Sage Grouse Work Group 2005).

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 provide roosting structure for raptors which may cause prairie dogs and some ground nesting and roosting birds to avoid these areas, reducing the available habitat for these specialized species.

Designated Sensitive Species

Virtually all bird species are susceptible to disturbance on nesting sites (Jalkotzy et al. 1997). 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. In a study of ferruginous hawks, new forms of disturbance caused desertion if sustained. In this study, individuals did not habituate to human presence (Jalkotzy et al. 1997).

Increased traffic into an area may reduce security to ground nesting species and the nesting success of the birds in the immediate area. Passerines are also affected by human disturbances and the avoidance of disturbance corridors like roads have been well documented (Jalkotzy et al. 1997). Allowing above-ground structures may cause some ground nesting and roosting birds to avoid these areas, reducing the available habitat for these specialized species.

Ingelfinger (2001) found that regardless of traffic volume, density of sagebrush obligate passerine birds is reduced within 100 meters of roads associated with natural gas development. It is likely that along such roads, birds are responding to noise and dust created by traffic.

The short-horned lizard and prairie rattlesnakes are closely associated with badlands habitat and are readily impacted by alteration of habitat, especially roads which go into badlands (Joel Nicholson, pers. comm. 2000). Roads allow travel to areas of unsuitable habitat where individuals are at greater risk, and use of roads results in road kills. The western hog-nosed snake is associated with sandy or gravel sites in the badland and grassland area and is considered uncommon, but very little is known about its status in Montana as sightings are uncommon. Impacts would be the same as the rattlesnake. Reptiles seek roads for thermal cooling and heating, and in doing so, these species experience

significant, chronic mortality from motorized vehicles. Roads with moderate rates of motorized traffic may function as population sinks for many species of reptiles, resulting in reduced population sizes and increased isolation of populations (USFS 2001).

Black-footed Ferret

The black-footed ferret was listed as an endangered species on March 11, 1967, due to a variety of factors. Widespread poisoning of prairie dogs and agricultural cultivation of their habitat drastically reduced prairie dog abundance and distribution in the last century. Sylvatic plague, which may have been introduced to North America around the turn of the century, also decimated prairie dog populations, particularly in the southern portions of their range. The severe decline of prairie dogs resulted in a concomitant and near-fatal decline in black-footed ferrets, though the latter's decline may be partially attributable to other factors such as secondary poisoning from prairie dog toxicants (e.g., strychnine) and high susceptibility to canine distemper and sylvatic plague.

Black-footed ferrets depend almost exclusively on prairie dogs and prairie dog towns for food and shelter (Henderson et al. 1969, Forrest et al. 1985) and ferret range is coincident with that of prairie dogs (Anderson et al. 1986). No documentation exists of black-footed ferrets breeding outside prairie dog colonies. Black-footed ferrets do not dig their own burrows and rely on abandoned prairie dog burrows for shelter. It is likely that only large complexes (several thousand acres of closely spaced colonies) can support and sustain a breeding population of black-footed ferrets. It has been estimated that about 40 to 60 hectares of prairie dog colony is needed to support one ferret, and females with litters have never been found on colonies less than 49 hectares (Miller et al. 1996). Based on this species' dependence on prairie dog colonies, it can be assumed that any action that reduces prairie dog numbers on colonies which provide suitable habitat for ferrets, could impact black-footed ferrets.

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.

During egg-laying and incubation, eagles are most vulnerable to disturbance. Human disturbances during this time may cause birds to temporarily leave the nest and allow eggs to cool, or to desert nests altogether. Disturbance could cause the failure of nests, reducing the

productivity of the bald eagle, which was recently delisted as a threatened species but is protected under the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and as a designated sensitive species. After the eggs have hatched, adult eagles are less likely to abandon nest areas. Hatching and rearing of young generally takes place from early May to mid-August. Fledging generally occurs from mid-June through mid-August. After fledging, nesting bald eagles are the least sensitive to human activities (Montana Bald Eagle Working Group 1994).

Bald eagles are susceptible to disturbance during winter roosting in severe weather and temperatures (Montana Bald Eagle Working Group 1994). 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.

Pallid Sturgeon

Dams are assumed responsible for the pallid sturgeon's decline by isolating pallid sturgeon populations, altering flow regimes, and reducing habitat (USFWS 1993a). The pallid sturgeon populations in Montana are senescent, with no evidence of recent recruitment and are in danger of going extinct. Hybridization with shovelnose sturgeon (*Scaphirhynchus platorynchus*) may also be a problem. Based on high natural turbidity of Missouri River water, it is unlikely that any human action in the upland or in the river channel can create a sediment load which would negatively affect pallid sturgeon (Gardner, pers. comm. 2002).

Floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters formed the large river ecosystem that provided macro invertebrate requirements for pallid sturgeon and other large-river fish, such as paddlefish and other sturgeon (USFWS 1993a). The floodplains were the major source of organic matter, sediments, and woody debris for the main stem rivers when flood flows crested the river's banks (USFWS 1993a). Macro invertebrates provide a large percentage of pallid sturgeon diets (Carlson et al. 1985; Gardner and Stewart 1987; from USFWS 1993a). Negative indirect effects may result from a reduced forage base. Some loss of macro invertebrate food base could occur from construction in or disturbance to the riverbed, which could kill aquatic organisms excavated from the river and bury others. There is a small risk from sport fishermen who may confuse the pallid with the more plentiful shovelnose sturgeon (Gilge, pers. com. 2004).

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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). 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.

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.

Minerals – Oil and Gas

The Reasonable Foreseeable Development (RFD) scenario for natural gas exploration and development is contained in Appendix O.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. 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.

Table 4.1 Reasonable 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
<i>Acres</i>	39.9	51.1	33.1	14	0	38.3
Roads (miles)	10	17.4	12.4	0.4	0	11.1
<i>Acres</i>	17.0	29.5	12.4	0.6	0	18.8
Pipelines (miles)	3.5	6.1	9.3	0.1	0	3.9
<i>Acres</i>	12.8	22.1	9.3	0.4	0	14.2
<i>Total Acres</i>	69.7	102.7	54.8	15.0	0	71.3
Other (within 1/2 Mile of the Monument)						
Wells (No.)	21	23	21	20	18	21
<i>Acres</i>	24.5	26.6	24.5	23.4	21.1	24.5
Roads (miles)	4.0	4.4	4.1	4.0	4.0	4.0
<i>Acres</i>	6.8	7.4	7.0	6.8	6.8	6.8
Pipelines (miles)	1.4	1.5	1.4	1.4	1.4	1.4
<i>Acres</i>	5.1	5.6	5.2	5.1	5.1	5.1
<i>Total Acres</i>	36.4	39.6	36.7	35.3	33.0	36.4
Total						
Wells (No.)	56	67	49	33	18	55
<i>Acres</i>	64.4	77.7	57.6	37.4	21.1	62.8
Roads (miles)	14.0	21.8	16.5	4.4	4.0	15.1
<i>Acres</i>	23.8	36.9	19.4	7.4	6.8	25.6
Pipelines (miles)	4.9	7.6	10.7	1.5	1.4	5.3
<i>Acres</i>	17.9	27.7	14.5	5.5	5.1	19.3
<i>Total Acres</i>	106.1	142.3	91.5	50.3	33.0	107.7
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

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, and another increase in 1999 to 5,442 visitors. The highest use occurred in 2003 with 6,034 registered boaters, and that number has gradually decreased to 5,498 registered boaters in 2006. Visitor use during the 1999 to 2006 timeframe has stayed relatively flat, with an average of 5,633 registered boaters each year. See Figure 3.10 for visitor use numbers from 1975 through 2006.

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. An increase of 5% per year from 2006 to 2015 would result in the visitor use figures shown in Table 4.2.

<i>Year</i>	<i>Visitor Use</i>
2007	5,773
2008	6,062
2009	6,365
2010	6,683
2011	7,017
2012	7,368
2013	7,736
2014	8,123
2015	8,529
2016	8,956

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 MFWP to hunt various species. Currently, approximately 300 to

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.

Transportation

The transportation system will identify the roads needed to meet the objectives of the Monument consistent with 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.

The motorized traffic volume would remain low on the designated open (seasonally and yearlong) roads.

Fire Management

Fire history for the Monument during the 27-year period from 1980 through 2006 is displayed in Table 4.3.

<i>Area</i>	<i>Fires 1980-2006</i>	
	<i>Number</i>	<i>Acres</i>
Northern Portion	43	523
Southern Portion	43	2,552
Wild and Scenic River	19	612
WSAs and ACEC	39	4,290
Total	144	7,977

Most fires are the result of lightning. Approximately 10% of the acres burned are the result of human-caused fires. The BLM does not anticipate a noticeable increase in human-caused fires.

Social Conditions

For the social impact analysis, information from scoping and other planning documents, and discussions with people knowledgeable about the study area were used to develop a list of potentially affected groups and individuals, the concerns of these groups, and potential effects to these groups. Based on the concerns and potential effects, a set of indicators related to resource activity changes was developed for each set of potentially affected groups and individuals. The indicators were then examined by alternative for each group to determine the potential social effects. The potential social effects were then discussed with resource and other experts to determine the likelihood of the effects actually occurring to any given group.

No alternative would affect the demographics, major social trends, or social organization in the local communities of the planning area. In most cases, the social impacts are described in terms of effects to quality of life, which can be caused by changes in resource availability and use. These effects could include changes in 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 quality of life 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.

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

See Impacts to Social Conditions from Visitor Use, Services, and Infrastructure for assumptions related to upland and river recreation.

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. Management under any of the alternatives would protect the resources within the UMNWSR.

The designation of the Cow Creek Area of Critical Environmental Concern (ACEC) would not change under any of the alternatives. While the alternatives may affect some resources within the Cow Creek ACEC, 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.

The designation of the Lewis and Clark National Historic Trail would not change under any of the alternatives. Management under any of the alternatives would protect the resources along this historic trail.

The designation of the Nez Perce National Historic Trail would not change under any of the alternatives. Management under any of the alternatives would protect the resources along this historic trail.

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 dispersed quickly 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 flaring gas
- 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.

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 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 (EPA 1987).

During a seven-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 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.

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 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 have a combined total power rating less than 1,400 horsepower (Appendix O, RFD section regarding Drilling Phase). As both engine horsepower and operating periods increase, the likelihood for nitrogen oxide impacts 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. However, there is no known oil production in the Monument nor has hydrogen sulfide gas been discovered. The chance of emitting pollutants such as sulfur dioxide and volatile organic compounds is low to non-existent.

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 the road, asphalt paving and reducing vehicle speed. Watering of roads may reduce fugitive dust by about 50%; chemical suppressant achieves a 75-85% reduction; and oiling and asphalt

paving could achieve 90-95% control (MBOGC 1989). 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.

If five wells were drilled per year, this could yield up to 11 tons of emissions per year, assuming the drilling operation would produce 2.2 tons per well. If all 34 wells were drilled in one year, this still would fall below the threshold of 100 tons per year to require an air quality permit.

Carbon Monoxide (CO) Mitigation – Occasionally during well production and well testing, some carbon monoxide 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 per day (MCFPD) per year, the carbon monoxide emissions per well would average about 730 lbs. per year.

If five wells were drilled per year, assuming all five wells are productive and each produces 400 MCFPD for a two-day test, a total of 4,000 MCF (4,000 MCF x 0.02 lbs. CO per MCF) or 80 lbs. of emissions 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.)); however, 80 lbs. per year is well within the limit 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 and assuming it was powered by natural gas, it is estimated it would emit less than 100 lbs. per year of CO, 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 50 MMCF 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 could 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 dispersed quickly by winds. There are no known potential air quality impacts to the UL Bend Wilderness Area, a Class I airshed about 50 miles east of the Monument.

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 with the removal of vegetation and the creation of hydrophobic soils. 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. Protective measures applied during wildland fire suppression include identifying high probability areas so that they may be avoided when choosing camp locations, helispots, staging areas, and when constructing hand and dozer lines. Fire rehabilitation efforts would generally increase the protection of cultural deposits that may have remained unaffected from wildland fire by preventing or reducing

erosion and encouraging rapid revegetation of denuded surfaces. Potential impacts from rehabilitation activities (such as mechanical reseeding) would be mitigated under standard procedures.

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 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 from dispersed recreational activity (camping, hiking, horseback riding, mountain biking, rock climbing, etc.) are difficult to assess, particularly as such activities may impact cultural resources that have yet to be identified and recorded. Indirect and inadvertent impacts to cultural resources may occur by attracting additional attention or visitation to certain areas such as WSAs or ACECs. Increased visitation and recreational use can lead to the illegal collection of artifacts and vandalism. Providing recreational or public interpretation of cultural and historic resources may enhance appreciation and understanding of the fragile and finite nature of cultural resources. Similarly, promoting the adaptive reuse of historic buildings and structures for recreational purposes would help preserve and protect significant historic properties, helping fulfill the requirements of Section 110 of the National Historic Preservation Act (NHPA).

Since many of the roads in the Monument predate the 1966 National Historic Preservation Act, no cultural resource inventories were conducted to determine the potential effects created by the establishment of the roads. Subsequent to their creation, cultural resource inventories associated with other projects have identified cultural properties in and along road prisms. The identified sites will continue to be monitored to determine if the existence of the roads is affecting the sites, or if the level and types of use are having an effect. Nine sites with roads within the site boundaries have been identified.

Achieving the desired future condition for riparian vegetation and wetlands would be positive for cultural resources. Protection of cultural resources that occur in these fragile environments increases proportionally with the increase in the percent improvement towards proper functioning condition (PFC) of riparian/wetland habitats.

Grazing management which meets established Standards for Rangeland Health and Guidelines for Livestock Grazing Management should reduce the amount and

extent of impacts or damage to cultural resources resulting from grazing on public lands. While direct impacts associated with range improvement projects would be mitigated, other impacts may occur as a result of livestock grazing activities. Livestock congregation and trailing at or across cultural resource site locations can damage artifacts and the contexts in which they occur. Cattle shading and rubbing can damage standing historic structures and prehistoric pictograph panels. Excessive trampling at spring sources and along stream banks, cattle trailing, and overgrazing can all lead to a denuding of protective vegetation cover and create indirect impacts to cultural resources by accelerating natural erosion and exposing artifacts to illegal surface collection and vandalism. These types of impacts would generally be localized at particular site locations, and could range from short-term to long-term to irreversible. Since cattle loafing and trailing have the potential to affect cultural properties, range developments that have the potential to concentrate or attract livestock will be surveyed for cultural resources prior to the construction or placement of the development so that projects can be designed to avoid cultural resources, or effects could be mitigated.

Restrictions on development or activities enacted for the protection of other resources tend to favor the protection of cultural resources as well. Wildlife and riparian exclosures and recreational and oil and gas restrictions tend to stabilize and protect areas that may also contain cultural properties.

The issuance of rights-of-way that result in ground-disturbing activities has the potential to directly impact cultural resources, but impacts would be mitigated under standard avoidance or recovery procedures. Indirect or inadvertent impacts to cultural resources could result from the issuance of rights-of-way, but the overall risk to cultural resources from such impacts would be expected to be minimal.

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.

The designation of more acres as VRM Class I (49,780 acres) would enhance the opportunity to protect more cultural resources by reducing impacts on the ground. Additionally, with fewer impacts to the natural surroundings, sites which rely on integrity of setting and feeling would have stronger arguments for eligibility on the National Register of Historic Places.

Designating the Klabzuba Utility and Transportation Corridor in and of itself would have no effect on cultural resources. Individual proposals to utilize the corridor would continue to be evaluated for their potential to affect cultural resources. Recognizing the avoidance and exclusion areas would enhance the protection of cultural resources.

Alternative C

The impacts would be similar to Alternative B, except aggressive suppression would not be used in wilderness study areas and the VRM Class I designation would only increase by 300 acres. 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.

Designating the Klabzuba Utility and Transportation Corridor in and of itself would have no effect on cultural resources. Individual proposals to utilize the corridor would continue to be evaluated for their potential to affect cultural resources. Recognizing the avoidance and exclusion areas would enhance the protection of cultural resources.

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.

The designation of more acres as VRM Class I (49,780 acres) would enhance the opportunity to protect more

cultural resources by reducing impacts on the ground. Additionally, with fewer impacts to the natural surroundings, sites which rely on integrity of setting and feeling would have stronger arguments for eligibility on the National Register of Historic Places.

Designating the Klabzuba Utility and Transportation Corridor in and of itself would have no effect on cultural resources. Individual proposals to utilize the corridor would continue to be evaluated for their potential to affect cultural resources. Recognizing the avoidance and exclusion areas would enhance the protection of cultural resources.

Alternative E

The impacts would be the same as Alternative A. VRM effects would be the same as Alternative D.

Designating the Klabzuba Utility and Transportation Corridor in and of itself would have no effect on cultural resources. Individual proposals to utilize the corridor would continue to be evaluated for their potential to affect cultural resources. Recognizing the avoidance and exclusion areas would enhance the protection of cultural resources.

Alternative F (Preferred Alternative)

Fire is a component of the natural environment that 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.

The designation of more acres as VRM Class I (49,780 acres) would enhance the opportunity to protect more cultural resources by reducing impacts on the ground. Additionally, with fewer impacts to the natural surroundings, sites which rely on integrity of setting and feeling would have stronger arguments for eligibility on the National Register of Historic Places.

Designating the Klabzuba Utility and Transportation Corridor in and of itself would have no effect on cultural resources. Individual proposals to utilize the corridor would continue to be evaluated for their potential to affect cultural resources. Recognizing the avoidance and exclusion areas would enhance the protection of cultural resources.

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. Increased interpretation has the potential to concentrate traffic (pedestrian and motorized), which may in turn increase visible use. Proper placement of signs also has the potential to concentrate visitors away from areas susceptible to erosion or vandalism, while at the same time educating visitors of the significance and fragile nature of the objects of the Monument. 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.

Requiring camp stoves, fire pans or fire mats for dispersed camping (Level 4 opportunities) would reduce the potential to affect documented and unidentified prehistoric sites. Stones that form tepee rings and other

stone features (i.e., cairns, trail markers, etc.) would not be taken to form fire rings.

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.

Requiring camp stoves, fire pans or fire mats for dispersed camping (Level 4 opportunities) would reduce the potential to affect documented and unidentified prehistoric sites. Stones that form tepee rings and other stone features (i.e., cairns, trail markers, etc.) would not be taken to form fire rings.

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.

Encouraging the use of camp stoves, fire pans or fire mats for dispersed camping (Level 4 opportunities) would reduce the potential to affect documented and unidentified prehistoric sites, but not as much as requiring their use in Alternatives C, D, and E. Stones that form tepee rings and other stone features (i.e., cairns, trail markers, etc.) would not be taken to form fire rings.

Impacts to Cultural Resources from Natural Gas Exploration and Development

Alternatives A (Current Management), B, C, D, 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 lower site density than the area along the river (as discussed in Chapter 3).

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 and been evaluated regarding their effects on cultural resources.

Alternative E

Development of non-West HiLine 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 lower site density than the area along the river (as discussed in Chapter 3).

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 and been evaluated regarding their effects on cultural resources.

For the West HiLine leases, surface disturbance would not be allowed on any portion of the leases regardless if the land is inside or outside the Monument. This includes the entire leasehold (12,782 acres). APDs on these leases would not be processed. The decision to not allow APDs to be processed would have no effect on cultural resources.

Alternative E_{NL}

This sub-alternative considers the environmental effects of not leasing the 12 West HiLine leases. The effects to cultural resources would be the same as those from Alternative E, which would not allow surface-disturbing and disruptive activities on any of the 12 West HiLine oil

and gas leases regardless if the land is inside or outside the Monument. This includes the entire leasehold (12,782 acres). The decision to not lease would have no effect on cultural resources.

Impacts to Cultural Resources from Access and Transportation

Alternatives A (Current Management) and B

Roads within the Monument improve access to some cultural properties. Improved access may increase visitation and appreciation for some cultural properties, and could also facilitate the use of traditional locations by American Indians. Improved access may also lead to increased erosion and vandalism of some cultural properties. Open roads used during wet periods may grow in width through avoidance of muddy or deeply rutted stretches, which may lead to increased ground disturbance and increase the risk to prehistoric sites and historic ruins adjacent to travel routes. If the BLM does propose any new routes or road relocations the proposals would receive cultural resource inventories in compliance with Section 106 of the National Historic Preservation Act. This would apply regardless of the reason the road is created (i.e., oil and gas exploration, private rights-of-way, road reroutes/relocations for other resource protection).

Nine cultural resource sites have local or resource roads within their boundaries. Roads often expose sites within the treads where the vegetation is removed or when erosion occurs. Since none of the sites were documented prior to the use or designation of the roads, the condition of these sites prior to potential road effects is uncertain. Since none of the roads that pass through the sites are proposed for closure under Alternative A, all of the sites would be placed on a monitoring rotation to determine the sites' eligibility and the effects of the road and road use on the sites. With 19 more miles of roads proposed to be closed in Alternative B there is less chance of road and road use impacts on cultural resources.

All 10 airstrips would remain open under both alternatives. Six of the 10 may be more than 50 years old; they have yet to be evaluated for their eligibility on the National Register of Historic Places. Continued use of the airstrips would serve to preserve them.

Under Alternative A motorized or mechanized vehicles may not pull off existing roads for camping. This action has no effect on cultural resources. Alternative B allows motorized or mechanized vehicles to pull off designated open roads no more than 300 feet for camping. The effects from this decision are unknown since the BLM has not inventoried all areas within this 600-foot corridor. The potential exists for vehicle traffic and associated camping activities to affect cultural resources,

particularly prehistoric sites. Possible effects include artifact displacement, breakage, compaction, and stratigraphic mixing of various cultural assemblages, as well as increased erosion potential, site exposure, and vandalism.

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 interpretive benefits from acquiring new access. Alternatives C, D, and E all propose to close more roads than Alternatives A and B. The reduction in open road miles would reduce the erosion and vandalism potential to cultural resources that may be located in or along roads. The amount of road closures in Alternative E has the greatest potential to beneficially affect cultural resources.

Under Alternatives C, D, and E, the Black Butte South airstrip would be closed. This airstrip is at least 50 years old. Alternative E would close all 10 airstrips, six of them being over 50 years old. For historic buildings and sites generally the best way to preserve them is to use them. Even though these airstrips have not been evaluated for their eligibility for listing on the National Register of Historic Places the same logic holds true. Abandoning the six airstrips dating to the 1950s could in time lead to their eventual removal from the landscape. Since none of the 1950s-era airstrips have constructed features, and no rehabilitation work is proposed with the closure, closing these airstrips should have no effect on any integrity or significance factors that may have qualified these airstrips for the National Register.

Under Alternative C motorized or mechanized vehicles may pull off designated open roads no more than 150 feet for camping and must use the most direct route to minimize resource damage. Effects to cultural resources would be similar to those under Alternative B, with only half the potential to affect cultural resources. Under Alternative D motorized or mechanized vehicles may pull off designated roads no more than 10 feet for camping. This generally falls within the areas disturbed when the roads were developed, so impacts would be negligibly different from the use of the existing roads. Alternative E would not allow motorized or mechanized vehicles to pull off designated roads for camping, thus creating no added impact on the resources.

Alternative F (Preferred Alternative)

Restricting vehicular access on some roads and proper design and placement of new access roads could help protect cultural properties. Seasonal restrictions tend to reduce the amount of motorized traffic during wet and muddy conditions. Effects caused by motorized traffic include artifact displacement from erosion, as well as

from artifacts within roadbeds that get transported in mud stuck to vehicle tires. Also, wet and muddy-weather travel causes increased road braiding as drivers attempt to miss mud holes and find traction on existing vegetation. Driving off the established routes increases the opportunities to affect documented as well as unidentified cultural resources. Two roads that pass through two unevaluated prehistoric sites would be closed to all motorized access, reducing the direct effects on the sites as well as minimizing the erosion potential and the likelihood that the sites could be vandalized.

Six airstrips would remain open under this alternative. Two of the four slated to be closed are more than 50 years old; they have yet to be evaluated for their eligibility on the National Register of Historic Places. Abandoning the airstrips dating to the 1950s could in time lead to their eventual removal from the landscape. Since neither of the 1950s-era airstrips has constructed features, and no rehabilitation work is proposed with the closure, the action of closing these airstrips should have no effect on any integrity or significance factors that may have qualified these airstrips for the National Register.

Outside of the WSAs, motorized or mechanized vehicles may park adjacent to a road to provide a reasonable safe distance for the public to pass. However, parking must be within 50 feet of a road. Parking would be encouraged at previously used sites. In the WSAs, motorized or mechanized vehicles may only park immediately adjacent to a vehicle way or cherry-stem road. This generally falls within the areas disturbed when the roads were developed, so impacts would be negligibly different from the use of the existing roads. If parking were to occur 50 feet off the existing road impacts could occur similar to Alternative B, but the area of impact would be limited to 1/6 the potential area identified in that alternative.

Summary of Cumulative Impacts to Cultural Resources

Impacts to Cultural Resources Common to All Alternatives

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.

In general, fewer road miles equals less potential for direct and indirect impacts to cultural resource properties. The only qualifier to that assessment is when the road itself is the historic resource, and then maintaining the road without changing the characteristics that make it eligible for the National Register of Historic Places would be a better management strategy.

Alternative A (Current Management)

As stated above, 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 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 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 would be closed to protect sensitive resources.

Fish and Wildlife

Impacts to Fish and Wildlife Common to All Alternatives

Air Quality

Protecting and maintaining air quality will protect wildlife and wildlife habitat from conditions and

pollutants which may decrease health of individual animals or reduce quality of habitat.

Cultural

Management of cultural resources has the potential to affect wildlife and wildlife habitat in two ways. Any management which preserves a site and prohibits disturbance and use will provide additional protection for wildlife and wildlife habitat in the immediate area and along the access routes. Any management which allows access, disturbance, or use of wildlife habitat for other purposes has the potential to disturb wildlife and wildlife habitat. The impacts to wildlife and wildlife habitat would be varied, depending on scale and duration of the disturbance, amount of habitat disturbed, and the importance of that habitat and area to resident wildlife.

Fish and Wildlife

In general, management for wildlife and fisheries is intended to benefit most species but may target higher priority species, such as threatened and endangered, designated sensitive species, big game, game birds, sport fisheries, or species with limited habitat within the Monument.

Expansion of big game populations will be allowed within the ability of the habitat to support those populations, and within management goals of MFWP. MFWP is responsible for management of wildlife populations and BLM will work with them to ensure that available habitat is adequate to meet and maintain their population goals. This will benefit wildlife by allowing populations to expand within available habitat.

The BLM will use grazing methods, prescribed fire and mechanical alteration to maintain and improve habitat for all wildlife and other resources. These methods will vary based on habitat present, sensitivity of habitat to methods used, and wildlife present or being managed. Specific goals for sage-grouse, sharp-tail grouse, and big game species have been identified, with general guidelines to improve habitat for migratory birds as identified in the Non-game Migratory Bird Habitat Conservation Plan (BLM 1992b). The BLM will manage grazing and timber encroachment to improve the quality and quantity of nesting, brood rearing and winter habitat for upland game birds and will maintain sagebrush within suitable habitat with a canopy coverage of 15-30%.

Changes in vegetation can be used to manipulate vegetation to favor some species over others. Removal of timber (mechanically or by burning) may improve habitat for bighorn sheep, elk, mule deer, and sage-grouse, depending on conditions and location. Grazing can be used to manipulate herbaceous vegetation, including noxious weeds, to improve quality of forage or

structure of habitat for species ranging from reptiles, song birds, rodents all the way up to elk and bighorn sheep. The BLM will improve the quality and quantity of wildlife forage by using different grazing systems, changes in seasons of use, movement of livestock, and reductions in livestock numbers where needed to meet Standards for Rangeland Health. Management and manipulation of vegetation to improve vegetative health, vigor, species diversity, and structure is in itself intended to be a benefit to wildlife. Domestic sheep and goats have the potential to compete with, cause stress to, and introduce disease to wild sheep, when occurring in close proximity. Restricting grazing of domestic sheep and goats within 15 miles of bighorn sheep will help to avoid possible introduction of stress and disease to this important game species.

Habitat enhancements constructed or modified for wildlife or fisheries will benefit targeted species, and may also benefit many non-target wildlife species. A reservoir constructed for waterfowl or for livestock with waterfowl modifications included, will benefit many other species including big game, migratory birds, amphibians, shore birds, bats, and others. Modification or removal of a fence for mule deer will benefit all species which are impacted by the existing barrier. Fencing of a fishing reservoir will improve water quality for aquatic species and protect riparian vegetation, benefiting wildlife species who utilize that habitat type.

No action will be initiated on BLM land that will jeopardize any federally-listed threatened and endangered plant or animal. The BLM will work with the USFWS to recover threatened and endangered species, including reintroduction efforts consistent with recovery plans and conservation strategies. This includes the Recovery Plan for the Pallid Sturgeon (USFWS 1993a). Permitted actions for uses other than wildlife have potential to impact wildlife. Permitting rights-of-way (ROWs) may allow disturbance of wildlife or destruction of habitat. All raptor nest sites, including bald eagle nests, will be protected through spacing and timing stipulations and requiring of Avian Power Line Interaction Committee (APLIC) guidelines on overhead ROWs. No solar or wind generating facilities would be permitted in the Monument. In order to reduce risk to pallid sturgeon (endangered) and other fish, all ROW applications for pipelines that cross the Missouri River will include a condition that the pipeline be drilled under the river bed, avoiding disturbance to the river bed. Stipulations and restrictions identified for permitting actions such as ROWs, seismic permits, installation of range improvements, and oil and gas drilling will mitigate some of the identified impacts, with the goal of reducing those impacts to an acceptable level which will not impact total wildlife populations.

There will be impacts to fish and wildlife from impacts common to all alternatives, but most of these impacts are

beneficial. The remaining impacts are addressed through mitigation, protective stipulations, and management for Standards for Rangeland Health.

Geology

Mineral extraction causes surface disturbance of wildlife habitat through construction or excavation. Production causes disturbance through on-site activity and noise, vehicle access to and from a site, and vehicle strikes. The withdrawal of all Monument lands from mineral extraction will provide long-term protection of wildlife and wildlife habitat from the habitat destruction and disturbance associated with mineral extraction.

Soils

Maintaining or improving soil health will maintain productivity, which will benefit vegetation (a component of wildlife habitat, see the following Vegetation – Native Plants and Riparian section) and in turn will protect or improve wildlife habitat.

Vegetation – Native Plants and Riparian

Maintaining a diverse native vegetative community in different successional stages will benefit all wildlife species within the monument to varying degrees. Maintaining the health of these communities will benefit wildlife by providing the diverse habitat needs for nesting, forage, escape and thermal cover, and other habitat needs for these diverse species. By utilizing the Standards for Rangeland Health, resource managers will ensure that native vegetation, including riparian/wetland vegetation, continues to provide for the diverse vegetative and habitat needs of wildlife species within the Monument. Healthy riparian vegetation provides higher quality aquatic habitat for fisheries, amphibians, and some reptiles (turtles) by reducing water temperature, providing cover and aquatic substrate for nesting and feeding, and improving water quality.

Vegetation – Noxious and Invasive Plants

Noxious and invasive weeds degrade wildlife habitat by replacing native vegetation with less beneficial forage or cover. Controlling spread and removing these invasive and noxious species will benefit wildlife by protecting important forage and cover from being replaced by less desirable species.

Visual Resources

Limiting impacts through VRM classifications and contrast ratings will reduce impacts to wildlife habitat by restricting development in some areas and requiring minimal impacts in others. Any protection provided to wildlife habitat which restricts alteration in form and function of that habitat will benefit wildlife.

Water Quality

Degraded water quality can impact fisheries, aquatic invertebrates, and some water-dependent wildlife species. Reduced quality can impact aquatic invertebrate and fisheries by reducing or altering substrate needed for reproduction, and reducing forage base for other species. Maintaining water quality will continue to provide for and benefit species dependent on higher quality conditions.

Water Development and Water Rights

Water developments can benefit many species, including amphibians, waterfowl, bats, elk, bighorn sheep, pronghorn, and sage-grouse, by providing habitat or an additional component of habitat for a species. All developments do not provide the same benefits. Nor is water necessarily the limiting factor for any of these species in this geographic area. Water developments can cause impacts as well, by bringing livestock or other wildlife into areas that they did not occupy previously. They then compete with species which utilized the habitat prior to the water development. Construction of water developments can destroy individual wildlife and displace others. Depending on the scale of the development, this is usually short-term and minor if done with proper mitigation.

Reserved Water Rights

Any reservation of water rights which maintains stream flow will help to maintain spawning habitat for native fisheries and amphibians, and will help maintain healthy riparian vegetation and wildlife habitat along these streams. Riparian vegetation is some of the most productive and important habitat for many species of wildlife, notably migratory birds. This action has potential to preserve this habitat in better condition than would occur without maintaining water in these streams. Senior water rights to the BLM's still have potential to dewater these systems depending on flow and diversions.

Lands and Realty

The disturbance of lands and wildlife habitat for construction of ROWs can kill individuals, and cause disturbance and relocation of wildlife. Construction can destroy or alter habitat in ways which make it unsuitable for some species (e.g., an overhead power line in sage-grouse habitat, or change in vegetative community). Restriction on types of development (solar, wind, communications, farming) will limit future habitat alterations and disturbances to wildlife. Limitation of ROWs to identified transportation and utility corridors will limit alteration of habitat and disturbances to areas already cleared of major potential impacts, and will concentrate rather than disperse disturbance. Requiring drilling of pipelines under the Missouri River will greatly

reduce and possibly eliminate potential impacts from this action to pallid sturgeon and other fisheries. Requiring APLIC guidelines on any overhead power lines will substantially reduce the electrocution potential for raptors, including eagles. Consolidation of public lands will facilitate management for all resources, including wildlife, by reducing management conflicts between intermixed land owners. This action will benefit wildlife by providing limitations on development and protection of important habitat.

Livestock Grazing

Livestock grazing has potential to impact wildlife and wildlife habitat in both positive and negative ways. Overuse of herbaceous and shrub communities will impact many species as livestock compete for food and destroy escape and nesting cover or structure. Overuse of riparian vegetation can impact species dependent on riparian vegetation for food, nesting substrate and cover, and degrade water quality for aquatic species, invertebrates and fisheries.

High levels of grazing can be used to enhance habitat for species dependent on or adapted to short vegetation, bare ground or reduced cover. This includes species such as mountain plover and other short-grass prairie adapted bird species, prairie dogs and species associated with them, and some reptiles such as short-horned lizard, which prefers open habitat with low or absent ground cover to travel in search of food. Other species are dependent on vegetation of different heights and densities. Historically in this area, buffalo provided large swaths of heavily grazed habitat, benefiting many species, but also missed entire areas for years providing lightly or ungrazed areas for other wildlife. Overall, this provided a mosaic of different vegetative types in different successional stages throughout the area. As with disturbance caused by fire, some vegetative species and habitat types require at least periodic disturbance by large grazers to maintain their structure and health. Prairie grasslands and ponderosa pine woodlands are examples of habitat types dependent on outside influence to maintain successional levels and productivity. As many important wildlife species are also dependent on these habitat types, this disturbance can be used to improve wildlife habitat and maintain community health and diversity.

Utilizing Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997), BLM uses the expertise and knowledge of resource professionals in rangeland management, soils, vegetation, hydrology, and wildlife to make determinations of rangeland health. These determinations are made using available science and personal knowledge of resources, the capabilities of the local habitat, and wildlife resource needs within a management area. Wildlife needs are always a high

priority of these assessments and can often take priority over other resource needs. The need to maintain early successional vegetation for some wildlife species may require more intensive grazing in areas, with other areas requiring reduced grazing to meet specific habitat needs. Riparian vegetation will improve, which provides important wildlife habitat and improves water quality for fisheries and aquatic species.

With proper monitoring and management, livestock grazing is a valuable tool to manage wildlife habitat in an area such as the Monument that evolved with grazing by large animals.

Minerals – Oil and Gas

Oil and gas exploration, development, infrastructure, and production-related activity disturb and fragment wildlife habitat, cause mortality for individuals and disrupt wildlife activity and behavior. The closure of Monument lands to additional leasing will limit the amount and location of new disturbances to those areas already leased. The Proclamation and this RMP/EIS will require stricter standards for exploration, construction, production activities, and reclamation than may otherwise be required in order to protect the objects of the Monument. These requirements will reduce the impacts to wildlife and wildlife habitat over that which could occur outside of the Monument. Existing and future development on existing leases will continue to degrade wildlife habitat and affect wildlife within the areas already leased, even with proposed restrictions and BMPs. These impacts will continue until wells are abandoned, reclaimed to previous condition, and access to these sites is closed.

Recreation

All human use of wildlife habitat affects wildlife to some extent. The level, duration, type, and location of use will determine the level of impacts. People on foot, horseback, ATVs, or in vehicles all disturb wildlife, and vehicles can cause mortality of individuals through vehicle strikes. Any development of facilities will degrade habitat for wildlife. The level of impacts will vary by scale and location of development, and level of public use. Development of permanent facilities in high value wildlife habitat (riparian areas, nesting or fawning areas) will have the greatest impact. These impacts will occur for the life of the development, and due to human traffic and compaction from repeated use, it is unlikely that some of these areas can be returned to natural conditions after several years of use. Dispersed recreation causing wildlife disturbance can be short-term and would not cause long-term impacts. This activity could be restricted or reduced in a given area if impacts become unacceptable.

Transportation

All roads through wildlife habitat affect wildlife to some extent. The level, duration, type, and location of use will determine the level of impacts. Roads can physically destroy or fragment habitat. Traffic can disturb wildlife during stressful periods (breeding, nesting, fawning, brood rearing, on winter habitat), and kill individuals by vehicle strikes. Impacts can include dust and noise, causing movement of individuals, disrupting important activities, and loss of individuals to strikes, hunting and poaching. The impacts caused by the transportation network will continue as long as the access is available. Any road closures or seasonal closures will benefit wildlife by reducing direct and indirect impacts for those areas accessed by the existing road.

Fire Management

Fire, whether prescribed or wildland, will have both positive and negative impacts to wildlife species and their habitat. These impacts will vary based on location, season, duration, fire intensity, vegetation burned and individual species needs. Bighorn sheep, elk, mule deer, woodpecker and other cavity nesting birds will benefit from fires altering habitat under certain conditions. Nesting birds will be impacted by any fire occurring before young have fledged, but many species will benefit from fire-induced changes to habitat. Some species will not benefit from fire in this area. This would include sage-grouse which have undergone rapid habitat loss outside of the Monument. Responsible management of wildland fires and use of prescribed fire will return fire to the natural system, with a mosaic of different vegetation successional stages. This will benefit most species of wildlife over the long term, with negative impacts to any species being short-term, and not to a level which could affect populations within the planning area.

Wilderness Study Areas

The non-impairment criteria required for WSAs will protect wildlife habitat from degradation by maintaining it as close as possible to natural conditions. Wildlife will not be subject to disturbance by vehicles or construction-related disturbances.

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

Fish and Wildlife – Greater Sage-Grouse

Alternative A (Current Management)

Surface-disturbing or disruptive activities, including construction-related activities, 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.

Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped.

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 21,000 acres of nesting habitat by providing adequate nesting cover. Maintaining sagebrush densities and nesting cover through grazing management would be done by monitoring and utilization of the Standards for Rangeland Health.

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. Sage-grouse prefer sagebrush densities of 15-25% canopy cover for breeding, nesting, brood rearing and winter cover (Montana Sage Grouse Work Group 2005). Prescribed fire and mechanical treatments could be used to reduce canopy coverage, create openings in dense canopies, remove encroachment of conifers, and stimulate re-sprout of fire-tolerant species, such as silver sagebrush.

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. Maintaining nesting cover through grazing management would be done by monitoring and utilization of Standards for Rangeland Health.

No supplemental feeding, mineral placement or other livestock congregating function would be allowed in identified active 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 could 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 winter habitat (sagebrush canopy of 10-30% and 10-14" height). This could affect 21,000 acres of nesting habitat and 12,000 acres of winter habitat. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area could also result in nest destruction. These disturbances could reduce breeding success, which could cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped.

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. Sage-grouse prefer sagebrush densities of 15-25% canopy cover for breeding, nesting, brood rearing and winter cover (Montana Sage Grouse Work Group 2005). Prescribed fire and mechanical treatments could be used to reduce canopy coverage, create openings in dense canopies, remove encroachment of conifers, and stimulate re-sprout of fire-tolerant species, such as silver sagebrush.

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. Maintaining nesting cover through grazing management would be done by monitoring and utilization of Standards for Rangeland Health.

No supplemental feeding, mineral placement or other livestock congregating function would be allowed to occur in identified active 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 winter habitat (sagebrush canopy of 10-30% and 10-14" height) from December 1 to March 31. This could affect 21,000 acres of nesting habitat and 12,000 acres of winter habitat. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped.

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. Sage-grouse prefer sagebrush densities of 15-25% canopy cover for breeding, nesting, brood rearing and winter cover (Montana Sage Grouse Work Group 2005). Prescribed fire and mechanical treatments could be used to reduce canopy coverage, create openings in dense canopies, remove encroachment of conifers, and stimulate re-sprouting of fire-tolerant species, such as silver sagebrush.

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. Maintaining nesting cover through grazing management would be done by monitoring and utilization of Standards for Rangeland Health.

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

Sage planting would be promoted, where appropriate, within sagebrush habitats. Acres of sagebrush habitat could 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). 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 by allowing recreational shooting.

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 dog towns would be allowed to expand only to the point they would not adversely impact other resources or affect Standards for Rangeland Health. Proposals to reduce prairie dog numbers would be processed through site-specific environmental review, with BLM setting control parameters based on conditions described in the proposal and any mitigation recommended.

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 dog 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 dog towns would be allowed to expand only to the point they would not adversely impact other resources or affect Standards for Rangeland Health. Prairie dog expansion may impact important vegetation or habitat for other wildlife species, including several sensitive species. Prairie dog town expansion rates are variable based on many factors, including type and amount of vegetation present, topography, level of grazing, road access, amount of predation, disease, and precipitation. Based on observations by BLM personnel since 1990 and use of aerial photos going back 25 to 35 years, prairie dog towns within the Missouri River Breaks are normally stable with very slow, if any, growth in size. One small town has died off due to disease, and one was illegally poisoned in 1991 but has recovered. Several towns exhibited explosive growth after 2000 because extended and severe drought created conditions favoring prairie dogs' removal of perennial vegetation. This also resulted in new towns being established along Missouri River bottoms. A human-caused wildland fire in the late 1990s on a river terrace removed tall sagebrush and dense grass understory. Along with drought conditions, this allowed prairie dogs to colonize the entire river bottom outside of a cottonwood grove.

Prairie dog expansion within the Missouri River Breaks will be limited in the future by availability of suitable habitat. Expansion of prairie dogs in current locations will be limited by steep slopes, rivers or creeks, tall vegetation, or controls on private lands. As long as drought conditions favor expansion, it is likely that prairie dogs will continue to expand within available habitat and take advantage of cow trails, bare river shoreline and roads to look for and establish new towns, primarily along the Missouri River.

Specific actions to address adverse impacts from prairie dogs, including proposals to reduce prairie dog numbers, would be addressed through site-specific environmental review, with BLM setting control parameters based on conditions described in the proposal and any mitigation recommended.

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 sage-grouse winter ranges from December 1 to May 15. This would affect 12,000 acres of habitat.

Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area could also result in nest destruction. These disturbances could reduce breeding success, which could cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped.

Black-tailed Prairie Dogs – Not allowing surface-disturbing or disruptive activities 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. Prairie dogs and associated 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. 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 nine 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. This alternative could protect eagle nests by relocating surface disturbances or postponing activities during sensitive nesting periods, and it could protect eagles by repositioning the activity.

Big Game Winter Range – Not allowing surface-disturbing or disruptive activities from December 1 to May 15 during severe winters would prevent additional disturbance of wintering big game during a period of physical stress. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Big game species could experience improved survival due to the reduced stress. This would affect 362,000 acres of mule deer winter range, 225,000 acres of elk winter range and 39,000 acres of 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. This alternative could protect sheep by relocating surface disturbances or postponing activities during sensitive periods, and it could protect sheep by repositioning the activity.

Bighorn Sheep Lambing Areas – Surface-disturbing activities may be controlled or excluded within 200 meters of identified habitat or the activity delayed 60 days. This alternative could protect lambs by relocating surface disturbances or postponing activities during sensitive periods, and it could protect lambs by repositioning the activity.

Alternative B

Greater Sage-Grouse – Mitigation for sage-grouse would include no surface-disturbing or disruptive activities on identified sage-grouse winter habitat from December 1 to March 31 (12,000 acres), no surface-disturbing or disruptive activities in identified nesting areas within 2 miles of sage-grouse leks (21,000 acres), and no surface use within 1/4 mile of a sage-grouse lek (141 acres). Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until

new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience improved survival due to the reduced stress.

Black-tailed Prairie Dogs – Prohibiting surface-disturbing or disruptive activities on prairie dog towns could preserve prairie dogs and associated sensitive status species inhabiting prairie dog towns. Prairie dogs and associated 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. This would involve 500 acres.

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

Bald Eagle – Prohibiting surface-disturbing or disruptive activities 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 alternative could protect eagle nests by relocating surface disturbances or postponing activities during sensitive nesting periods, and it could protect eagles by repositioning the activity. This would affect nine 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-disturbing or disruptive activities on identified winter ranges between December 1 and March 31, would prevent additional disturbance of wintering big game. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Big game species could experience improved survival due to the reduced stress. This would affect 362,000 acres of mule deer winter range, 225,000 acres of elk winter range, and 39,000 acres of antelope winter range.

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

Bighorn Sheep Lambing Areas – Prohibiting surface-disturbing or disruptive activities 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 not as mobile, able to safely negotiate rough terrain or evade predators, and are most vulnerable. This mitigation could improve lamb survival and maintain or improve populations within the available habitat. This would involve 49,000 acres.

Alternative C

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

Black-tailed Prairie Dogs – Prohibiting or minimizing surface-disturbing or disruptive activities on prairie dog towns could preserve prairie dogs and associated sensitive status species inhabiting prairie dog towns. Prairie dogs and associated 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. This would involve 500 acres.

Designated Sensitive Species – Because surface-disturbing activities could be controlled or excluded within identified 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-disturbing or disruptive activities within 1/2 mile of any nest that has been active within the last 7 years could improve nesting success. This alternative could protect eagle nests by relocating surface disturbances or postponing activities during sensitive nesting periods, and it could protect eagles by repositioning the activity. This would affect nine 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-disturbing or disruptive activities on identified bighorn sheep distribution between December 1 and March 31, would prevent additional disturbance of wintering bighorn sheep. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage

restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). This would involve 135,000 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. Prairie dogs and associated 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. This would involve 3,932 acres.

Designated Sensitive Species – Because surface-disturbing activities could be controlled or excluded within identified 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-disturbing or disruptive activities 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 alternative could protect eagle nests by relocating surface disturbances or postponing activities during sensitive nesting periods, and it could protect eagles by repositioning the activity. This would affect nine 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-disturbing or disruptive activities within identified bighorn sheep lambing areas could reduce stress to ewes during parturition and protect lambs when they are not as mobile, able to safely negotiate rough terrain or evade

predators, and are most vulnerable. This could improve lamb survival, reduce stress throughout the year, and maintain or improve populations within the available habitat. This would involve 49,000 acres.

Alternative E

Greater Sage-Grouse – Not allowing surface-disturbing or disruptive activities on identified sage-grouse winter habitat (12,000 acres) and within 2 miles of sage-grouse leks (21,000 acres) would prevent additional disturbance of wintering sage-grouse during periods of physical stress. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience improved survival due to the reduced 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 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-disturbing or disruptive activities on identified winter ranges would prevent additional disturbance of wintering big game. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Big game species could experience improved survival due to the reduced stress. This would involve 362,000 acres of mule deer winter range, 225,000 acres of elk winter range, and 39,000 acres of antelope winter range.

Bighorn Sheep Distribution – Prohibiting surface-disturbing or disruptive activities on identified bighorn sheep distribution areas would prevent additional disturbance of bighorn sheep. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). This would affect 135,000 acres.

Bighorn Sheep Lambing Areas – Prohibiting surface-disturbing or disruptive activities within 1 mile of identified bighorn sheep lambing areas could reduce stress to ewes during parturition and protect lambs when they are not as mobile, able to safely negotiate rough terrain or evade predators, and are most vulnerable. This 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-disturbing or disruptive activities on identified sage-grouse winter habitat from December 1 to March 31 (12,000 acres), no surface-disturbing or disruptive activities in identified nesting areas between March 1 to June 15 within 2 miles of sage-grouse leks (21,000 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. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic

and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). 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. Prairie dogs and associated 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. 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-disturbing or disruptive activities 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 alternative could protect eagle nests by relocating surface disturbances or postponing activities during sensitive nesting periods, and it could protect eagles by repositioning the activity. This would affect nine 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-disturbing or disruptive activities between December 1 and March 31 on identified winter ranges would prevent additional disturbance of wintering big game. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Big game species could experience improved survival due to the reduced stress. This would affect 362,000 acres of mule deer winter range, 225,000 acres of elk winter range, and 39,000 acres of antelope winter range.

Bighorn Sheep Distribution – Prohibiting surface-disturbing or disruptive activities on identified bighorn sheep distribution between December 1 and March 31 would prevent additional disturbance of wintering bighorn sheep. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). This would affect 135,000 acres.

Bighorn Sheep Lambing Areas – Prohibiting surface-disturbing or disruptive activities 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 reduce stress to ewes during parturition and protect lambs when they are not as mobile, able to safely negotiate rough terrain, or evade predators, and are most vulnerable. This could improve lamb survival and maintain or improve populations within the available habitat. This would affect 49,000 acres.

Vegetation

Alternative A (Current Management)

No wildlife impacts would be expected. Current management to promote healthy diverse vegetative

communities will benefit the diverse wildlife within the planning area.

Alternatives B, C, and D

Pallid sturgeon and other fish and wildlife species 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 for pallid sturgeon and other species native to the Missouri River. An increase in riparian vegetation may improve water quality by reducing sediment run-off and by shading and cooling shallow water near shorelines. Additional riparian vegetation may allow more organic detritus to enter the river, providing additional forage base for aquatic species.

Riparian vegetation is one of the most important vegetative communities for a wide variety of wildlife, notably migratory birds, 80% of which utilize riparian habitats during breeding season or migration. Restoration of native vegetation would benefit numerous wildlife species, including designated sensitive species, and migratory and neo-tropical birds by providing additional forage base, nesting and escape cover.

Alternative E

Riparian vegetation is one of the most important vegetative communities for a wide variety of wildlife, notably migratory birds, 80% of which utilize riparian habitats during breeding season or migration. Restoration of native vegetation would benefit numerous wildlife species, including designated sensitive species and migratory and neo-tropical birds by providing additional forage base, nesting and escape cover.

Alternative F (Preferred Alternative)

Pallid sturgeon and other fish and wildlife species 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 for pallid sturgeon and other species native to the Missouri River. An increase in riparian vegetation may improve water quality by reducing sediment run-off and by shading and cooling shallow water near shorelines. Additional riparian vegetation may allow more organic detritus to enter the river, providing additional forage base for aquatic species.

Riparian vegetation is one of the most important vegetative communities for a wide variety of wildlife, notably migratory birds, 80% of which utilize riparian habitats during breeding season or migration. Emphasizing riparian habitat restoration and protection and replacing non-native vegetation with native upland

vegetation would benefit numerous wildlife species, including designated sensitive species, and migratory and neo-tropical birds by providing additional forage base, nesting and escape cover.

Range Improvements

Alternative A (Current Management)

New fence projects would follow standard wildlife specifications for fence installation. Where necessary to reduce impacts to wildlife, existing fences could be adjusted and unnecessary or abandoned fences could 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. 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 movement and reduce potential for wildlife strike and entanglement. Using three versus four-wire fences would lessen barriers to wildlife movement and reduce chances for wildlife entanglement.

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

Alternative F (Preferred Alternative)

New fence projects would follow standard wildlife specifications for fence installation. Where necessary to reduce impacts to wildlife, existing fences would be adjusted and unnecessary or abandoned fences could be removed. This would benefit wildlife where fences are a barrier. Using three versus four-wire fences would lessen barriers to wildlife movement.

New water developments would be considered on a site-specific basis. This could benefit 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 distribution of water sources and wetland habitat.

Right of Way (ROW) Corridors

Alternative A (Current Management)

The ROW corridors would remain as they currently exist (bank-to-bank along seven sections of the Missouri River). Current stipulations require seasonal restrictions for construction to protect all winter habitat for sage-grouse and big game species, and spacing and timing stipulations to protect nesting raptors and designated sensitive species. Threatened and endangered species are protected by the Endangered Species Act. Existing reclamation stipulations require restoration of habitat to native vegetation after construction, and APLIC guidelines are utilized to protect raptors on all overhead power lines. Impacts to wildlife would be short term, except for the presence of overhead power lines that provide roosting structure for raptors. Some ground nesting and roosting birds may avoid these areas, reducing the available habitat for these species. Allowing above-ground structures may cause sage-grouse to avoid these areas, reducing their available habitat. California Fish & Game documented abandonment of all sage-grouse leks within 2.2 kilometers and significant declines out to 5 kilometers from placement of overhead power lines and towers (Frank Hall, pers. comm. 2002).

Alternatives B, C, and D

The current ROW corridors would have defined boundaries. About 18,550 acres of wildlife habitat lie within the corridors. Proposed stipulations require seasonal restrictions for construction to protect all winter habitat for sage-grouse and big game species, spacing and timing stipulations to protect nesting raptors and designated sensitive species, and threatened and endangered species. Existing reclamation stipulations require restoration of habitat to native vegetation after construction, and APLIC guidelines would be utilized to protect raptors on all overhead power lines. This alternative will require all pipelines crossing the Missouri River to be drilled under the riverbed to protect endangered pallid sturgeon and all other aquatic species. Impacts to wildlife would be short-term, except for the presence of overhead power lines which provide roosting structure for raptors. Some ground nesting and roosting birds may avoid these areas, reducing the available habitat for these species. Allowing above-ground structures may cause sage-grouse to avoid these areas, reducing their available habitat. California Fish & Game documented abandonment of all sage-grouse leks within 2.2 kilometers and significant declines out to 5 kilometers from placement of overhead power lines and towers (Frank Hall, pers. comm. 2002).

Alternative E

This alternative would reduce the total acres of wildlife habitat within each ROW corridor. The potential for

disturbance is reduced to the boundaries of these reduced ROW corridors, with about 9,040 acres of wildlife habitat. Proposed stipulations require seasonal restrictions for construction to protect all winter habitat for sage-grouse and big game species, spacing and timing stipulations to protect nesting raptors and designated sensitive species, and threatened and endangered species. Existing reclamation stipulations require restoration of habitat to native vegetation after construction, and APLIC guidelines would be utilized to protect raptors on all overhead power lines. This alternative would require all pipelines crossing the Missouri River to be drilled under the riverbed to protect endangered pallid sturgeon and all other aquatic species. Impacts to wildlife would be short-term, except for the presence of overhead power lines which provide roosting structure for raptors. Some ground nesting and roosting birds may avoid these areas, reducing the available habitat for these species. Allowing above-ground structures may cause sage-grouse to avoid these areas, reducing their available habitat. California Fish & Game documented abandonment of all sage-grouse leks within 2.2 kilometers and significant declines out to 5 kilometers from placement of overhead power lines and towers (Frank Hall, pers. comm. 2002).

Alternative F (Preferred Alternative)

The current ROW corridors would have defined boundaries, with one ROW corridor south of the river increasing in width to encompass a new county road along with an existing road. About 17,790 acres of wildlife habitat are within the corridors. Proposed stipulations would require seasonal restrictions for construction to protect all winter habitat for sage-grouse and big game species, spacing and timing stipulations to protect nesting raptors, designated sensitive species, and threatened and endangered species. Existing reclamation stipulations require restoration of habitat to native vegetation after construction, and APLIC guidelines would be utilized to protect raptors on all overhead power lines. This alternative will require all pipelines crossing the Missouri River to be drilled under the riverbed to protect endangered pallid sturgeon and all other aquatic species. Impacts to wildlife would be short-term, except for presence of overhead power lines which provide roosting structure for raptors. Some ground nesting and roosting birds may avoid these areas, reducing the available habitat for these species. Allowing above-ground structures may cause sage-grouse to avoid these areas, reducing their available habitat. California Fish & Game documented abandonment of all sage-grouse leks within 2.2 kilometers and significant declines out to 5 kilometers from placement of overhead power lines and towers (Frank Hall, pers. comm. 2002).

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 environmental review 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)

As nesting birds, including waterfowl, may abandon their nest when disturbed, resulting in loss of some nests and reduced nesting success, 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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999).

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 some human/big game conflicts that could arise when animals may be stressed from winter conditions, but allowing collection in early spring may cause additional stress on big game, if the level of activity increases. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999).

Alternative D

As nesting birds, including waterfowl, may abandon their nest when disturbed, resulting in loss of some nests and reduced nesting success, 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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). 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, improve nesting success, and provide secure loafing areas for all wildlife along the river, season long.

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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to

stresses that would be considered minor at other times of the year (Canfield et al. 1999).

Alternative F (Preferred Alternative)

As nesting birds, including waterfowl, may abandon their nest when disturbed, resulting in loss of some nests and reduced nesting success, 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 a negative impact from human intrusion during sensitive winter time periods is documented. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999).

Upper Missouri River Special Recreation Management Area (SRMA)

Alternative A (Current Management)

Existing recreation use levels and campsites displace wildlife during floating and hunting seasons. Campgrounds and recreational use of riparian areas and vegetation will have the greatest impacts. Riparian vegetation is one of the most important vegetative communities for a wide variety of wildlife, notably migratory birds, 80% of which utilize riparian habitats during breeding season or migration.

Alternative B

By providing additional Level 1, 2, and 3 sites, additional wildlife may become displaced from valuable wildlife habitat. Riparian vegetation is one of the most important vegetative communities for a wide variety of wildlife, notably migratory birds, 80% of which utilize riparian habitats during breeding season or migration. This alternative 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. 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 alternative 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. Riparian vegetation is one of the most important vegetative communities for a wide variety of wildlife, notably migratory birds, 80% of which utilize riparian habitats during breeding season or migration. 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. Current impacts to wildlife and important habitat would continue.

Alternative F (Preferred Alternative)

Additional Level 1, 2, and 3 sites could be constructed. This alternative 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. Riparian vegetation is one of the most important vegetative communities for a wide variety of wildlife, notably migratory birds, 80% of which utilize riparian habitats during breeding season or migration. This could impact many species, including raptors, migratory and neo-tropical birds, bats, reptiles, amphibians, and mule and whitetail deer. Current impacts to wildlife and important habitat would continue.

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 few areas would be disrupted by extended use.

Alternative B

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

Alternative C

Level 1 sites would be constructed only at the beginning of public access roads into the Monument, causing disturbance and harassment of wildlife within the vicinity. The most important wildlife habitat would not be impacted, but important habitat adjacent to the recreational facilities could be impacted.

Alternative D

Level 1 sites would be prohibited and Level 2 facilities would only be located on existing main artery roads, causing disturbance and harassment of wildlife within the vicinity. Impacts to wildlife would be located where there is less identified habitat. This would benefit wildlife, since concentrations of campers would not be located within some of the upland areas of the Monument, but important habitat adjacent to the recreational facilities could be impacted.

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. This would cause disturbance and harassment of wildlife within the vicinity of any sites constructed outside of the Monument. Impacts would be reduced for big game species within the Monument, but would be the same or greater for species dependent on that habitat near the edge or outside of the Monument.

Alternative F (Preferred Alternative)

Level 1 sites would only be constructed at the beginning of public access roads into the Monument, causing disturbance and harassment of wildlife within the vicinity. There would be less big game winter habitat impacted within the Monument since impacts to wildlife would occur outside and to the edge of the Monument. 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 winter habitat from December 1 to May 15. This would affect identified nesting habitat and 955 acres of winter habitat (Table 4.4) by prohibiting construction-related activities within 1/4 mile of a lek, and restricting or excluding activity in winter habitat from December 1 to May 15.

Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers

from the lek at which hens were trapped. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience improved survival due to the reduced 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 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. Prairie dogs and associated 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

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

<i>Wildlife Habitat</i>	<i>West HiLine Leases (Acres)</i>	<i>Non-West HiLine Leases (Acres)</i>	<i>Total (Acres)</i>
Greater Sage-Grouse			
Lek (1/4-mile restriction)	0	31	31
Nesting Area (2-mile restriction)	1,291	4,083	5,374
Winter Habitat	955	819	1,774
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
Mule Deer Winter Range	10,328	32,477	42,805
Elk Winter Range	6,779	23,323	30,102
Antelope Winter Range	3,804	7,039	10,843
Bighorn Sheep Distribution	3,080	11,164	14,244
Bighorn Sheep Lambing Areas (1-mile restriction)	1,059 3,192	5,504 10,358	6,563 13,550

area. 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 for nesting raptors 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-disturbing or disruptive activities.

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-disturbing or disruptive activities.

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 10,328 acres of mule deer winter range, 6,779 acres of elk winter range, and 3,804 acres of antelope winter range (Table 4.4). This would prevent additional disturbance of wintering big game during a period of physical stress. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Big game species could experience improved survival due to the reduced 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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). This alternative may not provide adequate protection of bighorn sheep during this period. 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. Prohibiting surface-disturbing or disruptive activities 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 not as mobile, able to safely negotiate rough terrain, or evade predators, and are most vulnerable. This mitigation may not improve lamb survival and maintain or improve populations within the available habitat. 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-disturbing or disruptive activities on identified sage-grouse winter habitat from December 1 to March 31, no surface-disturbing or disruptive activities 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, 5,374 acres of nesting habitat, and 1,774 acres of winter habitat (Table 4.4). Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area.

In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience improved survival due to the reduced stress and protection of additional habitat.

Black-tailed Prairie Dogs – A condition of approval would be attached to each APD which would prohibit surface-disturbing or disruptive activities on prairie dog towns. Prairie dogs and associated 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. This would affect 72 acres of prairie dog towns (Table 4.4).

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 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-disturbing or disruptive activities 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. This determination would be made at the time of the environmental review. There are no known bald eagle nests within 1 mile of the oil and gas leases. This alternative could protect eagle nests by relocating surface disturbances or postponing activities during sensitive nesting periods, and it could protect eagles by repositioning the activity. 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-disturbing or disruptive activities 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 42,805 acres of mule deer winter range, 30,102 acres of elk winter range, and 10,843 acres of antelope 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-disturbing or disruptive activities 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 not as mobile, able to safely negotiate rough terrain or evade predators, and are most vulnerable. 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

Greater 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-disturbing or disruptive activities on prairie dog towns. This could preserve prairie dogs and the associated sensitive status species inhabiting prairie dog towns. Prairie dogs and associated 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. 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 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-disturbing or disruptive activities 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-disturbing or disruptive activities on identified bighorn sheep distribution areas between December 1 and March 31 during winter months. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). 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

Greater 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. Prairie dogs and associated 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. 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 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 due to fewer disturbances while nesting. 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-disturbing or disruptive activities within 1/2 mile of any nest that has been active within the last 7 years and within riparian nesting habitat. This alternative could protect eagle nests by relocating surface disturbances or postponing activities during sensitive nesting periods, and it could protect eagles by repositioning the activity. 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-disturbing or disruptive activities within 1 mile of identified bighorn sheep lambing areas. This would involve 13,550 acres of bighorn sheep lambing areas and could reduce stress to ewes during parturition and protect lambs when they are not as mobile, able to safely negotiate rough terrain, or evade predators, and are most vulnerable. This could improve lamb survival, reduce stress throughout the year, and maintain or improve populations within the available habitat.

Alternative E

No surface disturbance would be allowed on the 12 West HiLine oil and gas leases. This includes the entire leasehold (12,782 acres). APDs on these leases would

not be processed. This decision would have no effect on wildlife

For the non-West HiLine leases, there would be no impact to wildlife since surface-disturbing or disruptive activities would also be prohibited.

Alternative E_{NL}

This sub-alternative considers the environmental effects of not leasing the 12 West HiLine leases. The effects to wildlife are the same as those from Alternative E, which would not allow surface-disturbing and disruptive activities on any of the 12 West HiLine oil and gas leases regardless if the land is inside or outside the Monument. This includes the entire leasehold (12,782 acres). The decision to not lease would have no effect on wildlife.

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-disturbing or disruptive activities would be prohibited from March 1 to August 1, within 1/2 mile of active ferruginous hawk nest sites. This may improve nesting success to most raptors due to fewer disturbances while nesting. 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-disturbing or disruptive activities 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 could protect eagle nests by relocating surface disturbances or postponing activities during sensitive nesting periods, and it could protect eagles by repositioning the activity. 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 Operations – 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 miles) and any increase in traffic. Impacts would include additional disturbances from traffic, and fragmentation and reduced acreage of wildlife habitat.

Production Operations, 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 sage-grouse, elk, bighorn sheep and other big game during sensitive times of the year (parturition, winter range use) by causing additional disturbances. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped. Sage-grouse can experience reduced survival due to the increased stress. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999).

Noise can deter wildlife from using an area (BLM 2003d). Animals will react to noises, but it is especially troublesome for songbirds. Noise-related problems for birds include interference with the males' ability to attract mates and defend territory, interference with ability to recognize warning calls, and calls from juveniles (BLM 2003d). Standard operating procedures and BMPs would be followed for general production facilities and equipment.

The total amount of habitat destroyed, altered, fragmented or impacted by the production-related activity and other traffic would increase for every well, road, pipeline, pit fence, and compressor.

Alternative B

Seismic Operations – Impacts would be the same as Alternative A.

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 Operations, 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 sage-grouse, 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.

Noise can deter wildlife from using an area (BLM 2003d). Animals will react to noises, but it is especially troublesome for songbirds. Noise-related problems for birds include interference with the males' ability to attract mates and defend territory, interference with ability to recognize warning calls, and calls from juveniles (BLM 2003d). 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.

The total amount of habitat destroyed, altered, fragmented or impacted by the production-related activity and other traffic would increase for every well, road, pipeline, pit fence, and compressor.

Alternative C

Seismic Operations – 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 (12.4 miles).

Production Operations, Facilities and Equipment – Pipelines would only be permitted within existing disturbances or the location that is least intrusive. It is reasonably foreseeable 9.3 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 sage-grouse, 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.

Noise can deter wildlife from using an area (BLM 2003d). Animals will react to noises, but it is especially troublesome for songbirds. Noise-related problems for birds include interference with the males' ability to attract mates and defend territory, interference with ability to recognize warning calls, and calls from juveniles (BLM 2003d). 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.

The total amount of habitat destroyed, altered, fragmented or impacted by the production-related activity and other traffic would increase for every well, road, pipeline, pit fence, and compressor.

Alternative D

Seismic Operations – 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 disrupt wildlife and wildlife activity 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 Operations, 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 sage-grouse, 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.

Noise can deter wildlife from using an area (BLM 2003d). Animals will react to noises, but it is especially troublesome for songbirds. Noise-related problems for birds include interference with the males' ability to attract mates and defend territory, interference with ability to recognize warning calls, and calls from juveniles (BLM 2003d). 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.

The total amount of habitat destroyed, altered, fragmented or impacted by the production-related activity and other traffic would increase for every well, road, pipeline, pit fence, and compressor.

Alternatives E and E_{NL}

Seismic Operations – 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 Operations, 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.

Noise can deter wildlife from using an area (BLM 2003d). Animals will react to noises, but it is especially troublesome for songbirds. Noise-related problems for birds include interference with the males' ability to attract mates and defend territory, interference with ability to recognize warning calls, and calls from juveniles (BLM 2003d). 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. Alternatives E and E_{NL} alter the smallest amount of wildlife habitat, provide the smallest amount of disturbance year long for all species of wildlife, and provide the greatest year-round protection for all wildlife.

The total amount of habitat destroyed, altered, fragmented or impacted by the production-related activity and other traffic would increase for every well, road, pipeline, pit fence, and compressor.

Alternative F (Preferred Alternative)

Seismic Operations – 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 by limiting access for exploration and using less disturbing methods.

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 Operations, 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.

Noise can deter wildlife from using an area (BLM 2003d). Animals will react to noises, but it is especially troublesome for songbirds. Noise-related problems for birds include interference with the males' ability to attract mates and defend territory, interference with ability to recognize warning calls, and calls from juveniles (BLM 2003d). 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.

The total amount of habitat destroyed, altered, fragmented or impacted by the production-related activity and other traffic would increase for every well, road, pipeline, pit fence, and compressor.

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 miles of access roads to support natural gas operations and surface disturbance on 17 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

Public travel would be prohibited in specific areas. There would be the potential for an additional 17.4 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 C

The impacts would be the same as Alternative B, except there would be an estimated 12.4 miles of new resource roads associated with natural gas operations.

Alternative D

The impacts would be similar to Alternative B, 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 from non-industry traffic, especially species that are sensitive to increased human contact. Wildlife would continue to be impacted from industry traffic and potentially unauthorized use of routes by non-industry.

Alternative F (Preferred Alternative)

The impacts would be similar to Alternative B, 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 (68 miles). 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). 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.

Mackie et al. (1998a) observed that deer survive primarily by supplementing energy reserves accumulated prior to winter with energy intake from sub maintenance winter diets. This requires behavior that emphasizes energy conservation. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). The loss of habitat in the protected breaks habitat would have a greater impact than loss in more open areas. Ryder and

Irwin (1987) reported that larger shrubs, steep slopes, and irregular topography were important determinants of winter habitat use for pronghorn. Mackie et al. (1998a) stated that “most mule deer populations in prairie badland environments are closely associated with rugged badlands or non-timbered breaks. He also stated, “By use of shelter associated with badlands topography, mule deer reduced conductive heat loss by 47% at feeding sites and by 61% in bedding sites.”

Disturbance corridors and activities associated with them may lead to wildlife avoiding habitats close to the corridors. Habitat in the vicinity to the corridor is effectively lost. Fragmentation of the landscape may occur if avoidance of disturbance corridors prevents wildlife from fully using land on either side of a corridor (Jalkotzy et al. 1997). Of all the disturbance corridors humans create, roads probably have the greatest impact on wildlife populations. Wildlife will frequently avoid habitats in the vicinity of roads and similar transportation corridors because of repeated disturbances along the corridor (Jalkotzy et al. 1997). In Colorado, fecal pellet counts indicated that deer avoided areas near paved and dirt roads on winter range, particularly those areas within 200 meters of roads. (Jalkotzy et al. 1997). They also stated that “. . . deer avoided dirt roads that were used only by 4-wheel drive vehicles, trail bikes, and hikers.” Yarmoloy et al. (1988) were able to demonstrate how little disturbance was required to modify deer behavior. Harassing of three mule deer does for 9 minutes/day for 15 days in October caused the deer to begin feeding at night and using cover more frequently. They also suggested a secondary effect through reduced reproduction. Their recommendations/guidelines for reducing impacts included moving facilities, trails, and roads away from ungulate wintering areas, avoiding open ridges, and using topography to buffer noise and disturbance. O’Gara and Yoakum (1992) recommended that with new oil and gas wells and associated roads, “Avoidance areas should include south facing slopes and wind-blown ridges on pronghorn winter ranges.” A study in North Dakota stated, “Although the population (mule deer) had over seven years to habituate to oil and gas activities, avoidance of roads and facilities was determined to be long term and chronic.”

While literature documented impacts up to 1/4 mile in forested habitat, impacts could be expected to be much greater in open habitat. The Oil and Gas Development on the Southern Ute Indian Reservation EIS (BLM 2002e) suggested that human presence associated with exploration and development of oil and gas wells disturbed wildlife at distances up to 1/2 mile, and that operation and maintenance activities caused disturbance within 1/4 mile of wells and roads. A big game study on elk (Lyon 1979) found that “elk avoid areas within 1/4 - 1/2 mile of roads. The area avoided increases where the density of tree cover is low.” Rost and Bailey (1979) stated that road avoidance was greater by deer, when

compared to elk. Big game will temporarily abandon areas near disturbance-causing activities and are acclimated in this area to flee from any vehicles. This unnecessary movement uses energy resources and adds stress to the animals.

Roads with moderate rates of motorized traffic may function as population sinks for many species of reptiles, resulting in reduced population sizes and increased isolation of populations (USFS 2001). There would be long-term impacts to reptiles with roads into the breaks habitat. These impacts are impossible to quantify at this time due to inadequate inventories.

Road System Criteria

The miles of roads that 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. However, 71% of the road system may require landowner permission for access to BLM 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. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience improved survival due to the reduced stress.

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.

Table 4.5 BLM Road Analysis for Wildlife Habitat Alternative A (Current Management)		
Wildlife Habitat	Roads Open	
	Yearlong	Yearlong and Seasonally
Mule Deer Winter Range		
Miles	492	559
Density (mile/mile ²)	0.87	0.99
Acres within 1/4 mile	137,181	153,991
Elk Winter Range		
Miles	318	384
Density (mile/mile ²)	0.91	1.09
Acres within 1/4 mile	88,760	105,238
Antelope Winter Range		
Miles	77	86
Density (mile/mile ²)	1.28	1.43
Acres within 1/4 mile	19,819	21,758
Bighorn Sheep Distribution		
Miles	124	154
Density (mile/mile ²)	0.59	0.73
Acres within 1/4 mile	36,857	43,697
Bighorn Sheep Lambing Areas		
Miles	38	47
Density (mile/mile ²)	0.49	0.61
Acres within 1/4 mile	12,265	14,066
Sage-Grouse Winter Habitat		
Miles	28	34
Density (mile/mile ²)	1.48	1.79
Acres within 1/4 mile	6,336	7,050
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile ²)	0.23	0.23
Acres within 1/4 mile	74	74

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

Designated Sensitive Species – There would be no public travel restrictions. Raptors and other bird species not acclimated to vehicular disturbances could abandon nests. 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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). 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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999).

Bighorn Sheep Lambing Areas – There would be no public travel restrictions. Bighorn lambing success could be compromised by traffic during the lambing period. This could cause stress to ewes during parturition and lambs when they are not as mobile, able to safely negotiate rough terrain or evade predators, and are most vulnerable.

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 destruction.

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 disturbance, and wildlife habitat.

Road System Criteria

The miles of roads that 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. However, 72% of the road system may require landowner permission for access to BLM roads.

Greater 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. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped. Sage-grouse winter survival could be compromised by traffic during stressful winter conditions on sage-grouse 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be

considered minor at other times of the year (Canfield et al. 1999).

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.

<i>Wildlife Habitat</i>	<i>Roads Open</i>	
	<i>Yearlong</i>	<i>Yearlong and Seasonally</i>
Mule Deer Winter Range		
Miles	451	546
Density (mile/mile ²)	0.80	0.97
Acres within 1/4 mile	125,752	150,119
Elk Winter Range		
Miles	316	381
Density (mile/mile ²)	0.90	1.09
Acres within 1/4 mile	88,001	104,550
Antelope Winter Range		
Miles	67	69
Density (mile/mile ²)	1.11	1.14
Acres within 1/4 mile	20,159	21,729
Bighorn Sheep Distribution		
Miles	87	151
Density (mile/mile ²)	0.41	0.72
Acres within 1/4 mile	26,679	43,091
Bighorn Sheep Lambing Areas		
Miles	8	45
Density (mile/mile ²)	0.10	0.58
Acres within 1/4 mile	3,983	13,822
Sage-Grouse Winter Habitat		
Miles	32	36
Density (mile/mile ²)	1.69	1.90
Acres within 1/4 mile	6,634	7,050
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile ²)	0.23	0.23
Acres within 1/4 mile	103	103

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

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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999).

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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999).

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 not as mobile, able to safely negotiate rough terrain or evade predators, and are most vulnerable. 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 MFWP 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 disturbance, 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 that 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. However, 74% of the road system may require landowner permission for access to BLM 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 winter habitat. This would protect greater sage-grouse during sensitive breeding periods and during sensitive winter periods when sage-grouse are susceptible to human disturbance and would prevent additional disturbance of wintering sage-grouse during periods of physical stress. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all

nests monitored were located farther than 5 kilometers from the lek at which hens were trapped.

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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience improved survival due to the reduced 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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). 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 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. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Bighorn sheep could experience improved survival due to reduced stress.

Table 4.7 BLM Road Analysis for Wildlife Habitat Alternative C		
<i>Wildlife Habitat</i>	<i>Roads Open</i>	
	<i>Yearlong</i>	<i>Yearlong and Seasonally</i>
Mule Deer Winter Range		
Miles	413	508
Density (mile/mile ²)	0.73	0.90
Acres within 1/4 mile	115,602	141,378
Elk Winter Range		
Miles	286	352
Density (mile/mile ²)	0.81	1.00
Acres within 1/4 mile	80,287	98,652
Antelope Winter Range		
Miles	75	81
Density (mile/mile ²)	1.24	1.34
Acres within 1/4 mile	19,189	20,558
Bighorn Sheep Distribution		
Miles	77	133
Density (mile/mile ²)	0.37	0.63
Acres within 1/4 mile	23,790	38,772
Bighorn Sheep Lambing Areas		
Miles	7	34
Density (mile/mile ²)	0.09	0.44
Acres within 1/4 mile	3,544	11,242
Sage-Grouse Winter Habitat		
Miles	28	33
Density (mile/mile ²)	1.48	1.74
Acres within 1/4 mile	6,032	6,465
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile ²)	0.23	0.23
Acres within 1/4 mile	103	103

*Miles of BLM roads per square mile of habitat on BLM land.

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

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 MFWP 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 disturbance, by closing nearly 45% of the existing roads.

Road System Criteria

The miles of roads that 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. However, 67% of the road system may require landowner permission for access to BLM 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 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 disturbance, and would prevent additional disturbance of wintering sage-grouse during periods of physical stress. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can

reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan, 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped.

Table 4.8 BLM Road Analysis for Wildlife Habitat Alternative D		
Wildlife Habitat	Roads Open	
	Yearlong	Yearlong and Seasonally
Mule Deer Winter Range		
Miles	272	312
Density (mile/mile ²)	0.48	0.55
Acres within 1/4 mile	82,051	92,976
Elk Winter Range		
Miles	198	222
Density (mile/mile ²)	0.56	0.63
Acres within 1/4 mile	59,860	66,260
Antelope Winter Range		
Miles	46	55
Density (mile/mile ²)	0.76	0.91
Acres within 1/4 mile	12,797	15,267
Bighorn Sheep Distribution		
Miles	63	88
Density (mile/mile ²)	0.30	0.42
Acres within 1/4 mile	19,340	26,248
Bighorn Sheep Lambing Areas		
Miles	8	23
Density (mile/mile ²)	0.10	0.30
Acres within 1/4 mile	3,198	7,086
Sage-Grouse Winter Habitat		
Miles	20	24
Density (mile/mile ²)	1.06	1.27
Acres within 1/4 mile	4,494	5,444
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile ²)	0.23	0.23
Acres within 1/4 mile	74	74

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

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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience improved survival due to the reduced 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 by reducing potential disturbances.

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

Big Game Winter Range – 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 not as mobile, able to safely negotiate rough terrain or evade predators, and are most vulnerable. 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 MFWP 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 by reducing potential disturbances.

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 disturbance by closing nearly 82% of existing roads.

Road System Criteria

The miles of roads that 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. However, 36% of the road system may require landowner permission for access to BLM 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 winter habitat. This would protect greater sage-grouse during sensitive breeding periods and sensitive winter periods when sage-grouse are susceptible to human disturbance. This would prevent additional disturbance of wintering sage-grouse during periods of physical stress. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped. 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. Even with warming temperatures and reduced snow depths, early

spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience improved survival due to the reduced stress.

Table 4.9 BLM Road Analysis for Wildlife Habitat Alternative E		
Wildlife Habitat	Roads Open	
	Yearlong	Yearlong and Seasonally
Mule Deer Winter Range		
Miles	86	90
Density (mile/mile ²)	0.15	0.16
Acres within 1/4 mile	24,710	25,646
Elk Winter Range		
Miles	56	60
Density (mile/mile ²)	0.16	0.17
Acres within 1/4 mile	16,182	17,114
Antelope Winter Range		
Miles	8	8
Density (mile/mile ²)	0.13	0.13
Acres within 1/4 mile	2,206	2,206
Bighorn Sheep Distribution		
Miles	31	35
Density (mile/mile ²)	0.15	0.17
Acres within 1/4 mile	9,199	10,131
Bighorn Sheep Lambing Areas		
Miles	5	7
Density (mile/mile ²)	0.06	0.09
Acres within 1/4 mile	1,742	2,179
Sage-Grouse Winter Habitat		
Miles	5	5
Density (mile/mile ²)	0.26	0.26
Acres within 1/4 mile	1,194	1,194
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile ²)	0.23	0.23
Acres within 1/4 mile	74	74

*Miles of BLM roads 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 – There could be seasonal closures on resource, local, and collector roads within 1/4 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 by reducing potential disturbances.

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 by reducing potential disturbances.

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 disturbance, 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 that 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. However, 69% of the road system may require landowner permission for access to BLM 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 winter habitat would prevent disturbance of breeding birds, some nesting areas, and wintering sage-grouse during a periods of physical stress. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. In Montana most nesting occurs within 2 miles of the lek (Wallestad and Pyrah 1974, Braun et al. 1977), but a recent study in central Montana (Moynahan 2004) showed approximately 40% of all nests monitored were located farther than 5 kilometers from the lek at which hens were trapped. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience improved survival due to the reduced stress.

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 by reducing potential disturbances 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. This alternative could protect eagle nests by relocating surface disturbances or postponing activities during sensitive nesting periods, and it could protect eagles by repositioning the activity. Bald eagles are susceptible to disturbance during winter roosting in severe weather and temperatures. This alternative would not protect bald eagles from disturbance during winter in roosting areas.

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.

Table 4.10 BLM Road Analysis for Wildlife Habitat Alternative F (Preferred Alternative)		
<i>Wildlife Habitat</i>	<i>Roads Open</i>	
	<i>Yearlong</i>	<i>Yearlong and Seasonally</i>
Mule Deer Winter Range		
Miles	267	378
Density (mile/mile ²)	0.47	0.67
Acres within 1/4 mile	78,597	112,178
Elk Winter Range		
Miles	183	272
Density (mile/mile ²)	0.52	0.77
Acres within 1/4 mile	53,513	80,348
Antelope Winter Range		
Miles	45	60
Density (mile/mile ²)	0.75	0.99
Acres within 1/4 mile	12,669	16,661
Bighorn Sheep Distribution		
Miles	77	106
Density (mile/mile ²)	0.37	0.50
Acres within 1/4 mile	23,014	31,323
Bighorn Sheep Lambing Areas		
Miles	19	28
Density (mile/mile ²)	0.25	0.36
Acres within 1/4 mile	6,476	9,074
Sage-Grouse Winter Habitat		
Miles	23	27
Density (mile/mile ²)	1.21	1.43
Acres within 1/4 mile	5,150	6,028
Prairie Dog Towns		
Miles	<1	<1
Density (mile/mile ²)	0.23	0.23
Acres within 1/4 mile	74	74

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

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 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 when lambs are not as mobile, able to safely negotiate rough terrain, or evade predators, and are most vulnerable.

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 MFWP 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)

Due to infrequent seasonal use of all airstrips taking place through summer and fall, current impacts to wildlife from use of airstrips are not significant, and no impacts have been documented by BLM and MFWP (Rosgaard, Sullivan and Stivers, MFWP biologists, pers. comm. 2005).

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

Due to infrequent seasonal use of all airstrips taking place through summer and fall, current impacts to wildlife from use of airstrips are not significant, and no impacts have been documented by BLM and MFWP (Rosgaard, Sullivan and Stivers, MFWP biologists, pers. comm. 2005).

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

Due to infrequent seasonal use of all airstrips taking place through summer and fall, current impacts to wildlife from use of airstrips are not significant, and no impacts have been documented by BLM and MFWP (Rosgaard, Sullivan and Stivers, MFWP biologists, pers. comm. 2005).

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

Alternative D

Due to infrequent seasonal use of all airstrips taking place through summer and fall, current impacts to wildlife from use of airstrips are not significant, and no impacts have been documented by BLM and MFWP (Rosgaard, Sullivan and Stivers, MFWP biologists, pers. comm. 2005).

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

Due to infrequent seasonal use of all airstrips taking place through summer and fall, current impacts to wildlife from use of airstrips are not significant, and no impacts have been documented by BLM and MFWP (Rosgaard, Sullivan and Stivers, MFWP biologists, pers. comm. 2005).

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.

Table 4.11 Backcountry Airstrips within Wildlife Habitat Alternatives A (Current Management) and B				
<i>Airstrip</i>	<i>Elk and Mule Deer Winter Range</i>	<i>Bighorn Sheep Distribution</i>	<i>Bighorn Sheep Lambing</i>	<i>Sage-Grouse Winter Habitat</i>
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				
<i>Airstrip</i>	<i>Elk and Mule Deer Winter Range</i>	<i>Bighorn Sheep Distribution</i>	<i>Bighorn Sheep Lambing</i>	<i>Sage-Grouse Winter Habitat</i>
Black Butte North	Yes			
Bullwhacker	Yes	Yes		
Cow Creek				Yes
Ervin Ridge	Yes	Yes	Yes	
Knox Ridge	Yes			
Left Coulee	Yes	Yes		
Woodhawk		Yes		

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

Alternative F (Preferred Alternative)

Due to infrequent seasonal use of all airstrips taking place through summer and fall, current impacts to wildlife from use of airstrips are not significant, and no impacts have been documented by BLM and MFWP (Rosgaard, Sullivan and Stivers, MFWP biologists, pers. comm. 2005).

Six airstrips would be open and clusters would be avoided. Any current or future disturbances from use of these airstrips would continue. Future documentation of impacts to wildlife populations in the area of any airstrip may result in seasonal or permanent closure to protect the wildlife values within the Monument. 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 154,000 acres of mule deer winter range, 105,000 acres of elk winter range, and 7,000 acres of sage-grouse winter habitat are within 1/4 mile of an open BLM road. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. 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. Even with warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience reduced survival due to the increased stress.

Big game and sage-grouse would continue to be impacted by existing and potential natural gas development and infrastructure in winter habitat. 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. Even with warming

temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). About 16,800 acres of mule deer winter range, 16,500 acres of elk winter range, and 700 acres of 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. Disturbance during breeding and nesting could cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area could also result in nest destruction.

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

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

This alternative would improve fisheries habitat by improving water quality and riparian vegetation. Other fisheries impacts would be negligible based on the scale of the Missouri River and the erosive nature of the uplands in the Missouri Breaks. Cumulative impacts would not affect fish, amphibian, or aquatic invertebrate populations or food base.

Alternative B

Management under this alternative may protect habitat for many designated sensitive species and in some important big game habitats, but would protect the smallest amount of habitat for all species.

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. Disturbance during breeding and nesting can cause sage-grouse to abandon breeding activity or attempt to relocate historic and preferred breeding and nesting areas. Activity within this area can also result in nest destruction. These disturbances can reduce breeding success, which can cumulatively impact the population within the area. 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. Even with

warming temperatures and reduced snow depths, early spring reveals many ungulates at the absolute lowest physical condition of the year. Until new, green forage restores lost weight and energy, these animals may succumb to stresses that would be considered minor at other times of the year (Canfield et al. 1999). Sage-grouse could experience reduced survival due to the increased stress. About 150,000 acres of mule deer winter range, 105,000 acres of elk winter range and 7,000 acres of 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 winter habitat. About 24,300 acres of mule deer winter range, 16,500 acres of elk winter range, and 400 acres of 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 wildlife and alter wildlife habitat important to many species.

This alternative would improve fisheries habitat by improving water quality and riparian vegetation. Other fisheries impacts would be negligible based on the scale of the Missouri River and the erosive nature of the uplands in the Missouri Breaks. Cumulative impacts would not affect fish, amphibian, or aquatic invertebrate populations or food base.

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 by limiting additional disturbances from most activities, reducing noise, reducing traffic and total miles of open roads, which could reduce total disturbances to wildlife and provide larger blocks of secure habitat.

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. About 141,000 acres of mule deer winter range, 99,000 acres of elk winter range, and 6,500 acres of 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 winter habitat. About 25,800 acres of mule deer winter range, 18,400 acres of elk winter range, and 400 acres of 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 by limiting the presence and noise of these activities.

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 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 by limiting the presence and noise of these activities.

This alternative would improve fisheries habitat by improving water quality and riparian vegetation. Other fisheries impacts would be negligible based on the scale of the Missouri River and the erosive nature of the uplands in the Missouri Breaks. Cumulative impacts would not affect fish, amphibian, or aquatic invertebrate populations or food base.

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 by limiting additional disturbances from most activities, reducing noise, reducing traffic and total miles of open roads, which could reduce total disturbances to wildlife and provide larger blocks of secure habitat.

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. About 93,000 acres of mule deer winter range, 66,000 acres of elk winter range, and 5,400 acres of 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 winter habitat. About 10,900 acres of mule deer winter range, 6,400 acres of elk winter range, and 950 acres of 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 wildlife and alter 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.

This alternative would improve fisheries habitat by improving water quality and riparian vegetation. Other fisheries impacts would be negligible based on the scale of the Missouri River and the erosive nature of the uplands in the Missouri Breaks. Cumulative impacts would not affect fish, amphibian, or aquatic invertebrate populations or food base.

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 by limiting additional disturbances from most activities, reducing noise, reducing traffic and total miles of open roads, which could reduce total disturbances to wildlife and provide larger blocks of secure habitat. The greatest amount of habitat would be protected for all species under this alternative.

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. About 25,600 acres of mule deer winter range, 17,100 acres of elk winter range and 1,200 acres of 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 winter 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 by limiting the presence and noise of these activities.

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 by limiting the presence and noise of these activities.

This alternative would improve fisheries habitat by improving water quality and riparian vegetation. Other fisheries impacts would be negligible based on the scale of the Missouri River and the erosive nature of the uplands in the Missouri Breaks. Cumulative impacts would not affect fish, amphibian, or aquatic invertebrate populations or food base.

Alternative F (Preferred Alternative)

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

disturbances from most activities, reducing noise, reducing traffic and total miles of open roads, which could reduce total disturbances to wildlife and provide larger blocks of secure habitat.

Big game and sage-grouse would be impacted by the use of existing roads in important wildlife habitat. About 112,000 acres of mule deer winter range, 80,000 acres of elk winter range, and 6,000 acres of 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 winter habitat. About 33,600 acres of mule deer winter range, 26,800 acres of elk winter range, and 880 acres of 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 by limiting the presence and noise of these activities.

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 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 by limiting the presence and noise of these activities.

This alternative would improve fisheries habitat by improving water quality and riparian vegetation. Other fisheries impacts would be negligible based on the scale of the Missouri River and the erosive nature of the uplands in the Missouri Breaks. Cumulative impacts would not affect fish, amphibian, or aquatic invertebrate populations or food base.

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

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 and 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 and vehicles 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 K), 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.

Surface-disturbing activities should be avoided on soils with severe erosion hazard, badlands, slopes susceptible to mass failure, and other areas subject to active erosion (e.g., rock outcrop, dune lands, or blowouts) to reduce excessive erosion and/or reclamation problems or failure.

Vegetation

Managing for healthy vegetation communities would help to achieve or maintain Proper Functioning Condition (PFC). Achieving or maintaining PFC on upland sites promotes adequate amounts of vegetative cover to stabilize soils and provide organic material and nutrient cycling. Achieving or making significant progress towards 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 J).

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 J). 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 to reduce excessive erosion and/or reclamation problems or failure. Careful planning and design of the disturbing activity could limit potential impacts. Reclamation using the appropriate BMPs (Appendix K) 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.

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 in those areas. Prescribed fire and/or mechanical treatments could result in short-term localized (1 to 3 years) soil compaction and erosion until vegetation is re-established.

Alternative F (Preferred Alternative)

Prescribed fire and/or mechanical treatments could result in short-term localized (1 to 3 years) soil erosion and compaction until vegetation is re-established.

Fish and Wildlife – Black-tailed Prairie Dog Towns

Alternatives A (Current Management) and E

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, D, and F (Preferred Alternative)

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 J). This would ensure that soils remain stable and accelerated erosion, in the form of rills and/or gullies, is minimal.

Forest Products

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

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

Alternative E

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

Alternative F (Preferred Alternative)

Harvesting forest products and vegetation manipulation treatments would result in localized bare soil exposure, soil compaction and rutting. This could result in increased short-term (1 to 2 years) surface runoff,

erosion, sedimentation and decreased slope stability. Impacts would be addressed in site-specific environmental reviews and silviculture plans. Best Management Practices (Appendix K) would be applied to meet site-specific needs and mitigate impacts.

Right-of-Way Corridors, Avoidance Areas and Exclusion Areas

Alternative A (Current Management)

Avoidance areas for lineal rights-of-way (ROWS) include areas containing sedimentary Break soils. Avoidance of these areas would reduce excessive erosion and/or reclamation problems or failure. The ROW corridors are bank-to-bank along seven sections of the Missouri River.

Alternative B, C, and D

Avoidance areas for ROWs would include areas containing severely erosive soils. Avoidance of these areas would reduce excessive erosion and/or reclamation problems or failure. Approximately 6,480 acres would be on severely erosive soils within the eight utility corridors.

Alternative E

Avoidance areas for ROWS would include areas considered unsuitable due to erosion and slope where impacts could not be mitigated or effectively controlled. Avoidance of these areas would reduce excessive erosion and/or reclamation problems or failure. Approximately 3,237 acres would be on areas considered unsuitable due to erosion and slope within the eight utility corridors.

Alternative F (Preferred Alternative)

Avoidance areas for ROWS would include areas considered unsuitable due to erosion and slope where impacts could not be mitigated or effectively controlled. Avoidance of these areas would reduce excessive erosion and/or reclamation problems or failure. Approximately 6,491 acres would be on areas considered unsuitable due to erosion and slope within the eight utility corridors.

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 Management

Prescribed and wildland fires cause short-term localized runoff, soil erosion, 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, except in areas where there is high burn severity, 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 fire ignitions can be controlled to times of year when there is less likely damage to soils from excessive heating. Prescribed fires reduce fuel loading, minimizing the risk of catastrophic wildland fires; therefore, short-term impacts associated with prescribed fire generate long-term benefits by reducing the risk of highly damaging catastrophic wildland fires. Impacts from prescribed fires would be addressed in site-specific environmental reviews 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 to 3 years) localized runoff, soil erosion, and sedimentation. 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 severity and 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 to 3 years) runoff, soil erosion, and sedimentation associated with prescribed fires would only occur in the Wilderness Study Area Fire Management Unit (FMU). Soil impacts could occur on approximately 35,000 acres. 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 to 3 years) localized runoff, soil erosion, and sedimentation. 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 to 3 years) localized runoff, soil erosion, and sedimentation, 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. Soil impacts could occur on approximately 40,000 acres.

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 could occur on approximately 40,000 acres.

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 (Eligible Stream Segments)

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

There would be no impact, as there would be no changes 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.

Camping Facilities – Increased soil compaction and erosion and decreased soil productivity could occur within areas of concentrated use and as additional camping facilities are developed.

Motorized Watercraft – Wakes from motorized watercraft could potentially impact shore stability, resulting in increased sediment in the Missouri River; however, this has not been documented in the Monument. 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 – The impacts would be the same as Alternative A.

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 standards and indicators (Appendix Q) would minimize impacts to 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) and reduce impacts in dispersed locations. 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 – The impacts would be the same as Alternative A.

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 standards and indicators (Appendix Q) 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 – 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 – The impacts would be the same as Alternative A.

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.

Camping Facilities – Soil and vegetation disturbances, compaction and erosion could decrease because no additional campsites would be developed.

Motorized Watercraft – There would be no potential 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. Soil impacts would be minimized by management adjustments when standards and indicators (Appendix Q) are reached or exceeded. Desired Future Condition (DFC) indicates that soil erosion and compaction from human use would be minimized 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 from Fort Benton downstream to 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) and reduce impacts in dispersed locations. 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 potentially impact shore stability, resulting in increased sediment in the Missouri River; however, this has not been documented in the Monument. 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 localized impacts to soils and vegetation. Soil compaction could increase, resulting in decreased site production and soil productivity at those sites.

Alternative B

Providing additional 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 these disturbances to the developed areas (assuming use is shifted to those

areas) and reduce impacts in dispersed locations. 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 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 these disturbances to the developed areas (assuming use is shifted to those areas) and reduce impacts in dispersed locations. There is the potential for short-term (less than a year) localized soil compaction and erosion during the construction of Level 1 sites. Soil disturbances from vehicular travel could be less because of the shorter distances to Level 1 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 runoff, accelerated soil erosion 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 erosion 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 successful 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 4th Edition, 2006 Gold Book).

Surface-disturbing activities should be avoided on soils with severe erosion hazard, steep slopes, badlands, slopes susceptible to mass failure, and other areas subject to active erosion (e.g., rock outcrop, dune lands, or blowouts) to reduce excessive erosion and/or reclamation problems or failure.

Interim reclamation of areas not needed for production and operations should begin shortly after construction or establishing oil or gas production on the site. 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 non-productive and continue to be at risk of erosion until abandonment and reclamation.

Vehicular and 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 (1% of the Monument).

Soils would be stabilized by vegetative cover and accelerated erosion potential would be eliminated within 1 to 3 years following successful 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 (3% of the Monument).

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. Approximately 1,683 of the 10,328 acres of oil and gas leases are on slopes 30% and greater (less than 1% of the Monument).

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. Approximately 5,352 of the 32,477 acres of oil and gas leases are on slopes 30% and greater (1% of the Monument).

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 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. Approximately 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 (1% of the Monument).

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. Approximately 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 (3% of the Monument).

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. Approximately 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 (1% of the Monument).

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. Approximately 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 (3% of the Monument).

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 – There would be no impact to soils because surface-disturbing activities would not be

allowed. This includes the entire leasehold (12,782 acres). APDs on these leases would not be processed. Soils would not be subject to bare exposure, compaction, runoff and subsequent erosion that results from natural gas development.

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%. Approximately 11,616 of the 32,477 acres of oil and gas leases are on slopes 20% and greater (3% of the Monument).

Alternative E_{NL}

This sub-alternative considers the environmental effects of not leasing the 12 West HiLine leases. There would be no impact to soils. Surface-disturbing activities would not be allowed. Soils would not be subject to bare exposure, compaction, runoff and subsequent erosion that results from natural gas development. The effects to cultural resources are the same as those from Alternative E.

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. Approximately 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 (1% of the Monument).

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. There have been past projects on slopes 20% and greater that have been successfully reclaimed and erosion controlled. Stringent stipulations and mitigation measures were enforced. Sediment containment systems, erosion control products, mulching, and drill seeding were some of the devices and practices used to capture sediment, control erosion and re-establish vegetation. Examples within the Monument include the Klabzuba pipeline and the 34-25-19 well. The Northern Border and Express pipelines are examples outside the Monument where reclamation and erosion control were successful. These

two projects were conducted on similar landforms with similar soil types as found in the Monument.

Soils would be stabilized by vegetative cover and accelerated erosion potential would be eliminated within 1 to 3 years following successful 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. Approximately 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 (3% of the Monument).

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 Operations – 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 approximately 70 acres in addition to the 136 existing acres for the construction of the well sites, access roads and pipelines. Interim reclamation of areas not needed for production and operations should begin shortly after construction or establishing oil or gas production on the site. Rehabilitating parts of the well pads and pipelines during production would reduce soil disturbance to approximately 24 acres. There would be a long-term commitment of the soil resource on approximately 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 successful reclamation.

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

Based on the RFD, there is the potential for approximately 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 Operations, 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 re-vegetation of the disturbed areas. Soil conditions and site productivity could easily be returned with proper design, construction methods and reclamation practices.

Alternative B

Seismic Operations – 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 approximately 103 acres in addition to the 136 existing acres 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 approximately 28 acres. A long-term commitment of the soil resource on approximately 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 runoff, water, 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 efforts would be problematic or fail.

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

Based on the RFD, there is the potential for approximately 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 Operations, Facilities and Equipment – The impacts would be the same as Alternative A.

Alternative C

Seismic Operations – 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 minimized because surface-disturbing activities would be mitigated. Soils mitigation would include avoiding soils with severe erosion hazard, badlands, slopes susceptible to mass failure, and other areas subject to active erosion (e.g., rock outcrop, dune lands, or blowouts) with equipment/vehicles; and, avoiding operations during moist or 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 approximately 55 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 approximately 21 acres. A long-term commitment of the soil resource on approximately 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.

Based on the RFD, there is the potential for approximately 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 Operations, Facilities and Equipment – Requiring new pipelines to stay within existing disturbances 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 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 Operations – Soil disturbance would be confined to designated roads with no exceptions. Operations would not be allowed during moist or 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 approximately 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 approximately 16 acres. A long-term commitment of the soil resource on approximately 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 compaction and rutting from vehicle and equipment movement during moist or wet conditions.

Production Operations, 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 Operations – Soil disturbance would be confined to designated roads with no exceptions. Operations would not be allowed during moist or 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 approximately 136 acres from the well sites, access roads and pipelines. Rehabilitating parts of the well pads and pipelines during production would reduce soil disturbance to approximately 14 acres. There would be a long-term commitment of the soil resource on approximately 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 compaction and rutting from vehicle and equipment movement during moist or wet conditions.

Production Operations, 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 Operations – 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 minimized because surface-disturbing activities would be mitigated. Soils mitigation would include avoiding soils with severe erosion hazard, badlands, slopes susceptible to mass failure, and other areas subject to active erosion (e.g., rock outcrop, dune lands, or blowouts) with equipment or vehicles; avoiding operations during moist or wet soil conditions; and requiring helicopter and ground support in sensitive areas.

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 approximately 71 acres in addition to the 136 existing acres for the construction of the well sites, access roads and pipelines. Interim reclamation of areas not needed for production and operations should begin shortly after construction or establishing oil or gas production on the site. Rehabilitating parts of the well pads and pipelines during production would reduce soil disturbance to approximately 24 acres. A long-term commitment of the soil resource on approximately 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 successful 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 runoff, water, 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 efforts would be problematic or fail.

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

Based on the RFD, there is the potential for approximately 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 Operations, 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 compaction, rutting, surface runoff and subsequent erosion. The severity of disturbance would depend upon soil conditions (moist or wet vs. dry or frozen), frequency, vehicle weight (lbs. /sq. inch), tire width or 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 Monument.

Each road segment would be assigned a maintenance level with specific minimum maintenance standards for control of runoff, erosion and sedimentation. Drainage structures would be installed or maintained as needed. Grading would be performed only where necessary to correct drainage problems and erosion or when ruts in the roadbed need address for travel comfort. This would result in an increase in vegetation, overtime, within the roads; reducing concentrated flow and stabilizing soils.

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

Roads with poor design and improper maintenance would be the most susceptible to erosion due to runoff, compacted surfaces and lack of vegetative cover.

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 K).

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 compaction, rutting, and erosion 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 previously restricted by the West HiLine RMP, Judith-Valley-Phillips RMP, or completed watershed or activity plans. This could allow for an increase in the number of vehicles traveling over and disturbing soils and

vegetation; resulting in increased soil compaction, rutting, surface runoff and subsequent 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.

Approximately 1 mile would be closed for erosion concerns. This includes two roads that are typically impassable and subject to active erosion and washouts.

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 moist or wet soil conditions.

Motorized or mechanized vehicles would not be allowed to pull off designated routes for camping; therefore, there would be no 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 or segments of roads to protect soils where erosion and slope stability are concerns.

Less than 1/10 of a mile of BLM roads would be closed for erosion concerns (subject to active erosion and washouts). Soils on closed roads would become productive once vegetation is returned.

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 moist or wet soil conditions.

Allowing motorized or mechanized vehicles to pull off designated routes up to 300 feet for camping could result in the creation of new wheel tracks. This would depend on factors such as soil conditions (moist or wet vs. dry or frozen), frequency, and vehicle weight (lbs./sq. inch). In

areas of concentrated use, soils could become compacted and rutted.

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 or segments of roads to protect soils where erosion and slope stability are concerns.

Approximately 3 miles of BLM roads would be closed for erosion concerns. These roads are typically impassable and subject to active erosion and washouts. 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 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 moist or wet soil conditions.

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

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 or segments of roads to protect soils where erosion and slope stability are concerns.

Approximately 6 miles of BLM roads would be closed for erosion concerns. These roads are typically impassable and subject to active erosion and washouts. 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 the creation of new wheel tracks. This would depend on factors such as soil conditions (moist or wet vs. dry or frozen), frequency, and vehicle weight (lbs./sq. inch). In areas of concentrated use, soils could become compacted and rutted.

Alternative E

This alternative would result in 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 or segments of roads to protect soils where erosion and slope stability are concerns.

Approximately 6 miles of BLM roads would be closed for erosion concerns. These roads are typically impassable and subject to active erosion and washouts. 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; therefore, there would be no 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 or segments of roads to

protect soils where erosion and slope stability are concerns.

Approximately 13 miles of BLM roads would be closed for erosion concerns and another 7 miles would be closed seasonally. These roads are typically impassable and subject to active erosion and washouts. 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 moist or wet soil conditions.

Allowing motorized or mechanized vehicles to park within 50 feet of roads could result in the creation of new wheel tracks. This would depend on factors such as soil conditions (moist or wet vs. dry or frozen), frequency, and vehicle weight (lbs./sq. inch). In areas of concentrated use, soils could become compacted and rutted. There would be no soil impacts in the WSAs because motorized or mechanized vehicles would not be allowed to pull off designated routes for parking.

Aviation

Alternatives A (Current Management) and B

The airstrips are vegetated. The vegetative cover meets or exceeds what is expected for the sites. This vegetative cover provides protection to the soils from wind and water forces. If vegetation is removed during maintenance, exposing bare soil, soils would be susceptible to wind erosion. These impacts could occur on less than 20 acres.

Alternative C

The airstrips are vegetated. The vegetative cover meets or exceeds what is expected for the sites. This vegetative cover provides protection to the soils from wind and water forces. If vegetation is removed during maintenance, exposing bare soil, soils would be susceptible to wind erosion. These impacts could occur on less than 14 acres.

Alternative D

The airstrips are vegetated. The vegetative cover meets or exceeds what is expected for the sites. This vegetative cover provides protection to the soils from wind and water forces. If vegetation is removed during maintenance, exposing bare soil, soils would be

susceptible to wind erosion. These impacts could occur on less than 12 acres.

Alternative E

The airstrips are vegetated. The vegetative cover meets or exceeds what is expected for the sites. This vegetative cover provides protection to the soils from wind and water forces.

Alternative F (Preferred Alternative)

The airstrips are vegetated. The vegetative cover meets or exceeds what is expected for the sites. This vegetative cover provides protection to the soils from wind and water forces. If vegetation is removed during maintenance, exposing bare soil, soils would be susceptible to wind erosion. These impacts could occur on less than 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. Soil improvements would continue, resulting in an overall improvement in soil productivity and watershed health within the planning area.

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, provide for prescribed fire, 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 106 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. Soil improvements would continue, resulting in an overall improvement in soil productivity and watershed health within the planning area.

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, provide for prescribed fire, 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 142 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. Soil improvements would continue, resulting in an overall improvement in soil productivity and watershed health within the planning area.

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, provide for prescribed fire, 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. Soil improvements would continue, resulting in an overall improvement in soil productivity and watershed health within the planning area.

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, provide for prescribed fire, 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 to 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.

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, provide for prescribed fire, 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. Soil improvements would continue, resulting in an overall improvement in soil productivity and watershed health within the planning area.

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, provide for prescribed fire, 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 108 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 result in 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 on the scale of the Monument.

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 maintain 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 of 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 Management

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 and change composition and structure of vegetation.

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 result in disturbance beyond those the fire would create. This impact can be mitigated by post-fire reclamation actions.

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

Fish and Wildlife – Greater-Sage-Grouse

Alternative A (Current Management)

The impacts of current management actions on vegetation have been previously analyzed in watershed or activity plan environmental assessments.

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)

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 substantial impact and would be limited to

simplification of vegetation community and a 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.

Resource reserve allotments would create a favorable impact on vegetation by providing opportunities to relieve grazing 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. Benefits include management flexibility in grazing treatments and providing grazing rest and/or opportunities to change seasons of grazing.

Reclamation of non-functional water developments with native vegetation will improve the vegetative community. 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 damaging wildland fires. Wildland fires could be hotter and more complete, which could change the vegetation community to earlier succession plant species. This impact would generally be in dispersed or disconnected pockets of trees which occur in the eastern half of the Monument. Overall, not allowing wood cutting in itself would not have a substantial impact on vegetation.

Alternative F (Preferred Alternative)

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 the harvest of 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.

Fire Management

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 circumstances 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. The impacts of prescribed fires would be analyzed in site-specific environmental reviews 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 Monument and South Monument FMUs. Burning could be pursued in WSAs for the purpose of public safety and resources. 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 the natural role of fire. In the Wild and Scenic FMU, the impacts would be 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 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. The impacts of prescribed fires would be analyzed in site-specific environmental reviews and burn plans for each project.

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. If large group use occurs frequently during the year it could lead to changes in vegetation composition. This impact can be mitigated by limiting frequency and duration of use in specific areas.

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 successionaly. 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.

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).

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

Alternative A (Current Management)

Seismic Operations – Techniques that involve surface use, such as off-road travel and/or blasting, 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 trail 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 of disturbance with conventional operating procedures in the Monument.

Production Operations, 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 Operations – Techniques that involve surface use, such as off-road travel and/or blasting, 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 Operations, 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 Operations – 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 Operations, 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

Surface disturbance would not be allowed on any of the 12 West HiLine oil and gas leases regardless if the land is inside or outside the Monument. This includes the entire leasehold (12,782 acres). APDs on these leases would not be processed. The decision to not allow APDs to be processed would have no effect on vegetation.

Seismic Operations – 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 Operations, 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_{NL}

This sub-alternative considers the environmental effects of not leasing the 12 West HiLine leases. Impacts to vegetation are the same as Alternative E.

Alternative F (Preferred Alternative)

Seismic Operations – Techniques that involve surface use, such as off-road travel and/or blasting, 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 Operations, 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)

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

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, approximately 592 miles of open and limited use roads translates into about 1,000 acres of vegetation impacted by roads. The roads that would be 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, approximately 573 miles of BLM roads would remain open and there would be no change of impact on vegetation for approximately 970 acres occupied by these roads. For those roads that are closed, vegetation would have the opportunity to recover on approximately 50 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.

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, approximately 534 miles of BLM roads would remain open and there would be no change of impact on vegetation for approximately 910 acres of vegetation occupied by these roads. For those roads that are closed, vegetation would have the opportunity to recover on approximately 120 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 not be substantial.

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, approximately 336 miles of BLM roads would remain open and there would be no change on approximately 570 acres of vegetation occupied by these roads. For those roads that are closed, vegetation would have the opportunity to recover on approximately 460 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, approximately 107 miles of BLM roads would remain open and there would be no change on approximately 180 acres of vegetation occupied by these roads. For those roads that are closed, vegetation would have the opportunity to recover on approximately 850 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, approximately 404 miles of BLM roads would remain open and there would be no change on approximately 690 acres of vegetation occupied by these roads. For the roads that would be closed, approximately 340 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 vehicles to park within 50 feet of a road would create the potential for impacting vegetation if this driving develops new tracks. This could create noticeable impacts in conspicuous areas along regularly used roads; however, the total impacted area would be very few acres.

Aviation

Alternative A (Current Management)

The impact on vegetation by aircraft is inconsequential. All the airstrips have existed for at least 20 years and some more than 50 years and are grass covered. The volume of use on these airstrips is low and aircraft that use them are lightweight and do not have traction to the tires that would cause ruts. Impacts to vegetation occur in how the airstrips are maintained. Since little maintenance is occurring there is rarely impact to vegetation and when it does occur it is in an area that has been previously disturbed and is likely being done by hand rather than by earthmoving equipment.

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 to 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 to 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 to 2 acres; therefore, impacts would occur on less than 12 acres.

Alternative E

All of the airstrips would be closed. The airstrips would be allowed to revegetate naturally and there would be no additional impacts to vegetation.

Alternative F (Preferred Alternative)

The impact on vegetation by aircraft would be inconsequential. All the airstrips have existed for at least 20 years and some more than 50 years and are grass covered. The volume of use on these airstrips is low and aircraft that use them are lightweight and do not have traction to the tires that would cause ruts. Impacts to vegetation occur in how the airstrips are maintained.

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 to 2 acres; therefore, impacts would occur on less than 12 acres. Impacts to vegetation could be a change in composition from shrubs to grass on the localized area.

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 been addressed in previous plans and would be common to all alternatives. Livestock grazing is controlled through terms and conditions incorporated in grazing permits and 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. Livestock grazing in terms of use or allocation is not addressed in the range of alternatives in this RMP as discussed under Alternatives Considered but Not Analyzed in Detail in Chapter 2. Impacts to riparian areas from livestock grazing such as decreased density of preferred woody vegetation (cottonwood, willow, green ash, box elder, chokecherry, etc.), bank trampling, and herbaceous forage consumption would continue. These impacts would be partially mitigated by implementing management actions and livestock grazing guidelines for meeting Standards for Rangeland Health. As these actions are implemented, riparian conditions are expected to improve. Riparian vegetation in all allotments would benefit from implementation of management actions and livestock grazing guidelines intended to help riparian areas achieve PFC and/or the desired plant community. Grazing systems could be changed to achieve other resource objectives or values such as forage or fish and wildlife habitat. Implementing and enforcing standards

and guidelines would enhance riparian and aquatic habitat, reduce erosion and sedimentation, slow runoff, increase sedimentation on banks and floodplains, and increase bank storage in riparian areas.

A limited and critical time window exists for effective control and management of Russian olive within the UMNWSR. Native riparian vegetation, including preferred woody species such as cottonwood, willow, green ash and red-osier dogwood, will benefit from the eradication and control of invasive, woody species. According to Kudray et al. (2004), Russian olive can displace native shrubs and later successional trees, eventually forming monotypic stands that fundamentally alter natural ecosystem composition, structure, function, and habitat value.

The release of high water events when stakeholder coordination and hydrologic conditions allow will promote riparian vegetation. These events will help to establish preferred woody species by creating suitable site conditions for regeneration of cottonwood and willow species. Newly established stands that are safe from subsequent disturbance will be able to follow natural succession and develop understories of preferred riparian shrub species.

Regardless of which alternative is selected, the BLM will comply with all applicable laws and regulations concerning riparian resources. Riparian vegetation will be protected with the use of mitigation measures being applied to all proposed projects near riparian-wetland areas.

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 capability 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 BLM, at its discretion, would restore or establish native riparian vegetation in areas considered to have the capability to support this vegetation. Therefore, 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. Damage to riparian vegetation, particularly understory shrubs, would occur from the clearing of brush for campsite locations.

Alternatives B and C

Opportunities for Boaters – The number of people floating the river or camping in riparian areas would not be limited. Under Alternative C, 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 of cottonwoods (saplings and poles), willows, green ash, and box elder from riparian areas, especially along the Missouri River. 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 to riparian vegetation 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. Additional Level 3 sites could be added to all sections of the river although 60% of campsites would be Level 4 in the wild and scenic segments. The additional campsites would degrade riparian vegetation by trampling, firewood gathering, and harvesting woody vegetation. At popular campsites, soil compaction would preclude the area from returning to a natural shrub-dominated site.

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)

Opportunities for Boaters – The number of people floating the river or camping in riparian areas would not be limited. 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 of cottonwoods (saplings and poles), willows, green ash, and box elder from riparian areas, especially along the Missouri River. 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.

Impacts to Vegetation – Riparian from Natural Gas Exploration and Development

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

Surface-disturbing activities may be controlled or excluded within 200 meters (656 feet) of the proposed site (43 CFR 3101.1-2). Existing laws and regulations that currently protect riparian resources would continue to be enforced. Given the character of the landscape and rough topography in the Monument, once a proposed site is excluded from a stream or riparian-wetland area, it is out of the well-developed floodplain and onto upland terraces. The difference in impacts to riparian resources from no surface disturbance within 500 feet, 656 feet, 1000 feet, and 1/4 mile of streams and riparian-wetland areas would be negligible.

Alternative E

No surface disturbance would be allowed on all 12 West HiLine oil and gas leases. No impacts to riparian areas would occur on the West HiLine leases. Conditions of approval would be applied to the non-West HiLine leases. The difference in impacts to riparian resources on the non-West HiLine leases compared to the other alternatives would be negligible.

Alternative E_{NL}

This sub-alternative considers the environmental effects of not leasing the 12 West HiLine leases. No impacts to riparian areas would occur on the West HiLine leases.

Alternative F (Preferred Alternative)

Surface-disturbing activities may be controlled or excluded within 200 meters (656 feet) of the proposed site (43 CFR 3101.1-2). Existing laws and regulations that currently protect riparian resources would continue to be enforced. Given the character of the landscape and rough topography in the Monument, once a proposed site is excluded from a stream or riparian-wetland area, it is out of the well-developed floodplain and onto upland terraces. The difference in impacts to riparian resources from no surface disturbance within 500 feet, 656 feet, 1000 feet, and 1/4 mile of streams and riparian-wetland areas 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. This alternative would leave less than two miles of BLM roads open in riparian areas, as shown in Table 4.14.

Table 4.14
Miles of BLM Open or Closed Roads in Riparian Areas by Alternative

	<i>Closed Roads (miles)</i>	<i>Open Roads (Yearlong and Seasonally) (miles)</i>
Alternative A (Current Management)	0	1.37
Alternative B	.07	1.30
Alternative C	.15	1.22
Alternative D	.31	1.06
Alternative E	.34	1.03
Alternative F (Preferred Alternative)	.19	1.18

Alternatives B, C, D, and E

The closure of roads in riparian areas would allow the regeneration of riparian vegetation in the disturbed areas. The number of miles of closed and open (yearlong or seasonally) roads in riparian areas under each alternative are displayed in Table 4.14.

Alternative F (Preferred Alternative)

A total of .19 miles of roads would be closed in riparian areas. The miles of closed and open roads in riparian areas under Alternative F are displayed in Table 4.14.

Summary of Cumulative Impacts to Vegetation – Riparian

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

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 (Auble and Scott 1998, Hansen 1989, and 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. Impacts to riparian vegetation from nonnative, invasive woody species such as Russian olive are currently small. However, a limited and critical time window exists for effective control and management of Russian olive within the UMNWSR.

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.

Alternative 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 (Auble and Scott 1998, Hansen 1989, and 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. Impacts to riparian vegetation from nonnative, invasive woody species such as Russian olive are currently small. However, a limited and critical time window exists for effective control and management of Russian olive within the UMNWSR.

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. Herbicide applications would occur on such a small scale at any given time that any unintended drift that may occur would have no measurable impact on air quality. 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 cultural importance. Invasive plant species may threaten culturally important flora through competition for resources, increase fire danger near historical buildings and structures, and expose, move and degrade artifacts by increasing soil erosion.

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 sustaining systems with few empty niches for invasive plant species to exploit.

Wildlife are known to be vectors of invasive plant spread. Most spread occurs through seed that becomes caught in hair or feathers from infested sites and then carried to un-infested sites. It is not uncommon to find areas used for shelter and bedding to be infested by invasive plant species.

Vegetation – Noxious and Invasive Plants

By continuing to use the Guidelines for Integrated Weed Management, 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 across administrative boundaries.

Recreation

The movement of people, their pets and equipment will always present the potential for introduction and spread of these plants. Because the Monument will continue to draw visitors from around the country and the world, it can be expected that invasive species will be introduced and spread by various recreational activities. One of the most common means of invasive plant introduction is the movement of vehicles. Most highway-type vehicles are not as likely to pick up seed and move it from place to place, but they can pick up seed from infested rights-of-way along highways. Hunting vehicles like four-wheel drive pickups, sport utility vehicles, and off-road ATVs are more likely to have picked up invasive plant seed in skid plates, tires, and in mud caked under wheel wells. Given this, the most common introduction sites will most likely be along roads and in parking areas.

Watercraft such as motorboats, canoes, rafts and floatplanes brought in from contaminated waters can also introduce invasive species. This risk includes aquatic nuisance species such as the Zebra mussel and Quagga mussel that have shown to be very problematic in waterways in other parts of the country.

Due to the fact that all established recreational sites have invasive species present, camping and hiking opportunities also risk moving invasive species into uninfested areas off the river. The movement of invasive plants would also occur from site to site along the river as contaminated material is moved from camp site to camp site.

The risk of moving invasive species through recreational activities can be mitigated through education, awareness, and prevention efforts, but it cannot be completely avoided.

Fire Management

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. Healthy riparian vegetation acts as a buffer from the introduction of invasive plant species. As existing habitat continues to age without replenishment (mainly cottonwood and willow regeneration), invasion of noxious plants is inevitable as the river will continually supply invasive plant seed to these areas from upstream infestations.

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 may become a significant component of the disturbed area if left unchecked. In most 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 can 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. By catching any new invasions early, actions can be taken to eradicate these infestations.

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 could become a

significant component of the disturbed area if left unchecked. In many instances, however, there is no invasive 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 most 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 can deter colonization and establishment of new invasions.

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. If these areas already have established invasive or noxious plant populations, it may take several decades to reach the desired goal. Established weeds have the ability to recover from short-term treatments through perennial root structures and the seed bank. Some species such as field bindweed have shown that seed can survive up to 50 years in the soil.

The use of non-native vegetation would pose some risk to the environment as most non-native species have a genetic potential to become invasive at some point after establishment.

When used in restoration, any given non-native species could have the potential to dominate other planted and present vegetation dependent on environmental conditions and genetic characteristics of the introduced species.

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 a realistic goal in some areas and treatments used to meet this goal may actually introduce invasive and noxious weeds into an area. If these areas already have established invasive or noxious plant populations, it may take several decades to reach the desired goal. Established weeds have the ability to recover from short-term treatments through perennial root structures and the seed bank. Some species such as field bindweed have shown that seed can survive up to 50 years in the soil.

Alternative F (Preferred Alternative)

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 can 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. By catching any new invasions early, actions can be taken to eradicate these infestations.

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 could become a significant component of the disturbed area if left unchecked. In many instances, however, there is no invasive 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 most 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.

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 developed 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 developed for the Monument. Herbicide applications, biological control activity, and other types of treatment require certain weather and environmental conditions to be effectively implemented. By limiting administrative travel to downstream travel 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 developed for the Monument. Herbicide applications, biological control activity, and other types of treatment 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, 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 F (Preferred Alternative)

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 – This alternative 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, if uniform procedures for administrative travel do not preclude upstream travel during available windows of opportunity to control invasive and noxious plants.

Impacts to Vegetation – Noxious and Invasive Plants from Natural Gas Exploration and Development

Alternative A (Current Management)

Seismic Operations – 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 Operations – 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 and D

Seismic Operations – 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 E

The impacts would be similar to Alternatives C and D, except there would be no direct impact to the area covered by the 12 West HiLine leases since surface-disturbing activities would be prohibited.

Alternative E_{NL}

The impacts would be similar to Alternatives C and D, except if the area covered by the 12 West HiLine leases was not leased there would be no direct impact from oil and gas activity.

Alternative F (Preferred Alternative)

Seismic Operations – 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.

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 – 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 – 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 deter the establishment of invasive and noxious plants.

Alternative F (Preferred Alternative)

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.

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, provided adequate funding is allotted for this purpose for the long term.

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, due to the restrictions imposed on the administrative access required to reach invasive plant infestations.

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 overall impacts would be similar to Alternatives A and B, except for natural gas operations. Limiting surface-disturbing seismic activities and using low impact drilling would reduce the potential introduction and spread of invasive and noxious plants.

Visual Resources

Impacts to Visual Resources from Health of the Land and Fire

Visual Resource Management (VRM)

Alternative A (Current Management)

VRM Class I – For the 61,700 acres in 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 visual quality objectives of preserving the existing visual character of the Monument landscape. About 64% of the UMNWSR, 11% of the Cow Creek ACEC, and 16% of the WSAs would lie within VRM Class I (Table 4.15). For the WSAs, under the non-impairment standard most activities must be temporary uses that create no surface disturbance, nor involve permanent placement of structures. Overall, 16% of the Monument would fall within VRM Class I.

VRM Class II, III, and IV – For any of the 313,300 acres of Monument 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 visual quality objectives. About 25% of the UMNWSR would be within VRM Class II and 11% within VRM Class IV. About 19% of the Cow Creek ACEC would lie within VRM Class II and 70% within VRM Class IV.

About 19% of the WSAs would fall within 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. Overall, 84% of the Monument would fall within VRM Classes II, III and IV.

Alternative B

About 76% of the UMNWSR would lie within VRM Class I, 18% within VRM Class II; and 6% within VRM Class IV. In the Cow Creek ACEC about 32% of the area would lie within VRM Class I, 19% within VRM Class II, and 49% within VRM Class IV (Table 4.15).

This alternative would designate 100% of the WSAs as VRM Class I.

The possibility exists for producing greater man-made visual contrasts to the Monument's natural landscape on Class III and 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 62,600 acre increase for VRM Class I acreage under Alternative B. The 111,480 acres includes the WSAs, portions of 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 visual quality objectives.

VRM Class II – There would be a decrease of 14,480 acres in the VRM Class II category.

VRM Class III and IV – For any of the 159,200 acres under VRM Classes III and IV, 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

About 63% of the UMNWSR would lie within VRM Class I and 30% within VRM Class II; 7% would lie within VRM Classes III and IV. In the Cow Creek ACEC about 11% of the area would fall within VRM Class I and 68% within VRM Class II; 21% would fall within VRM Class IV (Table 4.15).

About 16% of the WSAs would fall 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.

VRM Class I – The VRM Class I acreage would total 16%. For the 62,000 acres in VRM Class I, the visual contrast that may be created from proposed projects would be mitigated, at a minimum, 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 III – The VRM Class II acreage would increase to 58% of the Monument. The increased acreage (24% greater than Alternative A) would improve protection of the visual quality of the Monument.

VRM Class III would decrease to 4%. For the 234,500 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 visual quality objectives.

VRM Class IV – The VRM Class IV land in the uplands would be designated at higher levels of protection for visual landscape values. A total of 78,500 acres of the Monument would fall under VRM Class IV.

Alternative D

About 76% of the UMNWSR would lie within VRM Class I and 24% within VRM Class II. In the Cow Creek ACEC about 32% of the area would lie within VRM Class I and 68% within VRM Class II (Table 4.15).

This alternative would designate a VRM Class I rating for 100% of the WSAs.

VRM Class I – The BLM land under VRM Class I would increase to 111,480 acres. Surface-disturbing activities would be prohibited on some land in VRM Class I.

VRM Class II – For the 263,520 acres in VRM Class II, the visual contrast from proposed projects would be

mitigated 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

About 76% of the UMNWSR would lie within VRM Class I and 24% within VRM Class II; In the Cow Creek ACEC about 32% of the area would lie within VRM Class I and 68% within VRM Class II (Table 4.15).

This alternative would designate a VRM Class I rating for 100% of the WSAs.

VRM Class I – The VRM Class I acreage would remain the same as under Alternatives B and D. Surface-disturbing activities may be prohibited on some of the 74,650 acres of VRM Class I land in WSAs. An

additional 36,830 acres outside of WSAs may 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 if the activities would not meet the visual quality objectives.

Alternative F (Preferred Alternative)

There would be an increase (66% or 92,540 acres) in the most restrictive visual management categories (VRM Classes 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% under Alternative A.

All four VRM classes would be represented on BLM land but VRM Class III and Class IV designations would be at significantly lower acreages.

Table 4.15 Visual Resource Management Classes for Special Designation Areas (Percent of Total Acres)						
	<i>Alternative A (Current Management)</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>Alternative D</i>	<i>Alternative E</i>	<i>Alternative F (Preferred Alternative)</i>
UMNWSR						
<i>VRM Class I</i>	64%	76%	63%	76%	76%	76%
<i>VRM Class II</i>	25%	18%	30%	24%	24%	22%
<i>VRM Class III</i>	0%	0%	1%	0%	0%	1%
<i>VRM Class IV</i>	11%	6%	6%	0%	0%	1%
Total	100%	100%	100%	100%	100%	100%
Cow Creek ACEC						
<i>VRM Class I</i>	11%	32%	11%	32%	32%	32%
<i>VRM Class II</i>	19%	19%	68%	68%	68%	68%
<i>VRM Class III</i>	0%	0%	0%	0%	0%	0%
<i>VRM Class IV</i>	70%	49%	21%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%
WSAs						
<i>VRM Class I</i>	16%	100%	16%	100%	100%	100%
<i>VRM Class II</i>	19%	0%	19%	0%	0%	0%
<i>VRM Class III</i>	0%	0%	0%	0%	0%	0%
<i>VRM Class IV</i>	65%	0%	65%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%

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 environmental review.

About 76% of the UMNWSR would lie within VRM Class I and 22% within VRM Class II; 2% would be within VRM Classes III and IV. In the Cow Creek ACEC about 32% of the area would be within VRM Class I and 68% within VRM Class II (Table 4.15). This alternative would designate a VRM Class I rating for 100% of the WSAs.

VRM Class I – A total of 111,480 acres (30%) would be designated as VRM Class I, and surface-disturbing activities may not be authorized.

VRM Class II, III, and IV – The VRM Class II acreage would total 161,560 acres (43%). The VRM Class III acreage would total 24,770 acres (7%). The VRM Class IV acreage would total 77,190 acres (20%), a 30% decrease from Alternative A.

The visual contrast would be mitigated 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 4.16), 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 Classes II, III, and IV (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 35 natural gas wells in VRM Classes 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).

Alternative C

VRM Class I – For the 2,338 acres of oil and gas leases in VRM Class I (Table 4.17), 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 one natural gas well in VRM Class I.

VRM Class II, III and IV – For the 40,467 acres of oil and gas leases in VRM Classes II, III, and IV (Table 4.17), 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).

Table 4.16
Visual Resource Management Classes within the Existing Oil and Gas Leases
Alternatives A (Current Management) and B

	<i>Visual Resource Management Class</i>			
	<i>VRM Class I</i>	<i>VRM Class II</i>	<i>VRM Class III</i>	<i>VRM Class IV</i>
	<i>(acres)</i>	<i>(acres)</i>	<i>(acres)</i>	<i>(acres)</i>
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

Table 4.17 Visual Resource Management Classes within the Existing Oil and Gas Leases Alternative C				
	<i>Visual Resource Management Class</i>			
	<i>VRM Class I</i> <i>(acres)</i>	<i>VRM Class II</i> <i>(acres)</i>	<i>VRM Class III</i> <i>(acres)</i>	<i>VRM Class IV</i> <i>(acres)</i>
West HiLine Leases	92	7,454	1,566	1,216
Non-West HiLine Leases	2,246	25,532	3,157	1,542
Total	2,338	32,986	4,723	2,758

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 4.18). Based on the RFD, there is no potential for natural gas wells in VRM Class I.

VRM Class II – For the 39,869 of oil and gas leases in VRM Class II (Table 4.18), 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 4.18). Based on the RFD, there is no potential for 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 4.18), surface-disturbing activities may be prohibited. Based on the RFD, there is no potential for natural gas wells in VRM Class II.

For the West HiLine leases, surface disturbance would not be allowed on any portion of the leases regardless if the land is inside or outside the Monument. This includes the entire leasehold (12,782 acres). APDs on these leases would not be processed. The decision to not allow APDs to be processed would have no effect on visual resources.

Alternative E_{NL}

This sub-alternative considers the environmental effects of not leasing the 12 West HiLine leases. The effects to visual resources are the same as those from Alternative E, which would not allow surface-disturbing and disruptive activities on any of the 12 West HiLine oil and gas leases regardless if the land is inside or outside the Monument. This includes the entire leasehold (12,782 acres). The decision to not lease would have no effect on visual resources.

Table 4.18 Visual Resource Management Classes within the Existing Oil and Gas Leases Alternatives D and E		
	<i>Visual Resource Management Class</i>	
	<i>VRM Class I</i> <i>(acres)</i>	<i>VRM Class II</i> <i>(acres)</i>
West HiLine Leases	108	10,220
Non-West HiLine Leases	2,828	29,649
Total	2,936	39,869

Table 4.19
Visual Resource Management Classes within the Existing Oil and Gas Leases
Alternative F (Preferred Alternative)

	<i>Visual Resource Management Class</i>			
	<i>VRM Class I (acres)</i>	<i>VRM Class II (acres)</i>	<i>VRM Class III (acres)</i>	<i>VRM Class IV (acres)</i>
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

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 4.19). Based on the RFD, there is no potential for natural gas wells in VRM Class I.

VRM Class II, III, and IV – For the 39,869 acres of oil and gas leases in VRM Classes II, III, and IV (Table 4.19), 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 Classes 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 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 263,520 acres of which 16% could be related to natural gas activity.

Alternative C

There would be the potential for minor visual impacts on 62,000 acres of which 4% 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 313,000 acres of which 13% could be related to natural gas activity.

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 less stringent partial retention VRM Class III and modification VRM Class IV criteria would no longer apply to 52% of the Monument.

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 the Monument may be prohibited or denied if it fails to meet the visual objectives of VRM Classes I or II.

Alternative F (Preferred Alternative)

There would be the potential for minor or no visual impacts on 111,480 acres of the Monument, 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.

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 with a VRM Class IV category may have visual impacts including 4% associated with natural gas activities.

The four VRM classes would be represented, but at different percentages than under Alternative A. A majority of the Monument (73%) would be designated as VRM Classes I or Class II. This would represent a 25% increase in Monument 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. Implementing and enforcing Standards for Rangeland Health and Guidelines for Livestock Grazing Management will maintain and improve water resources. Healthy rangelands reduce erosion/sedimentation, slow runoff, increase sedimentation on banks and floodplains, and decrease the amount of pollutants such as sediment, fecal coliform, or nitrates entering the waterbody.

The BLM's goal is to achieve, or make significant progress toward, proper functioning condition in riparian and wetland areas. As a result of improving riparian areas, water quality is expected to improve. Improving riparian conditions imply that livestock are spending less time in and immediately adjacent to waterbodies. As a result, there would be a reduction in fecal contamination and nutrients. There would also be less direct trampling of banks and improved bank stability through vegetative improvements reducing both sediment and solar inputs. In addition, the improved riparian ground cover would

increase the filtration of sediment, nutrients, and bacteria. These factors would cumulatively result in a reduction of pollutants to most project area streams and would specifically address the probable sources of listing for the following 303(d) listed streams: Dog Creek, Fargo Coulee, Judith River, and the Missouri River (Table 3.6).

The reservation of water in Arrow Creek and the Judith River will have a positive impact on water resources within the Monument. Protecting the semi-natural flow regime in these watersheds will help to maintain the hydrologic systems within the Monument and the water-dependent objects of biological resources that are dependent on them.

The reservation could impact water rights within the Arrow Creek and the Judith River basins. If the existing water rights are senior to the date of the Monument Proclamation, no impact will occur as a result of the federal reserved water rights. The State of Montana has never allowed federal reserved rights to impact existing state-based water rights. Existing water rights junior to the date of the Monument Proclamation may be impacted if it is determined that the water use is harming BLM's water rights. Changes to existing water rights could, and probably would, also be affected. The BLM would likely object to any expansion of the existing water rights or to changes that would alter the flow regimes in ways that would negatively impact the federal reserved water right (i.e. changing an irrigation right from summer diversion to impoundment in a reservoir during spring runoff).

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. Wildfire generally burns with greater intensity than prescribed fire, which is carried out under specific conditions with identified resource objectives. High intensity wildfire may leave very little residual vegetation and can actually create hydrophobic soil conditions that not only inhibit infiltration but repel water. These factors can lead to larger levels of runoff, erosion, and subsequent sedimentation than lower intensity prescribed fires.

Alternatives A (Current Management) and B

Aggressive suppression and minimal prescribed fires could lead to excessive fuel build up and potentially larger and higher intensity wildland fires than would have occurred under historic conditions. These

alternatives 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. Wildfire generally burns with greater intensity than prescribed fire, which is carried out under specific conditions with identified resource objectives. High intensity wildfire may leave very little residual vegetation and can actually create hydrophobic soil conditions that not only inhibit infiltration but repel water. These factors can lead to larger levels of runoff, erosion, and subsequent sedimentation than lower intensity prescribed fires.

Alternatives D and E

Alternatives D and E would incorporate the natural role of fire in the landscape, thereby reducing fuel loading and decreasing the intensity of subsequent wildland fires. The result would be 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)

This alternative would incorporate the natural role of fire in the landscape, thereby reducing fuel loading and decreasing the intensity of subsequent wildland fires. The result would be fewer impacts to water resources than the other alternatives. Appropriate suppression response would be based on firefighter and public safety.

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.

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

No additional facilities would be developed; however, visitor use would be limited with an allocation system. This would provide more protection for water quality than Alternative A but less than Alternatives B, C, and D.

Alternative F (Preferred Alternative)

Additional facilities would be allowed between Fort Benton and Judith Landing but no development above Level 3 camp sites would be allowed elsewhere. Visitor use would not be limited but actions would be taken to reduce impacts to resources once standards and/or indicators are reached or exceeded. This would provide more protection for water quality than Alternatives A or E, but less than Alternatives B, C, and D.

Impacts to Water from Natural Gas Exploration and Development

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

The Proclamation does not allow new oil and gas leases in the Monument. The existing federal oil and gas leases in the Monument are considered to have valid existing rights. The difference in impacts to surface and groundwater from the conditions of approval under each alternative would be immeasurable. 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. Regardless of the alternative chosen, the minor amounts of surface disturbance may be controlled or excluded within 200 meters (656 feet) of the proposed site (43 CFR 3101.1-2). Existing laws and regulations that currently protect water resources would continue to be enforced. The difference in impacts to water resources from no surface disturbance within 500 feet, 656 feet, 1000 feet, and 1/4 mile of streams and riparian-wetland areas would be negligible. The differences between alternatives concerning disposal water and seismic operations would be so slight it would not be measurable. Existing oil and gas leases have the potential to produce small amounts of groundwater from the Judith River and Eagle formations within the Monument.

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.

Alternative E

Under Alternative E, no surface disturbance would be allowed on all 12 West HiLine oil and gas leases. No impacts to water resources would occur on the West HiLine leases. Conditions of approval would be applied to the non-West HiLine leases. The difference in impacts to water resources on the non-West HiLine leases compared to the other alternatives would be negligible.

Alternative E_{NL}

Under Alternative E_{NL}, the 12 West HiLine oil and gas leases would not be leased. No impacts to water resources would occur on the West HiLine leases.

Alternative F (Preferred Alternative)

The Proclamation does not allow new oil and gas leases in the Monument. The existing federal oil and gas leases in the Monument are considered to have valid existing rights. Developing existing leases would be subject to standard operating procedures and BMPs which minimize surface disturbance. The minor amounts of surface disturbance may be controlled or excluded within 200 meters (656 feet) of the proposed site (43 CFR 3101.1-2). Existing laws and regulations that currently protect water resources would continue to be enforced. Existing oil and gas leases have the potential to produce small amounts of groundwater from the Judith River and Eagle formations within the Monument.

No additional leases would be allowed in the Monument. The infrastructure already exists for most of the current leases.

Impacts to Water from Access and Transportation

Alternatives A (Current Management) and B

Additional roads in the Monument may increase erosion and 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)

Restricting vehicular access in sensitive areas would result in less erosion and sedimentation compared to Alternatives A and B.

Summary of Cumulative Impacts to Water

Impacts to Water Common to All Alternatives

The construction and operation of upstream dams on the Missouri and Marias Rivers has had a dramatic impact on the historic flow regime on the Missouri River. The flood recurrence interval has increased, thereby decreasing the frequency of flood events which are necessary to support flood and disturbance-dependent riparian vegetation and native fishes along the Missouri River. Although the BLM plans to attempt to coordinate high flow events with stakeholders and regulatory agencies on the Upper Missouri, these impacts will likely continue in the long term.

Agricultural activities and livestock grazing in the Monument and in watersheds that drain into the Monument have impacted water quantity and quality. These activities have led to a change in plant cover that has reduced soil-moisture storage and infiltration rates, and water quality impacts from bank trampling and animal wastes. Implementation of Standards for Rangeland Health within the watershed plans would help to mitigate this effect on BLM lands. However, overall the impacts will likely continue in the long term.

The largest hydrologic alterations on tributary streams to the Missouri River within the Monument are from irrigation diversions, stream channel modifications, and impoundments which occur predominantly outside Monument lands with the exception of stockwater reservoirs. A significant percentage of the watershed's

annual yield is consumed by these uses. These impacts will continue in the long term.

Oil and gas activities within the Monument have resulted in the production of small amounts of groundwater from the Eagle and Judith River formations. The Proclamation does not allow new oil and gas leases in the Monument. The existing federal oil and gas leases in the Monument are considered to have valid existing rights. The existing leases could result in the production of additional amounts of groundwater from the Eagle and Judith River formations. These minor impacts will continue for only as long as a lease is producing.

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.

Implementation of the completed watershed plans would have both short and long-term positive impacts to water resources by addressing grazing allotments not meeting Standards for Rangeland Health.

Alternatives C, D, and E

These alternatives would result in a gradual improvement in watershed conditions in the long term by considering the natural role of fire and improved wildlife habitat in fire management. Visitor use and services would be managed to protect resources and water quality, and restricted vehicular access in sensitive areas would decrease erosion and sedimentation compared to Alternatives A and B.

Implementation of the completed watershed plans would have both short and long-term positive impacts to water resources by addressing grazing allotments not meeting Standards for Rangeland Health.

Alternative F (Preferred Alternative)

This alternative would result in a gradual improvement in watershed conditions in the long term by considering the natural role of fire and improved wildlife habitat in fire management. Visitor use and services would be managed to protect resources and water quality, and restricted vehicular access in sensitive areas would decrease erosion and sedimentation compared to Alternatives A and B.

Implementation of the completed watershed plans would have both short and long-term positive impacts to water resources by addressing grazing allotments not meeting Standards for Rangeland Health.

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 (e.g., firewood, Christmas trees, post and poles). 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 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, 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 the Monument land but not beyond. Intentional and/or unintentional trespass may occur.

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)

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.

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. The Klabzuba pipeline corridor would be restricted to the width of the pipeline right-of-way (35 to 50 feet). The lack of defined corridors across Monument lands could lead to various rights-of-way approaching the designated corridors on the Missouri River from many different directions and then converging where they cross the river.

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, and D

Five designated utility and transportation corridors would confine future rights-of-way to areas that already contain visual intrusions such as roads, as opposed to crossing the Monument from diverse directions and converging as they approach the designated corridors on the river. The remaining three designated corridors at Fort Benton, Loma and Virgelle apply only to crossing

the Missouri River. The acreage within each of the defined boundaries is listed in Table 4.20.

Right-of-way applicants would be encouraged to locate their ROWs within the designated corridors or outside avoidance areas. Applicants for ROWs which cause surface disturbance or impact the visual resources would be restricted from locating within exclusion areas.

Table 4.20 Designated Utility and Transportation Corridors Alternatives B, C, and D	
<i>Corridor</i>	<i>Total BLM Acres</i>
DY Trail/Power Plant	9,820
Klabzuba	1,440
McClelland/Stafford Ferry	4,470
Secondary Highway 236	1,760
Highway 191	1,060
Highway 80	Missouri River Crossing Only
Loma	Missouri River Crossing Only
Virgelle Ferry	Missouri River Crossing Only

Alternative E

Five designated utility and transportation corridors would confine future rights-of-way to areas that already contain visual intrusions such as roads, as opposed to crossing the Monument from diverse directions and converging as they approach the designated corridors on the river. The remaining three designated corridors at Fort Benton, Loma and Virgelle only apply to crossing the Missouri River. The acreage within each of the defined boundaries is listed in Table 4.21.

Right-of-way applicants would be encouraged to locate their ROWs within the designated corridors or outside avoidance areas. Applicants for ROWs which cause surface disturbance or impact the visual resources would be restricted from locating within exclusion areas.

Alternative F (Preferred Alternative)

The impacts would be similar to Alternatives B, C, and D except the corridor on the south side of the river for State Highway 236 would be two miles wide until the top of Reed Hill. The acreage within each of the defined boundaries is listed in Table 4.22 and shown on Map 1.

Table 4.21 Designated Utility and Transportation Corridors Alternative E	
<i>Corridor</i>	<i>Total BLM Acres</i>
DY Trail/Power Plant	4,950
Klabzuba	750
McClelland/Stafford Ferry	2,404
Secondary Highway 236	880
Highway 191	750
Highway 80	Missouri River Crossing Only
Loma	Missouri River Crossing Only
Virgelle Ferry	Missouri River Crossing Only

Table 4.22 Designated Utility and Transportation Corridors Alternative F (Preferred Alternative)	
<i>Corridor</i>	<i>Total BLM Acres</i>
DY Trail/Power Plant	9,820
Klabzuba	1,440
McClelland/Stafford Ferry	4,470
Secondary Highway 236	2,060
Highway 191	Missouri River Crossing Only
Highway 80	Missouri River Crossing Only
Loma	Missouri River Crossing Only
Virgelle Ferry	Missouri River Crossing Only

Land Ownership Adjustment

Alternative A (Current Management)

Based on the State Director’s Interim Guidance for managing the Monument, no lands would be identified for disposal and there would be no impact.

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

Disposal of the identified 80 acres of BLM land on the edge of the Monument would result in the loss of less than five acres of breaks topography. It is possible the land would be converted to hay or some other crop; it

may also continue to be used as grazing land. Vegetative resources that would be lost consist of native grasses, sagebrush and domestic (alfalfa) vegetation.

Acquisition of the two privately owned lots, comprising 71.12 acres, would bring an additional 30 to 40 acres of breaks topography under public ownership. Additional resources gained would consist of native grasses and riparian vegetation, wildlife and fisheries habitat, potential campsites for river recreationists, and one-half mile of Missouri River frontage.

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 several 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)

If the streams are not recommended as suitable, there would be no impact. Cow Creek and/or Dog Creek are included under several 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.

Impacts to Lands and Realty from Natural Gas Exploration and Development

Alternative A (Current Management)

Right-of-way applicants may need to relocate their proposed projects and may incur more expense in order to avoid slopes over 30%, or over 20% if they contain extremely erosive or slumping soils.

Alternative B

Right-of-way applicants may see their proposed projects delayed, and/or become less cost effective when they are located on slopes exceeding 30%.

Alternatives C and D

Right-of-way applicants may see their proposed projects delayed, and/or become less cost effective when they are located on slopes exceeding 30% or slopes exceeding 20% which contain extremely erosive or slumping soils.

Alternative E

There would be no impacts under the “no lease” alternative.

Alternative F (Preferred Alternative)

Right-of-way applicants may see their proposed projects delayed, and/or become less cost effective when they are located on slopes exceeding 30% or slopes exceeding 20% which contain extremely erosive or slumping soils.

Right-of-way applicants’ proposals may be rejected when located on slopes of 40% or greater.

Summary of Cumulative Impacts to Lands and Realty

Alternative A (Current Management)

Right-of-way applicants may see their proposed projects delayed, and/or become less cost effective in order to avoid or mitigate impacts to sensitive areas or habitat.

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

Rights-of-Way

Right-of-way applicants may see their proposed projects delayed, and/or become less cost effective in order to avoid or mitigate impacts to sensitive areas or habitat.

Land Ownership Adjustment

The public would gain additional breaks topography, riparian vegetation, wildlife and fisheries habitat, river frontage, and campsite opportunities.

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 Proposed RMP/Final 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 or administrative decision. Under anticipated future conditions, this is expected to be relatively minor and would only occur in areas where emphasis for habitat maintenance and development would be placed on present and potential habitat for sensitive, threatened and/or endangered species, nesting waterfowl, game birds, fisheries, and mule deer and elk winter range.

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. With better located range improvements, the risk of land health standards being in jeopardy would be

reduced and there would be less likelihood of needing to make changes to livestock grazing management.

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 Management 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 meeting Standards for Rangeland Health. 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 invasions of noxious weeds (lost forage and escalating weed treatment costs).

Water

The reserved water right (as established through the Proclamation) for Arrow Creek and the Judith River carries a priority date of 2001. If the existing water rights are senior to the date of the Proclamation, no impact will occur as a result of the federal reserved water right. The State of Montana has never allowed federal reserved rights to impact existing state-based water rights.

Existing water rights junior to the date of the Proclamation may be impacted if it is determined that the water use is harming BLM's water rights. Changes to existing water rights could also be affected. The BLM would likely object to any expansion of the existing water rights or to changes that would alter the flow regimes in ways that would negatively impact the federal reserved water right (i.e. changing an irrigation right

from summer diversion to impoundment in a reservoir during spring runoff).

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 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 this Proposed RMP/Final EIS.

Recreation

Recreational activities could 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 very short (during landing, taxi and take off). Current and anticipated use of backcountry airstrips is very low (estimated at 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, impacts 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 impacts 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 use of prescribed fire could benefit grazing in the long term by increasing the production of herbaceous species, making more forage available for allocation to livestock. An increase in herbaceous production does not necessarily mean an increase in allocation for livestock. 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 rangeland 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 slight 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 in identified winter range. 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 of 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 could benefit grazing in the long term by increasing the production of herbaceous species making more forage available for what is allocated to livestock. An increase in herbaceous production does not necessarily mean an increase in allocation for livestock. 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 non-native grasses on BLM lands for spring and 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 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 a 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 would be 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. Overall, the approximately 500 acres of prairie dog towns are not anticipated to increase or decrease substantially and would not impact forage available for livestock in the Monument. Controlling prairie dog towns when they are compromising Standards for Rangeland Health would benefit grazing through increased productivity of forage.

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 for 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 for 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 for 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 for 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 hinder some work related to livestock grazing because of the requirement to limit surface-disturbing and disruptive activities to certain time periods. These impacts would occur on a rare basis. Overall, the impacts would be

minimal since most limitations on surface disturbance would occur in early spring and winter, while most surface-disturbing activities are scheduled for summer or fall.

Limiting seasons of operation for surface-disturbing and disruptive 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.

Restrictions to protect 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.

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

In instances where forage is lost or unavailable (e.g., wildland fire, prescription burns, specific vegetation or habitat treatments) operators would need to reduce AUMs and/or seasons of use, at least in the short term, which would be an adverse impact. The significance of an adjustment is highly variable depending on the scale of the loss.

Alternative F (Preferred Alternative)

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.). 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.

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. Increased costs of operation would be in time spent recovering livestock that were not adequately contained. Some water sources that might be in the interest of livestock, but not in the interest of other resource values would be foregone, 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 revision in the type, location, and number of water developments in important habitats and changes in the availability of forage for livestock. 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. New developments could be approved in all VRM classes with appropriate design that maintains the long-term objectives of visual resource management. Maintenance of existing improvements would be allowed within the area of previous disturbance.

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)

Improved production of herbaceous understory could provide a small amount of available forage for livestock in the localized area; however, the amount would be inconsequential on the scale of the Monument.

Fire Management

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

Some negative impacts could occur 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

There would be no impact.

Alternative E

As long as Standards for Rangeland Health are being met, a recommendation that three eligible stream segments are suitable for inclusion in the National Wild and Scenic Rivers system would not impact grazing.

Alternative F (Preferred Alternative)

There would be no impact.

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)

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. Since these events are uncommon and localized when they do occur, the impact would be inconsequential on the scale of the Monument.

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 potential impacts to livestock grazing; however, these impacts could be mitigated with public information.

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 impacts could be mitigated with public information.

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 impacts could be mitigated with public information.

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 impacts could be mitigated with public information.

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.

Motorized Watercraft – There could be an adverse impact caused by the inability to transport fencing materials to riparian enclosures 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. However, by raising public awareness these conflicts could be minimized.

Camping Facilities – Established campsites could create some potential for impacts to livestock grazing; however, these impacts could be mitigated with public information.

Uplands SRMA

Alternative A (Current Management)

Motorized tours could impact livestock grazing activities with occasional disruption of livestock and the potential for gates being left open; however, these impacts 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 for gates being left open; however, these impacts 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 for gates being left open; however, these impacts could be mitigated with user education.

Alternative F (Preferred Alternative)

Motorized tours could impact livestock grazing activities with occasional disruption of livestock and the potential for gates being left open; however, these impacts could be mitigated with user education.

Impacts to Livestock Grazing from Natural Gas Exploration and Development

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

Seismic Operations – 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 from 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 and leave fences and range improvements in place.

Alternative E

The impacts would be similar to Alternatives A, B, C, and D, except for the West HiLine leases, surface disturbance would not be allowed on any portion of the leases regardless if the land is inside or outside the Monument. This includes the entire leasehold (12,782 acres). APDs on these leases would not be processed. The decision to not allow APDs to be processed would have no effect on livestock grazing.

Alternative E_{NL}

The impacts would be similar to Alternatives A, B, C, and D, except this sub-alternative considers the environmental effects of not leasing the 12 West HiLine leases. The effects to livestock grazing are the same as those from Alternative E, which would not allow surface-disturbing and disruptive activities on any of the 12 West HiLine oil and gas leases regardless if the land is inside or outside the Monument. This includes the entire leasehold (12,782 acres). The decision to not lease would have no effect on livestock grazing.

Alternative F (Preferred Alternative)

Seismic Operations – 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 from 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 and leave fences and range improvements in place.

Impacts to Livestock Grazing from Access and Transportation

BLM Road System

Alternatives A (Current Management), B, and C

Since authorized users (grazing permittees) have the option to travel off road and on closed roads for administrative purposes there would be no 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 affect day-to-day operations.

Bighorn Sheep Lambing Areas – The limitation on use of roads may create some difficulty for those 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 affect day-to-day operations.

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 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)

Since authorized users (grazing permittees) have the option to travel off road and on closed roads for administrative purposes there would be no impact to livestock grazing.

Road System Criteria – There would be no impact.

Summary of Cumulative Impacts to Livestock Grazing

The impacts to livestock grazing have been discussed and analyzed in previous RMPs/EISs, and Standards for Rangeland Health and subsequent implementation in watershed and other activity plans.

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 localized impacts to livestock grazing and most often be an inconvenience rather than a significant impact on the scale of the Monument. Limitations for installation and maintenance of improvements and use of roads would be mitigated with allowance for grazing permittees to use closed roads and travel cross country for administrative purposes.

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. The current operator would be allowed to continue using the existing pipeline; however, upgrades to the pipeline would not be considered. This could also cause industry additional expense to find a more suitable route than what currently exists because the current route would not be a designated corridor crossing the Missouri River. If industry discovered natural gas south of the Monument (i.e., Fergus County or other adjacent counties) and required more capacity than the current pipeline could provide, they would not be allowed to use this corridor to transport gas across the river in order to market their gas to the north. Industry would be required to use one of the seven other corridors to transport/pipeline their gas to market since the majority of gas markets and pipeline infrastructure that serve the area south of the Missouri River are located north of the river.

Under the RFD scenario, two wells were anticipated to be drilled in the Southeast Leroy area in or near the Monument. The current pipeline would likely be able to handle production from these wells, but if a major discovery was made in or outside of the Monument, another pipeline route would likely be required. Depending on the volume of gas needing to be transported, construction of a new pipeline may be required within one of the other seven corridors. The closest corridor to the existing Klabzuba pipeline is approximately two miles upriver (the McClelland (Lloyd)/Stafford Ferry road). Depending on the location and size of a discovery, it may or may not be economic to construct a new pipeline into a potential discovery.

Avoidance Areas – This alternative may affect the ability to transport natural gas or access 1,440 acres (4%) of four non-West HiLine leases (MTM2060, MTM2061, MTM13818 and MTM16098) within the Ervin Ridge WSA and 2,331 acres of 5 non-West HiLine leases (MTM13818, MTM13821A, MTM18274, MTM18282 and MTM18283) 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. This alternative would affect the majority of the leased minerals because most of the soils are sedimentary Breaks soils (i.e., severely erodable and/or slumping soils); however, drilling operations would be allowed to set up on severely erodable and/or slumping

soils with slopes of less than 20% on the West HiLine leases/some non-West HiLine leases, and the standard lease terms would apply for the other leases. Per the RFD scenario, this would allow 35 of 56 possible wells to be drilled (11 wells denied) in acceptable areas under Alternative A. Six of the 11 wells would be denied due to the wells being located on severely erodable and/or slumping soils with slopes greater than 20%. This would result in operators not being able to drill wells where they would like or moving the well so far away from the initial location that it may not be feasible to drill.

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. This alternative would allow the current operator to continue to use the existing pipeline that crosses the river and infrastructure; however, if an upgrade to the pipeline was necessary, it would likely not be considered. This could also cause industry additional expense to find more suitable routes outside of what currently exists because the current route would not be allowed through the UMNWSR as an upgrade. If industry discovered natural gas south of the Monument (i.e., Fergus County or other adjacent counties) and wished to market this gas to the north, they would be excluded from crossing the UMNWSR except for one of the seven allowed corridors. The closest allowable corridor to the existing Klabzuba pipeline is approximately 2 miles up river (the McClelland (Lloyd)/Stafford Ferry road).

Under the RFD scenario, two wells are anticipated to be drilled in the Southeast Leroy area in or near the Monument. The current pipeline would likely be able to handle production from these wells, but if a major discovery was made in or outside of the Monument and it was in Fergus County, another pipeline route would likely be required depending on the volume of gas needing to be transported. By removing the Klabzuba pipeline corridor, this alternative may add additional expense and surface impacts by requiring pipeline construction to follow another route.

Alternatives B, C, D, E, E_{NL}, 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 (1/4 mile under Alternative E). The alternative would allow industry to continue to use a new corridor to pipeline the gas to market. The major markets and pipeline infrastructure that serve this area are north of the river. The volume that currently produces from the five wells south of the river is approximately 10,000 MCF per month of natural gas (all having federal interest). These

alternatives would allow the existing gas production to continue using this corridor to pipeline gas to the north side of the river. Under the RFD scenario, two wells are anticipated to be drilled in the Southeast Leroy area. This corridor may promote future exploration and development in and outside of the Monument. If a future discovery is made south of the river, shorter distances of pipeline would potentially need to be constructed (depending on the location and size of a discovery) to convey the gas to market.

Avoidance Areas – These alternatives may affect the ability to transport natural gas or access 2,331 acres of 5 non-West HiLine leases (MTM13818, MTM13821A, MTM18274, MTM18282 and MTM18283) 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. As a worst case scenario of the referenced resources, the alternatives would affect the majority of the leased minerals because most of the soils within the Monument are sedimentary Breaks soils which are highly erosive. The effects on the number of wells to be drilled by alternative are as follows:

- Alternatives B, C, and D – 0 wells may not be drilled because of soils.
- Alternatives E and E_{NL} – 10 wells may not be drilled because of soils.
- Alternative F (Preferred Alternative) – 4 wells may not be drilled because of soils.

Under Alternative F, drilling operations would be allowed to set up on severely erodable and/or slumping soils with slopes greater than 20% on the 43 leases and an engineering and reclamation plan must be approved by the authorized officer. No surface-disturbing activities would be allowed on slopes 40% and greater. Exceptions would apply to pipelines for short distances (less than 300 feet). Per the RFD scenario, this would allow 34 of 56 possible wells to be drilled in acceptable areas. Twelve potential wells would be denied for resource reasons. Of those, four may be denied due to their location on severely erodable and/or slumping soils with slopes greater than 20%, unless the operator provides, and the authorized officer approves, an engineering and reclamation plan for those wells located on slopes between 20% and 40% grades. This may result in operators not being able to drill wells where they would like or being required to move the well so far away from the initial location that it may not be feasible to drill.

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. The alternatives would allow the current operator to continue to use the existing pipeline that crosses the river and infrastructure. If an upgrade to the pipeline was necessary, it would be considered under these alternatives. This would allow industry to continue to use and upgrade the pipeline in this corridor if necessary. If industry discovered natural gas south of the Monument (i.e., Fergus County or other adjacent counties) and wished to market this gas to the north, they would be allowed to use the Klabzuba pipeline corridor or any of the other seven allowed corridors.

Under the RFD scenario, two wells are anticipated to be drilled in the Southeast Leroy area in or near the Monument. The Klabzuba pipeline corridor may promote future exploration and development in and outside of the Monument. If a future discovery is made south of the river, shorter distances of pipeline would potentially need to be constructed (depending on the location and size of a discovery) to convey the gas to market.

Wild and Scenic Rivers

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

There would be no impact, as management changes would not affect oil and gas minerals.

Impacts to Minerals – Oil and Gas from Natural Gas Exploration and Development

The alternatives discussed below contain varying degrees of restrictions on the ability of oil and gas operators to explore, develop or produce natural gas in the Monument. (As previously discussed in Chapter 3, there are no known discoveries of oil in the study area). The restrictions include timing, controlled surface use, and no surface-disturbing or disruptive activities. As more layers of restrictions are added, operators could incur more expenses and be less able to conduct business. All of the alternatives, except for Alternatives E and E_{NL}, allow for some future exploration and development to occur on the 43 existing leases. Since varying layers of restrictions are applied by alternative and resource, it may be difficult to comprehend the full effects on an operator's ability to develop the natural gas resource by reviewing individual segments. The Summary of Cumulative Impacts to Minerals – Oil and Gas discusses the number of wells that could be drilled by applying the reasonable foreseeable development (RFD) scenario to each alternative in order to demonstrate the full impacts

from resource restrictions and specific operating requirements.

Each alternative affects the ability of an oil and gas operator to conduct exploration activities based on the various conditions of approval (restrictions) to protect the objects in the Monument. Alternative B most closely compares with oil and gas operations prior to the Monument. The restrictions gradually increase from Alternative B through Alternatives E and E_{NL}. Under Alternatives E and E_{NL}, no development drilling would occur on any of the 43 leases within the Monument, and while existing lease operations would be allowed to continue, day-to-day operations could be partially impeded by the alternatives' restrictions. Operators would continue to produce the existing wells until they are depleted and then the wells would be plugged and abandoned. For some of the existing wells, this could be as soon as a few years out, and for others it would be at least 20 years until the last existing well is plugged and abandoned in the Monument.

Alternative A (Current Management)

Stipulations/Conditions of Approval – The stipulations and conditions of approval would affect a portion of the oil and gas leases in the Monument (Table 4.23).

Greater Sage-Grouse – Currently there are no known leks within 1/4 mile of the West HiLine leases. For the non-West HiLine leases, if a 1/4-mile restriction is applied as a condition, 31 acres would be affected. This acreage lies within a high potential for gas occurrence and in a high potential for additional wells to be drilled; however, a total of 2,560 acres of the affected lease lie within the Monument and it is doubtful that restricting 31 acres of the total would affect the ability of the operator to develop their lease.

For nesting areas, a timing restriction could affect 1,291 acres of 5 West HiLine leases, and if a similar restriction is applied as a condition to the non-West HiLine leases, an additional 4,083 acres would be affected. This timing restriction would preclude activities for 122 days from March 1 to June 30. This would impede the ability of the operator as to the timeframe allowed to develop the lease(s); however, it also allows 243 days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the same 243 open days of the year.

For winter habitat, the timing restriction would affect 955 acres of 4 West HiLine leases with a 166-day restriction from December 1 to May 15. This would impede on the ability of the operator as to the timeframe allowed to develop the lease(s); however, it also would allow 199 open days of the year for the operator to explore and develop their lease(s), provided there are no

other timing restrictions over the same area during the same 199 open days of the year.

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. This acreage lies within an area containing high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 800 acres of the affected lease lie within the Monument and it is doubtful that restricting 72 acres would affect the ability of the operator to develop their 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 one 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). The affected West HiLine lease acreage lies within a high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 1,416 acres of the affected lease lie within the Monument and it is doubtful that restricting 3 acres on this much acreage would affect the ability of the operator to develop their lease, based on this resource alone. Other resource issues regarding this lease, including steep slopes and bighorn sheep habitat, would be likely to be more restrictive than this resource by itself on the ability of the operator to develop their lease. For the six affected non-West HiLine leases, the affected lease acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 10,565 acres of the affected leases lie within the Monument and it is doubtful that restricting 532 acres on this much acreage would affect the ability of the operator to develop their lease based on this resource alone. Other resource issues regarding these leases would likely to be more restrictive than this resource by itself on the ability of the operator to develop their lease.

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 10,328 acres (100%) of 12 West HiLine leases in mule deer winter range, 6,779 acres (89%) of 9 West HiLine leases in elk winter range, and 3,804 acres (49%) of 9 West HiLine leases in antelope winter range. If this timing restriction is applied as a condition to the non-West HiLine leases, an additional 32,477 acres of 31 leases would be affected by

mule deer winter range, 23,323 acres of 22 leases would be affected by elk winter range, and 7,039 acres of 9 leases would be affected by antelope winter range. This timing restriction would preclude activities for a period of 166 days. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 199 open days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the 199 open 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 by potentially delaying the operation 60 days or moving the operation 200 meters to reduce the effect on bighorn sheep. Delaying the operation would likely not affect the ability of the operator to develop the resource; however, moving the operation 200 meters could cause the operator to locate the well operation far enough away from the target to cause a difference between a dry hole and a producing gas well. The operator could use the option of directional drilling, but this could increase the cost of the operation to an extent that it may make the operation unfeasible.

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 by potentially delaying the operation 60 days or moving the operation 200 meters to reduce the effect on bighorn sheep lambing areas. Delaying the operation would likely not affect the ability of the operator to develop the resource; however, moving the operation 200 meters could cause the operator to locate the well operation far enough away from the target to cause a difference between a dry hole and a producing gas well. The operator could use the option of directional drilling, but this could increase the cost of the operation to an extent that it may make the operation unfeasible.

Streams – Surface-disturbing activities may be restricted on 2,303 acres (25%) of 10 West HiLine leases and 6,618 acres (21%) of 25 non-West HiLine leases. The affected West HiLine lease acreage lies within high and moderate potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 9,128 acres of the affected leases lie within the Monument and it may restrict enough activities on 2,303 acres to affect the ability of the operator to develop their lease based on this resource alone. For the 25 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 31,135 acres of the leases lie within the Monument and it may restrict enough activities on 6,618 acres to affect the ability of the operator to develop their lease based on this resource alone. Three RFD Monument wells would not be drilled.

Soils/Slopes – Surface-disturbing activities may 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. The 10 affected West HiLine lease acreages lie within high and moderate potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 10,072 acres of the affected leases lie within the Monument and it may restrict enough activities on 3,394 acres to affect the ability of the operator to develop their lease based on this resource alone. For the 30 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 32,464 acres of the affected leases

lie within the Monument and it may restrict enough activities on the 10,687 acres that it could affect the ability of the operator to develop their lease based on this resource alone. Five RFD Monument wells would not be drilled.

Visual Resources – A controlled surface use requirement would affect all the oil and gas leases (Table 4.23) by potentially delaying an operation 60 days or moving the operation 200 meters in order meet visual resource standards. Delaying the operation would likely not affect the ability of the operator to develop the resource; however, moving the operation 200 meters could cause the operator to locate the operation far enough away from a target to cause a difference between a dry hole and a producing gas well. The operator could use the option of directional drilling, but this could increase the cost of the operation to an extent that it may make it unfeasible.

Table 4.23
Oil and Gas Leases Affected by the Stipulations and Likely Conditions of Approval
Alternative A (Current Management)

<i>Stipulation/Condition of Approval</i>	<i>West HiLine Leases</i>		<i>Non-West HiLine Leases</i>		<i>All Leases</i>	
	<i>No.</i>	<i>Acres</i>	<i>No.</i>	<i>Acres</i>	<i>No.</i>	<i>Acres</i>
Greater Sage-Grouse						
Lek			<i>1</i>	<i>31</i>	<i>1</i>	<i>31</i>
Nesting Area	<i>5</i>	<i>1,291</i>	<i>7</i>	<i>4,083</i>	<i>12</i>	<i>5,374</i>
Winter Habitat	<i>4</i>	<i>955</i>	<i>8</i>	<i>819</i>	<i>12</i>	<i>1,774</i>
Black-tailed Prairie Dog	<i>1</i>	<i>72</i>			<i>1</i>	<i>72</i>
Designated Sensitive Species	<i>1</i>	<i>3</i>	<i>6</i>	<i>532</i>	<i>7</i>	<i>535</i>
Mule Deer Winter Range	<i>12</i>	<i>10,328</i>	<i>31</i>	<i>32,477</i>	<i>43</i>	<i>42,805</i>
Elk Winter Range	<i>9</i>	<i>6,779</i>	<i>22</i>	<i>23,323</i>	<i>31</i>	<i>30,102</i>
Antelope Winter Range	<i>9</i>	<i>3,804</i>	<i>14</i>	<i>7,039</i>	<i>23</i>	<i>10,843</i>
Bighorn Sheep Distribution	<i>4</i>	<i>3,080</i>	<i>13</i>	<i>11,164</i>	<i>17</i>	<i>14,244</i>
Bighorn Sheep Lambing	<i>4</i>	<i>1,059</i>	<i>11</i>	<i>5,504</i>	<i>15</i>	<i>6,563</i>
Streams & Riparian/Wetland Areas	<i>10</i>	<i>2,303</i>	<i>25</i>	<i>6,618</i>	<i>35</i>	<i>8,921</i>
Soils/Slopes						
20% & Severely Erodable	<i>10</i>	<i>2,373</i>	<i>30</i>	<i>10,687</i>	<i>40</i>	<i>13,060</i>
30%	<i>9</i>	<i>1,683</i>	<i>29</i>	<i>5,352</i>	<i>38</i>	<i>7,035</i>
VRM Class						
Class I	<i>1</i>	<i>92</i>	<i>6</i>	<i>1,386</i>	<i>7</i>	<i>1,478</i>
Class II	<i>6</i>	<i>3,789</i>	<i>23</i>	<i>16,470</i>	<i>29</i>	<i>20,259</i>
Class IV	<i>10</i>	<i>6,447</i>	<i>14</i>	<i>14,621</i>	<i>24</i>	<i>21,068</i>

Seismic Operations – Operators would be allowed to gain access as long as they could demonstrate that the proposed transportation and exploration methods would minimize the potential for creation of new roads and trails and not interfere with sensitive wildlife areas. Allowing access to conduct seismic surveys would allow operators to procure better information which may yield better decisions about how to develop the existing leases. This may lead to a more efficient method of conducting exploration within the Monument and may lead to fewer roads and unnecessary wells drilled and more productive wells drilled.

Drilling Operations – Based on the RFD, by 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 21 wells within 1/2 mile of the Monument on federal minerals. One RFD well would not be drilled in the Monument based on well spacing.

This alternative would allow standard operating procedures and unrestricted access to monitor wells and facilities and would create only minimal impact on the ability to develop the natural gas resource.

Production Operations, Facilities and Equipment – The placement and construction of pipelines, including cross-country pipelines, would follow standard operating procedures (under guidance from the 4th Edition, 2006 Gold Book). This would create minimal impacts to the ability to develop the natural gas resource.

The production of natural gas would follow current regulations and standards to dispose of produced water. This would create no additional impact to the ability to produce the natural gas resource.

All current standards for oil and gas reclamation meet or exceed the reclamation requirements of this alternative, and there would be only minimal impacts to the natural gas resource.

Alternative B

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 – A condition of approval would prohibit surface-disturbing or disruptive activities 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. This acreage lies within a high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 2,560 acres of the affected lease lie within the Monument and it is doubtful that restricting 31 acres of the total would affect the ability of the operator to develop their lease.

For nesting areas, the timing restriction from March 1 to June 15 would affect 1,291 acres of 5 West HiLine and 4,083 acres of 7 non-West HiLine oil and gas leases with a 107-day restriction. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 258 days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the same 258 open days of the year.

For winter habitat, the timing restriction from December 1 to March 31 would affect 955 acres of 4 West HiLine oil and gas leases and 819 acres of 8 non-West HiLine leases with a 121-day restriction. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 244 open days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the same 244 open days of the year.

Black-tailed Prairie Dogs – A condition of approval would prohibit surface-disturbing or disruptive activities 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. This acreage lies within an area containing high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 800 acres of the affected lease lie within the Monument and it is doubtful that restricting 72 or 100 acres would affect the ability of the operator to develop their lease.

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 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-disturbing or disruptive activities on identified winter ranges from December 1 to March 31. This timing restriction would affect 10,328 acres (100%) of 12 West HiLine leases in mule deer winter range, 6,779 acres (89%) of 9 West HiLine leases in elk winter range, and 3,804 acres (49%) of 9 West HiLine leases in antelope winter range. If this timing restriction is applied as a condition to the non-West HiLine leases, it would affect an additional 32,477 acres of 31 leases in mule deer winter range, 23,323 acres of 22 leases in elk winter range, and 7,039 acres of 9 leases in antelope winter range for a period of 121 days. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 244 open days of the year for the operator to explore and develop their lease(s), provided there are

no other timing restrictions over the same area during the 244 open days.

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

Bighorn Sheep Lambing Areas – A condition of approval would prohibit surface-disturbing or disruptive activities in identified bighorn sheep lambing areas from April 1 to June 15. This timing restriction would affect 1,059 acres (27%) of 4 West HiLine leases and 5,504 acres (50%) of 11 non-West HiLine leases for a period of 76 days. This would impede on the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 289 open days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the 289 open days.

Streams – Surface-disturbing activities would be prohibited within stream channels. There would be minimal impacts to the ability to develop the natural gas resource.

Soils/Slopes – Surface-disturbing activities 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. The 9 affected West HiLine lease acreages lie within high and moderate potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 8,941 acres of the affected leases lie within the Monument and it may restrict enough activities on 1,683 acres to affect the ability of the operator to develop their lease based on this resource alone. For the 29 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled.

A total of 32,264 acres of the affected leases lie within the Monument and it may restrict enough activities on 5,352 acres that it could affect the ability of the operator to develop their lease based on this resource alone. One of the RFD Monument wells would be affected.

Table 4.24 Oil and Gas Leases Affected by the Conditions of Approval Alternative B						
<i>Stipulation/Condition of Approval</i>	<i>West HiLine Leases</i>		<i>Non-West HiLine Leases</i>		<i>All Leases</i>	
	<i>No.</i>	<i>Acres</i>	<i>No.</i>	<i>Acres</i>	<i>No.</i>	<i>Acres</i>
Greater Sage-Grouse						
Lek			1	31	1	31
Nesting Area	5	1,291	7	4,083	12	5,374
Winter Habitat	4	955	8	819	12	1,774
Black-tailed Prairie Dog	1	72			1	72
Mule Deer Winter Range	12	10,328	31	32,477	43	42,805
Elk Winter Range	9	6,779	22	23,323	31	30,102
Antelope Winter Range	9	3,804	14	7,039	23	10,843
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%	9	1,683	29	5,352	38	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

Seismic Operations – Operators would be allowed to gain access as long as they could demonstrate that the proposed transportation and exploration methods would minimize the potential for creation of new roads and trails and not interfere with sensitive wildlife areas. Allowing access to conduct seismic surveys would allow operators to procure better information which may yield better decisions about how to develop the existing leases. This may lead to a more efficient method of conducting exploration within the Monument and may lead to fewer roads and unnecessary wells drilled and more productive wells drilled.

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 (e.g., 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 minimal impacts to the ability to produce the natural gas resource.

Production Operations, Facilities and Equipment – This alternative would increase the costs to mitigate noise levels and abate emissions on gas compression facilities. These types of requirements would have a minimal effect on the ability to produce the natural gas resource.

The placement and construction of pipelines, including cross-country pipelines, would follow standard operating procedures (4th Edition, 2006 Gold Book). There would be no impact to the ability to produce 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 ability to produce the natural gas resource.

All current standards for oil and gas reclamation meet or exceed the reclamation requirements of this alternative, and there would be no impact to the ability to produce the natural gas resource.

Alternative C

Conditions of Approval – The conditions of approval would affect a portion of the oil and gas leases in the Monument (Table 4.25).

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-disturbing or disruptive activities on prairie dog towns. This would affect 72 acres of one West HiLine oil and gas lease. If prairie dogs are allowed to expand, it could affect up to 100 acres. This acreage lies within an area containing high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 800 acres of the affected lease lie within the Monument and it is doubtful that restricting 72 or 100 acres would affect the ability of the operator to develop their lease.

Designated Sensitive Species – A condition of approval would prohibit surface-disturbing or disruptive activities within identified habitat or within 1/4 mile of active nests. This would affect 3 acres (<1%) of one West HiLine and 532 acres of six non-West HiLine leases. The affected West HiLine lease acreage lies within a high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 1,416 acres of the affected lease lie within the Monument and it is doubtful that restricting 3 acres of the total would affect the ability of the operator to develop their lease based on this resource alone. For the six affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 10,565 acres of the affected leases lie within the Monument and it is doubtful that restricting 532 acres of the total would affect the ability of the operator to develop their lease based on this resource alone. Other resource issues regarding these leases (including steep slopes and bighorn sheep habitat) would likely be more restrictive than this resource by itself on the ability of the operator to develop their lease.

Bald Eagle – A condition of approval would prohibit surface-disturbing or disruptive activities within 1/2 mile of any nest that has been active within the last 7 years. Currently, no known roosting or nesting sites are 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-disturbing or disruptive activities in identified bighorn sheep distribution areas from December 1 to March 31. This timing restriction would affect 3,080 acres (78%) of 4 West HiLine leases and 11,164 acres (75%) of 13 non-West HiLine leases for a period of 121 days. This impedes on the ability of the operator as to when they are allowed to develop the

lease, however it also allows 244 open days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the 244 open days.

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

Streams – Surface-disturbing activities would be prohibited within 1,000 feet of streams. This would affect 4,339 acres of 11 West HiLine leases and 12,171 acres of 25 non-West HiLine leases. The 11 affected West HiLine lease acreages lie within high and moderate potential for gas occurrence and high potential for additional wells to be drilled, however there is a total of 9,208 acres of the affected leases within the Monument and it may restrict enough activities on 4,339 acres that it could affect the ability of the operator to develop their lease based on this

resource alone. The 25 affected non-West HiLine lease's acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled.

A total of 30,935 acres of the affected leases lie within the Monument and it may restrict enough activities on 12,171 acres to affect the ability of the operator to develop their lease based on this resource alone. Fifteen of the RFD Monument wells would be affected.

Soils/Slopes – Surface-disturbing activities would be restricted on slopes over 30% or on slopes over 20% with severely erodible and slumping soils and would require an engineering and reclamation plan approved by the authorized officer. Surface-disturbing activities would be prohibited on slopes 40% and greater. This would affect 2,373 acres of 10 West HiLine leases and 10,687 acres of 30 non-West HiLine leases.

<i>Stipulation/Condition of Approval</i>	<i>West HiLine Leases</i>		<i>Non-West HiLine Leases</i>		<i>All Leases</i>	
	<i>No.</i>	<i>Acres</i>	<i>No.</i>	<i>Acres</i>	<i>No.</i>	<i>Acres</i>
Greater Sage-Grouse						
Lek Nesting Area			<i>1</i>	<i>31</i>	<i>1</i>	<i>31</i>
Winter Habitat	<i>5</i>	<i>1,291</i>	<i>7</i>	<i>4,083</i>	<i>12</i>	<i>5,374</i>
	<i>4</i>	<i>955</i>	<i>8</i>	<i>819</i>	<i>12</i>	<i>1,774</i>
Black-tailed Prairie Dog	<i>1</i>	<i>72</i>			<i>1</i>	<i>72</i>
Designated Sensitive Species	<i>1</i>	<i>3</i>	<i>6</i>	<i>532</i>	<i>7</i>	<i>535</i>
Mule Deer Winter Range	<i>12</i>	<i>10,328</i>	<i>31</i>	<i>32,477</i>	<i>43</i>	<i>42,805</i>
Elk Winter Range	<i>9</i>	<i>6,779</i>	<i>22</i>	<i>23,323</i>	<i>31</i>	<i>30,102</i>
Antelope Winter Range	<i>9</i>	<i>3,804</i>	<i>14</i>	<i>7,039</i>	<i>23</i>	<i>10,843</i>
Bighorn Sheep Distribution	<i>4</i>	<i>3,080</i>	<i>13</i>	<i>11,164</i>	<i>17</i>	<i>14,244</i>
Bighorn Sheep Lambing	<i>4</i>	<i>1,059</i>	<i>11</i>	<i>5,504</i>	<i>15</i>	<i>6,563</i>
Streams & Riparian/Wetland Areas	<i>11</i>	<i>4,339</i>	<i>25</i>	<i>12,171</i>	<i>36</i>	<i>16,510</i>
Soils/Slopes						
20% & Severely Erodable	<i>10</i>	<i>2,373</i>	<i>30</i>	<i>10,687</i>	<i>40</i>	<i>13,060</i>
30%	<i>9</i>	<i>1,683</i>	<i>29</i>	<i>5,352</i>	<i>38</i>	<i>7,035</i>
40%	<i>8</i>	<i>753</i>	<i>25</i>	<i>2,399</i>	<i>33</i>	<i>3,152</i>
VRM Class						
Class I	<i>1</i>	<i>92</i>	<i>7</i>	<i>2,246</i>	<i>8</i>	<i>2,338</i>
Class II	<i>10</i>	<i>7,454</i>	<i>30</i>	<i>25,532</i>	<i>40</i>	<i>32,986</i>
Class III	<i>5</i>	<i>1,566</i>	<i>9</i>	<i>3,157</i>	<i>14</i>	<i>4,723</i>
Class IV	<i>7</i>	<i>1,216</i>	<i>7</i>	<i>1,542</i>	<i>14</i>	<i>2,758</i>

These acreage figures with slopes greater than 30% are incorporated in the acreage figure with slopes over 20% with severely erodable and slumping soils. The 10 affected West HiLine lease acreages lie within high and moderate potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 10,072 acres of the affected leases lie within the Monument and it may restrict enough activities on 3,394 acres to affect the ability of the operator to develop their lease based on this resource alone. For the 30 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 32,464 acres of the affected leases lie within the Monument and it may restrict enough activities on 13,060 acres to affect the ability of the operator to develop their lease based on this resource alone. None of the RFD Monument wells would be affected.

Visual Resources – A controlled surface use requirement would affect all the oil and gas leases (Table 4.25) by potentially delaying the operation 60 days or moving the operation 200 meters in order meet visual resource standards. Delaying the operation would likely not affect the ability of the operator to develop the resource; however, moving the operation 200 meters could cause the operator to locate the operation far enough away from a target to cause a difference between a dry hole and a producing gas well. The operator could use the option of directional drilling, but this could increase the cost of the operation to an extent that it may be unfeasible.

Seismic Operations – Seismic activity would be restricted to designated roads and exceptions would be authorized on a case-by-case basis. This alternative creates enough flexibility that operators would be able to conduct their seismic surveys. Operators would be allowed to gain access as long as they could demonstrate that the proposed survey would not interfere with sensitive wildlife areas. Allowing access to conduct seismic surveys would allow operators to procure better information which may yield better decisions about how to develop their leases. This may lead to a more efficient method of conducting exploration within the Monument and may lead to fewer roads and unnecessary wells drilled and more productive wells drilled.

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 21 wells 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 by having to locate a well on acceptable terrain. This may

require wells to be directionally drilled to minimize the surface disturbance. Industry would probably consider low impact drilling technology or multiple wells from one location. By requiring wells to potentially be directionally drilled the cost of the operation goes up and therefore this affects the ability of the operator to develop its resource and some wells may not get drilled due to economics.

Production Operations, 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.

This alternative would allow for restricted access (types of vehicles and timing) to monitor wells and facilities. There would be no impact to the ability to produce 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, including cross-country pipelines, would follow standard operating procedures (4th Edition, 2006 Gold Book). This could add some additional costs to producing the natural gas resource where the ability to cut across country would be limited and operations would be mostly limited to the access roads.

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 ability to produce the natural gas resource.

All current standards for oil and gas reclamation meet or exceed the reclamation requirements of this alternative. There would be no impact to the ability to produce the natural gas resource.

Alternative D

Conditions of Approval – The conditions of approval would affect a portion of the oil and gas leases in the Monument (Table 4.26).

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 or disruptive activities within 1/4 mile of prairie dog towns. This would affect 72 acres of one West HiLine lease. This acreage lies within an area containing high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 800 acres of the affected lease lie within the Monument and it is doubtful that restricting 72 acres of the total would affect the ability of the operator to develop their lease.

Designated Sensitive Species – A condition of approval would prohibit surface-disturbing or disruptive activities within identified habitat or within 1/4 mile of active nests. This would affect 3 acres of one West HiLine lease and 532 acres (2%) of six non-West HiLine leases. For the six affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 10,565 acres of the affected leases lie within the Monument and it is doubtful that restricting 532 acres of the total would affect the ability of the operator to develop their lease based on this resource alone. Other resource issues regarding these leases would likely be more restrictive than this resource by itself on the ability of the operator

to develop their lease. For the one West HiLine lease within the Monument, it is doubtful that 3 acres of the 1,416 acres would affect the ability of the operator to develop their lease.

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 2,117 acres (16%) of 9 non-West HiLine leases. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 212 open days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the 212 open days.

**Table 4.26
Oil and Gas Leases Affected by the Conditions of Approval – Alternative D**

<i>Stipulation/Condition of Approval</i>	<i>West HiLine Leases</i>		<i>Non-West HiLine Leases</i>		<i>All Leases</i>	
	<i>No.</i>	<i>Acres</i>	<i>No.</i>	<i>Acres</i>	<i>No.</i>	<i>Acres</i>
Greater Sage-Grouse						
Lek Nesting Area			1	31	1	31
Winter Habitat	5	1,291	7	4,083	12	5,374
	4	955	8	819	12	1,774
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
Mule Deer Winter Range	12	10,328	31	32,477	43	42,805
Elk Winter Range	9	6,779	22	23,323	31	30,102
Antelope Winter Range	9	3,804	14	7,039	23	10,843
Bighorn Sheep Distribution	4	3,080	13	11,164	17	14,244
Bighorn Sheep Lambing	4	3,192	11	10,358	15	13,550
Streams & Riparian/Wetland Areas	11	5,492	26	15,259	37	20,751
Soils/Slopes						
20% & Severely Erodable	10	2,373	30	10,687	40	13,060
30%	9	1,683	29	5,352	38	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

Bald Eagle – A condition of approval would prohibit surface-disturbing or disruptive activities within 1/2 mile of any nest that has been active within the last 7 years and within riparian nesting habitat. Currently, no known roosting or nesting sites are 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-disturbing or disruptive activities on identified winter ranges from December 1 to May 15. The timing restriction would affect 10,328 acres (100%) of 12 West HiLine leases in mule deer winter range, 6,779 acres (89%) of 9 West HiLine leases in elk winter range, and 3,804 acres (49%) of 9 West HiLine leases in antelope winter range. If the timing restriction is applied as a condition to the non-West HiLine leases, it would affect an additional 32,477 acres of 31 leases in mule deer winter range, 23,323 acres of 22 leases in elk winter range, and 7,039 acres of 9 leases in antelope winter range for a period of 166 days. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 199 open days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the 199 open days.

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

Bighorn Sheep Lambing Areas – Prohibiting surface-disturbing or disruptive activities within 1 mile of identified bighorn sheep lambing areas would affect 3,192 acres (81%) of 4 West HiLine leases and 10,358 acres (76%) of 12 non-West HiLine leases. For the 4 affected West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 3,941 acres of the affected leases lie within the Monument and restricting 3,192 acres of the total would affect the ability of the operator to develop their lease based on this resource alone. The 12 affected non-West HiLine leases within the Monument include 13,628 acres. Restricting 10,358 acres of the 13,628 acres would affect the ability of the operator to develop their lease. None of the RFD Monument wells would be affected.

Streams – Surface-disturbing activities would be prohibited within 1/4 mile of streams. This would affect 5,492 acres of 11 West HiLine leases and 15,259 acres of 26 non-West HiLine leases. The 11 affected West HiLine lease acreages lie within high and moderate potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 9,208 acres of the affected leases lie within the Monument and it may restrict enough activities on 5,492 acres that it could affect the ability of the operator to develop their lease based on this resource alone. For the 26 affected

non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 32,004 acres of the affected leases lie within the Monument and it may restrict enough activities on 15,259 acres to affect the ability of the operator to develop their lease based on this resource alone. Twenty-six of the RFD Monument wells would be affected.

Soils/Slopes – Surface-disturbing activities on slopes over 30% or on slopes over 20% with severely erodible and slumping soils would require an engineering and reclamation plan approved by an authorized officer. Surface-disturbing activities would be prohibited on slopes 40% and greater. This would affect 2,373 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 erodible and slumping soils. The 10 affected West HiLine lease acreages lie within high and moderate potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 10,072 acres of the affected leases lie within the Monument and it may restrict enough activities on 2,373 acres to affect the ability of the operator to develop their lease based on this resource alone. For the 30 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 32,464 acres of the affected leases lie within the Monument and it may restrict enough activities on 13,060 acres that it could affect the ability of the operator to develop their lease based on this resource alone. Three of the RFD Monument wells would be affected.

Visual Resources – Surface-disturbing activities may be prohibited in VRM Class I areas. This would affect 108 acres (6%) of 2 West HiLine lease and 2,828 acres (25%) 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. The two affected West HiLine lease acreages lie within moderate potential for gas occurrence and moderate potential for additional wells to be drilled; however, a total of 1,874 acres of the 2 affected leases lie within the Monument, and it is doubtful that restricting 108 acres of the total would affect the ability of the operator to develop their lease based on this resource alone. For the 10 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled.

A total of 11,445 acres of the affected leases lie within the Monument and it may restrict enough activities on

2,828 acres to affect the ability of the operator to develop their lease based on this resource alone. Four of the RFD Monument wells would be affected.

With respect to the controlled surface use requirement, the 10 affected West HiLine lease acreages lie within moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled; however, a total of 10,328 acres of the 10 affected leases lie within the Monument and it is possible that restricting 10,220 acres of the total may affect the ability of the operator to develop their lease based on this resource alone.

Acreage for the 31 affected non-West HiLine leases lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 32,477 acres of the affected leases lie within the Monument and it may restrict enough activities on the 29,649 acres to affect the ability of the operator to develop their lease based on this resource alone. None of the RFD Monument wells would be affected.

Seismic Operations – Seismic activity would be restricted to helicopter-supported seismic activities and would be required to remain on the existing road system. This would not restrict the industry’s ability to identify geologic features worthy of further exploration; however, it would drive up the cost of acquiring geophysical data, and due to cost of data acquisition this method of exploration could be foregone. This may cause more impact overall than necessary because allowing better access to conduct seismic surveys would allow operators to procure better information which may yield better decisions about how to develop the existing leases. This could lead to a more efficient method of conducting exploration within the Monument and may lead to fewer roads and unnecessary wells drilled and more productive wells drilled.

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). Four of the RFD wells would be affected based on well spacing.

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. By

requiring wells to potentially be directionally drilled the cost of the operation goes up, affecting the ability of the operator to develop its resource, and some wells may not get drilled due to economics.

Production Operations, 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 (4th Edition, 2006 Gold Book). This could cause an increase in costs of operations due to increased pipeline distances where the ability to construct line cross-country would be limited and operations would be mostly limited to the access roads.

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. Each requirement by itself would likely not impede the ability of the operator to produce their wells; however, combined together this could cause an increase to the costs of operations or potentially a reduction in production.

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. There would be no impact to the ability to produce the natural gas resource by being able to utilize remote data access through radio waves.

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 current standards for oil and gas reclamation meet or exceed the reclamation requirements of this alternative. There would be no impact to the ability to produce the natural gas resource.

Alternative E

Conditions of Approval – Surface-disturbing or disruptive activities 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 4.27).

Greater Sage-Grouse – A condition of approval would be attached to each APD which would prohibit surface-disturbing or disruptive activities within 2 miles of sage-grouse leks. This would affect 4,083 acres of 7 non-West HiLine leases (51%). This acreage lies within a high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 7,982 acres of the affected lease lie within the Monument and restricting 4,083 acres of the total would affect the ability of the operator to develop their lease. Twenty-one of the RFD Monument wells would be affected.

Designated Sensitive Species – A condition of approval would prohibit surface-disturbing activities within identified habitat or within 1/2 mile of active nests. This would affect 2,117 acres (16%) of 9 non-West HiLine leases. Acreage for the 9 affected non-West HiLine leases lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 13,511 acres of the affected leases lie within the Monument and it is doubtful that restricting 2,117 acres of the total would affect the ability of the operator to develop their lease based on this resource alone. However, the other combined resource restrictions within this alternative would deny the operator the ability to develop the 9 non-West HiLine leases. Six of the RFD Monument wells would be affected.

Big Game Winter Range – A condition of approval would prohibit surface-disturbing or disruptive activities on identified winter range. This would affect 32,477 acres of 31 leases in mule deer winter range, 23,323 acres of 22 leases in elk winter range, and 7,039 acres of 9 leases in antelope winter range. For the 31 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 32,477 acres of the affected leases lie within the Monument, and restricting this much acreage would affect the ability of the operator to develop their lease based on this resource alone. Thirty-nine of the RFD Monument wells would be affected.

Bighorn Sheep Distribution – A condition of approval would prohibit surface-disturbing or disruptive activities on identified bighorn sheep distribution. This would affect 11,164 acres (75%) of 13 non-West HiLine leases. The 13 affected non-West HiLine leases acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 14,866 acres of the affected leases lie within the Monument, and restricting 11,164 acres of the total would affect the ability of the operator to develop their lease based on this

resource alone. Twelve of the RFD Monument wells would be affected.

Bighorn Sheep Lambing Areas – Prohibiting surface-disturbing or disruptive activities within 1 mile of identified bighorn sheep lambing areas would affect 10,358 acres (76%) of 12 non-West HiLine leases. The 12 affected non-West HiLine leases within the Monument include 13,628 acres. Restricting 10,358 acres of the 13,628 acres would affect the ability of the operator to develop their lease. Twelve of the RFD Monument wells would be affected.

Streams – Surface-disturbing activities would be prohibited within 1/4 mile of streams. This would affect 15,259 acres of 26 non-West HiLine leases. For the 26 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 32,004 acres of the affected leases lie within the Monument and it may restrict enough activities on 15,259 acres to affect the ability of the operator to develop their lease based on this resource alone. Twenty-six of the RFD Monument wells would be affected.

Soils/Slope – Surface-disturbing activities would be prohibited on slopes over 20%. This would affect 11,616 acres of 30 non-West HiLine leases. Acreage for the 30 affected non-West HiLine leases lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 32,464 acres of the affected leases lie within the Monument and it may restrict enough activities on 11,616 acres to affect the ability of the operator to develop their lease based on this resource alone. Ten of the RFD Monument wells would be affected.

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). Forty-four of the RFD Monument wells would be affected.

Seismic Operations – Seismic activity would be restricted to helicopter supported seismic activities. 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. Operators may forego the future expense of conducting geophysical surveys in the Monument because no more drilling could occur.

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. There would be the potential for 18 wells within 1/2 mile of the Monument on federal minerals. 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 operators' ability to maintain secure and safe operations.

Production Operations, 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 (4th Edition, 2006 Gold Book). Increased pipeline distances may increase the costs of operations.

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 of the water via a pipeline, disposal pits (including tanks) or an approved 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 current standards for oil and gas reclamation meet or exceed the reclamation requirements of this alternative. There would be no impact to the ability to produce the natural gas resource.

Alternative E_{NL}

There would be no difference between Alternative E and Alternative E_{NL}, except for the potential of conducting geophysical work in areas adjacent to the Monument; there would be less oil and gas lease acreage in the Monument (10,328 acres). However, seismic operations could be permitted off lease on BLM land for the purpose of exploring state and private minerals or federal minerals adjacent to the Monument.

Alternative F (Preferred Alternative)

Conditions of Approval – The conditions of approval would affect a portion of the oil and gas leases in the Monument (Table 4.28).

Greater Sage-Grouse – A condition of approval would prohibit surface-disturbing or disruptive activities 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. This acreage lies within a high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 2,560 acres of the affected lease lie within the Monument and it is doubtful that restricting 31 acres of the total would affect the ability of the operator to develop their lease.

For nesting areas, the timing restriction from March 1 to June 15 would affect 1,291 acres of 5 West HiLine and 4,083 acres of 7 non-West HiLine oil and gas leases with a 107 day restriction. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 258 days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the same 258 open days of the year.

Table 4.27 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	7	4,083
Designated Sensitive Species	9	2,117
Mule Deer Winter Range	31	32,477
Elk Winter Range	22	23,323
Antelope Winter Range	14	7,039
Bighorn Sheep Distribution	13	11,164
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

For winter habitat, the timing restriction from December 1 to March 31 would affect 955 acres of 4 West HiLine oil and gas leases and 819 acres of 8 non-West HiLine leases with a 121-day restriction. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also allows 244 open days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the same 244 open days of the year.

Black-tailed Prairie Dogs – A condition of approval would prohibit adverse surface-disturbing or disruptive activities within 1/4 mile of prairie dog towns. This would affect 72 acres of one West HiLine lease. This acreage lies within an area containing high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 800 acres of the affected lease lie within the Monument and it is doubtful that restricting 72 acres would affect the ability of the operator to develop their lease.

Designated Sensitive Species – Surface-disturbing or disruptive activities may be controlled or excluded within 1/4 mile of the proposed activity, or the activity could be delayed 90 days. Surface-disturbing or disruptive activities 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. The affected West HiLine lease acreage lies within a high potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 1,416 acres of the affected lease lie within the Monument and it is doubtful that restricting 3 acres of the total would affect the ability of the operator to develop their lease based on this resource alone. Other resource issues regarding this lease, including steep slopes and bighorn sheep habitat, would likely be more restrictive than this resource by itself on the ability of the operator to develop their lease. For the 6 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 10,565 acres of the affected leases lie within the Monument and it is doubtful that restricting 532 acres of the total would affect the ability of the operator to develop their lease based on this resource alone. Other resource issues regarding these leases would likely be more restrictive than this resource by itself on the ability of the operator to develop their lease. None of the RFD Monument wells would be affected.

Bald Eagle – A condition of approval would prohibit surface-disturbing or disruptive activities within 1/2 mile of any nest that has been active within the last 7 years. Currently, no known roosting or nesting sites are 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 – A condition of approval would prohibit surface-disturbing or disruptive activities on identified winter ranges from December 1 to March 31. This timing restriction would affect 10,328 acres (100%) of 12 West HiLine leases in mule deer winter range, 6,779 acres (89%) of 9 West HiLine leases in elk winter range, and 3,804 acres (49%) of 9 West HiLine leases in antelope winter range. If this timing restriction is applied as a condition to the non-West HiLine leases, it would affect an additional 32,477 acres of 31 leases in mule deer winter range, 23,323 acres of 22 leases in elk winter range, and 7,039 acres of 9 leases in antelope winter range for a period of 121 days. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 244 open days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the 244 open days.

Bighorn Sheep Distribution – A condition of approval would prohibit surface-disturbing or disruptive activities in identified bighorn sheep distribution areas from December 1 to March 31. This timing restriction would affect 3,080 acres (78%) of 4 West HiLine leases and 11,164 acres (75%) of 13 non-West HiLine leases for a period of 121 days. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 244 open days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the 244 open days.

Bighorn Sheep Lambing Areas – A condition of approval would prohibit surface-disturbing or disruptive activities in identified bighorn sheep lambing areas from April 1 to June 15. This timing restriction would affect 1,059 acres (27%) of 4 West HiLine leases and 5,504 acres (50%) of 11 non-West HiLine leases for a period of 76 days. This would impede the ability of the operator as to the timeframe allowed to develop the lease; however, it also would allow 289 open days of the year for the operator to explore and develop their lease(s), provided there are no other timing restrictions over the same area during the 289 open days.

Streams – Surface-disturbing activities would be prohibited within 500 feet of stream channels. This would affect 2,303 acres of 10 West HiLine leases and 6,618 acres 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). The affected West HiLine lease acreage lies within high and moderate potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 9,128 acres of the affected lease lie within the Monument and it may restrict enough activities on 2,303 acres to affect the ability of the operator to develop their leases

based on this resource alone. For the 25 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 31,135 acres of the leases lie within the Monument and it may restrict enough activities on 6,618 acres to affect the ability of the operator to develop their leases based on this resource alone. Three RFD Monument wells would not be drilled.

Soils – Surface-disturbing activities on slopes over 30% or on slopes over 20% with severely erodable and slumping soils would require an engineering and reclamation plan approved by an authorized officer. Surface-disturbing activities would be prohibited on slopes 40% and greater. This would affect 2,373 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. The 10 affected West HiLine lease acreages lie within high and moderate potential for gas occurrence and high potential for additional wells to be drilled; however, a total of 10,072 acres of the affected leases lie within the Monument and it may restrict enough activities on 2,373 acres to affect the ability of the operator to develop their leases based on this resource alone. For the 30 affected non-West HiLine leases, the affected acreage lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 32,464 acres of the affected leases lie within the Monument and it may restrict enough activities on 10,687 acres to affect the ability of the operator to develop their leases based on this resource alone. Three of the RFD Monument wells would be affected.

**Table 4.28
Oil and Gas Leases Affected by the Conditions of Approval
Alternative F (Preferred Alternative)**

<i>Stipulation/Condition of Approval</i>	<i>West HiLine Leases</i>		<i>Non-West HiLine Leases</i>		<i>All Leases</i>	
	<i>No.</i>	<i>Acres</i>	<i>No.</i>	<i>Acres</i>	<i>No.</i>	<i>Acres</i>
Greater Sage-Grouse						
Lek Nesting Area			1	31	1	31
Winter Habitat	5	1,291	7	4,083	12	5,374
	4	955	8	819	12	1,774
Black-tailed Prairie Dog	1	72			1	72
Designated Sensitive Species	1	3	6	532	7	535
Mule Deer Winter Range	12	10,328	31	32,477	43	42,805
Elk Winter Range	9	6,779	22	23,323	31	30,102
Antelope Winter Range	9	3,804	14	7,039	23	10,843
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	2,373	30	10,687	40	13,060
30%	9	1,683	29	5,352	38	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	10	7,438	30	25,137	40	32,575
Class III	5	1,520	9	2,520	14	4,040
Class IV	7	1,262	8	1,992	15	3,254

Visual Resources – Surface-disturbing activities may be prohibited in VRM Class I areas. This alternative would affect 108 acres (6%) of 2 West HiLine leases and 2,828 acres (25%) 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. The two affected West HiLine lease acreages lie within moderate potential for gas occurrence and moderate potential for additional wells to be drilled; however, a total of 1,874 acres of the 2 affected leases lie within the Monument and it is doubtful that restricting 108 acres of the total would affect the ability of the operator to develop their lease based on this resource alone. Acreage for the 10 affected non-West HiLine leases lies within both moderate and high potential for gas occurrence and low, moderate and high potential for additional wells to be drilled. A total of 11,445 acres of the affected leases lie within the Monument and it may restrict enough activities on 2,828 acres to affect the ability of the operator to develop their lease based on this resource alone. Four of the RFD Monument wells would be affected.

Seismic Operations – Seismic activity would be restricted to helicopter-supported seismic activities and would be required to remain on the existing road system. This would not restrict the industry’s ability to identify geologic features worthy of further exploration; however, it could drive up the cost of acquiring geophysical data which could cause the operator to forego this method of exploration. This may cause more impact overall than necessary because allowing better access to conduct seismic surveys would allow operators to procure better information, which may yield better decisions about how to develop the existing leases. This could lead to a more efficient method of conducting exploration within the Monument and may lead to fewer roads and unnecessary wells drilled and more productive wells drilled.

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 21 wells within 1/2 mile of the Monument on federal minerals. By requiring wells to potentially be directionally drilled the cost of the operation goes up, affecting the ability of the operator to develop its resource. Some wells may not get drilled due to economics.

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 Operations, Facilities and Equipment – This alternative would increase the costs to mitigate

noise levels and abate emissions on gas compression facilities; however, it is believed the costs would not be severe enough to affect the ability of the operators to produce 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.

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 (4th Edition, 2006 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, but overall, there should be no impact to the ability to produce the natural gas resource.

All current standards for oil and gas reclamation meet or exceed the reclamation requirements of this alternative. There would be no impact to the ability to produce 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 – Oil and Gas

Each alternative provides for stipulations and/or conditions of approval to protect the objects in the Monument based on the Proclamation. Alternative A represents current management. 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) would allow natural gas development to continue, but at reduced levels from current management. Table O.1-2 in Appendix O displays the effects for each alternative by lease.

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 the Monument designation. Natural gas exploration and development would occur over most of the leased area due to accessibility and restrictions.

Thirty-five 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 in the area within the next 15 to 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 8.3 billion cubic feet (BCF) of gas to be produced; a 15% decrease from Alternative B. Twelve wells would not be allowed to be drilled because of resource restrictions.

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.

Forty-four 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 in the area within the next 15 to 20 years. Another 5 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. One well would not be allowed to be drilled because of resource restrictions.

Alternative C

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 under Alternative A.

Twenty-eight 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 5 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. Nineteen wells would not be allowed to be drilled because of resource restrictions.

Alternative D

This alternative would have 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.

Thirteen 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 in the area within the next 15 to 20 years. Another 5 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. Thirty-five wells would not be allowed to be drilled because of resource restrictions.

Alternative E

This alternative would be the most restrictive concerning production of natural gas.

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 to 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. Fifty wells would not be allowed to be drilled because of resource restrictions.

Alternative E_{NL}

The impacts would be the same as Alternative E.

Alternative F (Preferred Alternative)

The impacts on the production of the natural gas resource would be moderate. 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 under Alternatives A and B.

Thirty-four 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 in the area within the next 15 to 20 years. Another 5 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. Thirteen wells would not be allowed to be drilled because of resource restrictions.

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 enclosures would help maintain and improve riparian conditions for camping and other recreation activities.

Depending on facility location, solar pumps and fence enclosures 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 – There would be no fees charged in the Monument except for the fee at the James Kipp Recreation Area, which has been in place since 1997 and is used to help pay for maintenance of the area.

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 research findings may detract from the integrity of the Monument.

Recreation in Sensitive Wildlife Habitat – Horn hunting could result in the disturbance of wildlife on their winter range when they are in poor condition, impacting the health of the herds.

Camping on islands would disturb wildlife during critical brooding and nesting periods.

Interpretive Sites – Cultural and geological interpretation may occur, 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 26% of the total operational recreation budget allocated for management of the 149-mile UMNWSR in Fiscal Year 2006. 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.

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.

Allowing metal detector use without a permit could result in the disturbance and/or removal of cultural and historical properties with no record of potential value for research.

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 could result in disturbance of wildlife on their winter range when they are in poor condition, impacting the health of the herds.

Boaters would not be discouraged from camping on islands which would disturb wildlife during critical brooding and nesting periods, impacting reproductive success.

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 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. Authorization would be on a case-by-case basis, and may be denied if the impacts from activities were deemed unacceptable.

Visitors having the ability to use metal detectors in some areas without the restriction of a permit could result in the loss of cultural and historic artifacts without concern for their research value.

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 – Restricting horn collection during the winter would limit what many people enjoy doing as a recreation activity. However, the restriction would prevent disturbance of wildlife during the period of the year when they are in a weakened state with possible impacts to herd health.

Boaters would not be discouraged from camping on islands which would disturb wildlife during critical brooding and nesting periods impacting reproductive success.

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. Authorization would be on a case-by-case basis, and may be denied if impacts from activities are deemed unacceptable.

Visitors would have the ability to use metal detectors in some areas without a permit which could result in the loss of cultural and historic artifacts without concern for their research value.

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.

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 – Prohibiting large groups and even small quantity specimen collecting would protect resources but would eliminate the recreational and educational value of collecting small amounts of minerals and common invertebrates with little impact on the resource.

Recreation in Sensitive Wildlife Habitat – The elimination of horn hunting would protect wintering wildlife from disturbance but also preclude a very popular recreation activity.

Camping on islands would not be allowed which 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 – Spontaneity to participate in activities involving a metal detector would be eliminated with permit requirements, but regulation of where and what can be collected would protect resources.

Authorization for large events 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 over-harvesting in some areas.

Recreation in Sensitive Wildlife Habitat – The popular recreational activity of horn hunting would be unrestricted and unimpeded, which could have a negative impact on wintering wildlife. Restrictions would be considered if MFWP determines that horn hunting on public land is impacting wildlife on winter ranges.

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, therefore reducing the overall impact on the number of unavailable camp sites between April 1 and 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 to 23 the number of SRPs issued for commercial floating/boating on the Missouri River would reduce opportunities for additional commercial use. Between 2002 and 2004, nine additional commercial operators 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 8,956 registered boaters per year by 2016. 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, which has fewer boaters compared to the White Cliffs section, 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 activities with associated noise levels that are different in pitch and volume than other motorized craft. Their potential frequency and proximity to other boaters, coupled with high pitched noise levels, impacts the experience most other boaters wish to enjoy.

The noise, disturbance and overall intrusion on the natural and primitive setting of the river associated with the landing and takeoff of a seaplane is beyond what most people expect or consider acceptable and may impact the boating experience for many people.

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.

Disturbance from seaplane landings would be allowed only after the peak floating season when the noise, disturbance and overall intrusion on the natural and primitive setting of the river associated with the landing and takeoff of a seaplane would impact the fewest number of people.

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 (speeds high enough to create a wave). Impacts could include visual disturbance, waves generated by boats operated at plane speeds and noise and disturbance of PWC and floatplanes landing and taking off.

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. 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. Between 2002 and 2004, nine additional commercial operators 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 8,956 registered boaters per year by 2016. 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 including floatplanes landing and taking off.

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 including floatplanes landing and taking off.

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. Floaters coming through this section may be impacted by motorized craft going in both directions at plane speeds. Impacts could include visual disturbance, waves and

noise generated by boats and PWC operated at plane speed, and floatplanes landing and taking off.

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.

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 because over 75% of the increase in boat use is associated with boats accompanying operators.

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. 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 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.

Sunday, Monday and Tuesday are historically 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 purposely 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 campfires 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 3 – Recreation Classification – PWC and floatplanes would be allowed yearlong which may impact the river experience of non-motorized boaters.

River Mile 3 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, although 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 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. It would also extend the motorized restriction into archery season (until September 15). This would allow 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 would also decrease the opportunity for other archers who access public lands upstream of the Fred Robinson Bridge via motorboat. This alternative would provide an additional 5 days of motorboat use in May and June and extend 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. Impacts would be the same as Alternative C.

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. 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 campfires 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.

Floater 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 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. People living in the area who depend on tourism and commercial boating could be affected by the lack of opportunities for commercial permit growth and expansion on the river.

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. With the lack of Level 1 and 2 campsites there is the potential for increased primitive camping and associated vegetation trampling and waste management factors near the river and nearby area.

During the busiest portion of the season (June 15 to 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 campfires 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. 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 to 23 issued for the Missouri River would reduce opportunities for additional commercial use of the resource. Between 2002 and 2004, nine additional commercial operators 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. Since most increases in use are associated with commercial operators, 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 a restriction on the total number of visitors. Within the framework of required visitor use restrictions, boaters could access the river when and where they choose. Managing visitor use without limiting the number of visitors would require additional monitoring and management to ensure that the standards are not exceeded.

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 vegetation 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 to 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 campfires 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 3 – Recreation Classification – Personal watercraft and floatplanes would be allowed on this segment of the river but would be prohibited from river miles 3 to 149 (Fred Robinson Bridge).

Restricting personal watercraft and floatplanes to river miles 0 to 3 (Fort Benton downstream) would preclude the ability to experience the most scenic and primitive segments of the river on this type of craft. However, the three miles of river should be adequate for use of personal watercraft since historically PWC have rarely been seen on the 3 to 52 mile segment of the river. The only affect on seaplanes along the Missouri River is that landing on the river would be limited to emergencies and not allowed for casual use. Those few landings of seaplanes on the river which occurred in the past would now be prohibited from river mile 3, below Fort Benton, to the Fred Robinson Bridge, river mile 149. In summary, the river could be flown by straight float planes with no less or no more concern for personal safety than in the past. If there is a need to land on the river for safety or an emergency it would be available without penalty.

River Mile 3 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.

Potential conflicts with boaters from noise levels and visual impacts of PWC and seaplanes 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) from June 15 to September 15. This restriction would impact the time required to tour that section of the river. A quick down-and-back cruise for sightseeing or fishing would be prohibited.

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) from September 16 to June 14.

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 15 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 around 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.

From June 15 to September 15 downstream travel at no wake speed only would be allowed on Thursday through Saturday. Motorized watercraft would not be allowed Sunday through Wednesday. People preferring the solitude of a non-motorized river experience would have only four days of this type use and only during specific days of the week which limits travel planning options.

Motorized craft would have only three days during the week to use their motors, also limiting the options for trip planning. However, within the period of one week these restrictions do allow people wanting a motorized and/or non-motorized river experience to meet their needs. This option provides diverse recreation experiences to the most people while preserving the outstanding remarkable values of the river.

Non-motorized use would be limited to Sunday through Wednesday from June 15 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 and would be restricted to the shoulder seasons of use, prior to June 15 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 any day of the week until June 15. The restriction of no motorized use from Sunday through Wednesday would extend into the 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 would also decrease the opportunity for other archers who access public lands upstream of the Fred Robinson Bridge via motorboat during this time period.

Compared to Alternative A, which provides no non-motorized use, this alternative would provide non-motorized use four days a week through the period June 15 to September 15.

There would be no opportunities for the use of PWC or the landing of floatplanes in this section.

Administrative use of motorized watercraft would occur during the seasonal restrictions and could negatively impact the river experience, particularly for those people preferring non-motorized travel where visual and noise disturbance are limited. However, the benefits of safety for the public through river patrols and the establishment and monitoring of scientific work on the river are critical to sustainability of use on the river and protection of its unique values.

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 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), which would eliminate additional rock fire rings 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 in 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), which 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 in 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, which 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 – A management strategy to manage and monitor uplands special recreation permits would best meet the needs of the operator and general public seeking a quality recreation opportunity in the Monument. Changing use patterns and resource conditions require that visitor use data be collected and analyzed on a year-to-year basis and that data includes net client hunter use days and areas of use, as well as social conflicts. If a permittee's patterns of use change, and an authorized area is not used for three or more years, it may be necessary to decrease the number of BLM land acres in their SRP. Conversely, if use levels increase, and the potential for social conflicts remain low and other natural or cultural resources would not be impacted, an authorized outfitter would be able to add more guides or hunting use days to their operation

with approvals from the Montana Board of Outfitters and the BLM. This management approach would identify the necessary indicators to monitor outfitter conditions of approval, including the standards and stipulations that could require a change in operations. Such management actions are necessary to enhance visitor use opportunities and protect resource values.

Currently, the 12 uplands outfitters in the Monument are required to stay within their authorized areas. Limiting the number of commercial permittees (operators) would decrease the possibility of hunting conflicts with the general public. Guided big game hunting in the Monument could increase in desirable areas where some of the 12 authorized permits have historically overlapped, and extra guides could be hired by the operator in response to public demand for their services. However, the Montana Board of Outfitters regulates the amount of use (time) an outfitter is allowed to operate in a season, and Montana Fish, Wildlife and Parks limits sheep, elk, and antelope licenses to a specific number every season. This has the potential of impacting the operator's income because a maximum of 10% of the total number of permits are given to the non-resident applicants, who may use an outfitter's services.

The BLM would still accept new outfitter SRP applications for upland big game hunting, as well as commercial hiking, horseback riding, automobile tours, and other commercial activities other than big game hunting or river boating. Approval of these permits would be determined on a case-by-case basis. Guided hunting SRP approvals would be based upon increases or decreases in licenses for specific game species, hunting days or areas used or not used by currently authorized permittees, and the current demand for these services.

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 adjacent to local and collector roads and resource roads. (These would be

pullout sites with a fire ring.) 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 encouraged for dispersed camping (Level 4 opportunities). This could reduce the number of additional rock fire rings 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 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, 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 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, 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 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, 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 the frequency would be reduced.

Impacts to Recreation from Access and Transportation

Access

Alternative A (Current Management)

Access to public lands could improve, affording greater recreation 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 public access to BLM land could provide additional recreation opportunities.

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 public access to BLM land could provide recreation opportunities.

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

Public access to BLM land and associated recreation opportunities would remain at current levels.

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

Public access to BLM land and associated recreation opportunities would remain at current levels.

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 public access to BLM land could provide recreation opportunities.

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 98% of current BLM roads at some time during the year. Currently, 11% of the BLM roads are closed seasonally. This level of access benefits those 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. Opportunities to access backcountry airstrips via road would be available; however, the road to the Woodhawk airstrip would be open seasonally.

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 the primitive nature of the Monument.

Alternative B

Hunters and other visitors would have fewer opportunities to access state land when four roads (11 miles) are closed seasonally leading to state land. This

may displace hunters and other visitors and result in a more concentrated number of users on surrounding BLM land.

An additional 19 miles of road would be closed yearlong and 28 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. Opportunities to access the ten backcountry airstrips via road would be available; however, the roads to the Woodhawk and Ervin Ridge airstrips would only be open seasonally.

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 seasonally open roads (47 miles) 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 where monitoring indicates a need to enhance safety or prevent resource damage or visitor confusion would help ensure signing only areas with a 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 seven roads are closed seasonally (14 miles) and two roads are closed yearlong (1 miles) leading to state land. This may displace hunters and other visitors and result in more concentrated numbers of users on surrounding BLM land.

Access to 72% 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 Alternatives A and B. Opportunities to access most of the seven backcountry airstrips via road would be available; however, the road to the Woodhawk airstrip

would only be open seasonally and the road to the Ervin Ridge airstrip would be closed.

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 – Retrieval of a tagged big game animal would be allowed during designated specific hours on some seasonally open roads (44 miles). 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 where monitoring indicates a need to enhance safety or prevent resource damage or visitor confusion would help ensure that only areas with a critical need 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 seven roads are closed seasonally (12 miles) and eight roads are closed yearlong (10 miles) leading to state land. 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. Opportunities to access the six backcountry airstrips via road would be limited; the roads to the Black Butte North, Bullwhacker, and Knox Ridge airstrips would be open but the roads to the Cow Creek, Ervin Ridge, and Left Coulee airstrips would be closed.

Road System Criteria – Seasonal road closures to protect wildlife could restrict motorized vehicle access and motorized recreation opportunities.

Exceptions – Retrieval of a tagged big game animal would be allowed during designated specific hours on some seasonally open roads (14 miles). 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 monitoring indicates a need to enhance safety or prevent resource damage or visitor confusion would help ensure that only areas with a critical need 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 leading to state land are closed yearlong (56 miles). 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 around 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. 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 recreation 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 six roads are closed seasonally (13 miles) and eight roads are closed yearlong (8 miles) 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 49% of current roads year round 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. Opportunities to access the six backcountry airstrips via road would be available; however, the road to the Woodhawk airstrip would only be open seasonally.

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 to specific hours of use and some seasonally open roads (81 miles). Disruption of other hunters would be reduced with the 10:00 a.m. to 2:00 p.m. retrieval timeframe. 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 and hikers could create new tracks up to 50 feet to park along the side of roads. Additional tracks may also spur off the newly created tracks leaving a possible spider web of routes leading to parking and camping areas.

Signing – Adding signs only after monitoring indicates a need to enhance safety or prevent resource damage or visitor confusion would help 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, opportunities for aircraft to access the backcountry airstrips in 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, where and how they choose to do so.

Visitors would not be subjected to further recreation use fees than are 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 sizes 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 conflicts of use, 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 sizes 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 conflicts of use, 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 of use 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 of use 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, and how they choose to do so. Should visitation increase at the assumed level of 5% per year, additional use restrictions could be applied if standards and/or indicators are reached. 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 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, and how they choose to do so. Should visitation increase at the assumed level of 5% per year, additional use restrictions could be applied if standards and/or indicators are reached. 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. An allocation system would be initiated that may possibly reduce the freedom to access the UMNWSR and enjoy the many recreational opportunities.

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, and how they choose to do so. Should visitation increase at the assumed level of 5% per year, additional use restrictions could be applied if standards and/or indicators are reached. 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 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 Natural Gas Exploration and Development

Alternative A (Current Management)

There would be the potential to have an additional 10 miles of road associated with natural gas operations available for public motorized travel.

Alternative B

There would be the potential to have an additional 17 miles of road associated with natural gas operations available for public motorized travel.

Alternative C

There would be the potential to have an additional 12 miles of road associated with natural gas operations available for public motorized travel.

Alternative D

There would be the potential to have an additional 1/2 mile of road associated with natural gas operations available for public motorized travel.

Alternative E

There would be no additional miles of roads associated with natural gas operations available for public motorized travel.

Alternative F (Preferred Alternative)

There would be the potential to have an additional 11 miles of road associated with natural gas operations available for public motorized travel.

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.

There would be public motorized access for 171 miles (29% of the BLM road system open); landowner permission is not required for access to these BLM roads. Nine of these BLM roads provide motorized public access to state land.

Any new BLM resource roads developed to accommodate natural gas development would provide additional motorized access for the public to travel. There could be 10 additional access miles.

Motorized travel could be allowed on some of the 13 miles of closed BLM roads for individuals with disabilities. This alternative could provide 2% more mileage 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.

There would be public motorized access for 159 miles (28% of the BLM road system open); landowner permission is not required for access to these BLM roads.

Any new BLM resource roads developed to accommodate natural gas development would provide additional motorized access for the public to travel. There could be 17 additional access miles.

Motorized travel could be allowed on some of the 32 miles of closed BLM roads for individuals with disabilities. This alternative could provide 5% more mileage 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.

There would be public motorized access for 140 miles (26% of the BLM road system open); landowner permission is not required for access to these BLM roads.

General public motorized access along new natural gas roads would be allowed, except in the Ervin Ridge area. There could be 12 miles of new BLM resource roads available for motorized public travel.

Motorized travel could be allowed on some of the 71 miles of closed BLM roads for individuals with disabilities. This alternative could provide 12% more mileage access opportunities not granted to the general public.

Alternative D

The BLM would not attempt to acquire new or additional public access.

There would be public motorized access for 110 miles (33% of the BLM road system open); landowner permission is not required for access to these BLM roads.

Any new BLM resource roads associated with natural gas activities could potentially be open for motorized travel by the public. There could be 1/2 mile of additional access.

Motorized travel could be allowed on some of the 269 miles of closed BLM roads for individuals with disabilities. This alternative could provide 45% more mileage access opportunities not granted to the general public.

Alternative E

The BLM would not attempt to acquire new or additional public access.

There would be public motorized access for 69 miles (64% of the BLM road system open); landowner permission is not required for access to these BLM roads.

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. There would be no increase in access miles from this activity.

Motorized travel could be allowed on some of the 498 miles of closed BLM roads for individuals with

disabilities. This alternative could provide 82% more mileage 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 increase the miles of roads open or open seasonally and available for motorized public travel. There would be no impact to administrative motorized use.

There would be public motorized access for 124 miles (31% of the BLM road system open); landowner permission is not required for access to these BLM roads.

Any new BLM resource roads associated with natural gas activities could potentially be open for motorized travel by the public. There could be 11 additional access miles.

Motorized travel could be allowed on some of the 201 miles of closed BLM roads (segments of 341 individual roads) for individuals with disabilities. This alternative could provide 33% more mileage access opportunities not granted to the general public.

BLM Road System

Alternative A (Current Management)

All existing BLM roads to state land would be open for administrative use and public travel. There are about 80 miles of BLM roads providing motorized access to state land intermingled with the Monument. About 74 miles would be open yearlong and 6 miles would be open seasonally.

All existing BLM roads to private land would be open yearlong for administrative and private landowner use. Most of these roads would also be open to the public. There are 67 miles of BLM roads providing motorized access to private land intermingled with the Monument. About 64 miles would be open yearlong, 2 miles would be open seasonally, and less than 1 mile would be closed.

A total of 524 miles of BLM roads would be open yearlong for public motorized and mechanized travel (including portions of 609 individual BLM road segments). 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 and 6 WSAs, and provide access associated with dispersed motorized use.

Sixty-eight miles of BLM roads would be open seasonally under a limited designation to public motorized and mechanized travel. This would include portions of 111 individual BLM road segments.

There would be 13 miles of BLM roads closed yearlong to public motorized access. This would include 12 miles (portions of 43 resource road segments) within the Woodhawk and Two Calf watersheds to provide wildlife habitat security; and 1 mile (1 resource road) near the Gist historic homestead.

Road System Criteria – In the six WSAs, about 49 miles of vehicle ways would remain open to public motorized travel. In the Cow Creek ACEC about 8.8 miles of BLM roads would be open (0.5 miles would be closed). In the UMNWSR 65 miles of BLM roads would be open yearlong, 10 miles would be open seasonally, and 5 miles would be closed.

Road Classification and Maintenance – The 605 miles of BLM roads would remain in the three classification categories as shown in Table 4.29: 15 miles of collector roads, 34 miles of local roads, and 556 miles of resource roads of which most are two-track roads.

The existing BLM road system would remain in the four maintenance levels shown in Table 4.30.

Exceptions – There would be no impact to administrative motorized use by BLM, other federal agencies, state and county agencies, lessees and permittees on 13 miles of roads closed yearlong (portions of 44 BLM road segments). If a road segment provides access to a facility and becomes impassable, spot maintenance could be authorized on a case-by-case basis.

Table 4.29 BLM Road Classification Alternatives A (Current Management), C, D, and E

<i>Classification</i>	<i>Miles of Road</i>	<i>Number of Road Segments</i>	<i>Percent of Road System</i>
Collector	15	2	2%
Local	34	8	6%
Resource	556	754	92%
Total	605	764	100%

<i>Maintenance Level</i>	<i>Miles of BLM Road</i>	<i>Number of Roads and Classification</i>	<i>Percent of Road System</i>
Level 1	13 Miles	44 Resource Road Segments	2%
Level 2	518 Miles	699 Resource Road Segments	86%
Level 3	8 Miles 59 Miles	1 Collector Road (Knox Ridge) 4 Local Roads and 8 Resource Roads	11%
Level 4	7 Miles	1 Collector Road (Cow Island)	1%

Administrative cross-country motorized travel in the Monument would be allowed yearlong.

Big game retrieval would be allowed along most of the 67 miles of resource roads that would be seasonally open (limited). Big game retrieval would not be allowed along 13 miles of resource roads that would be closed yearlong. Game carts could not travel cross-country from the 49 miles of vehicle ways in the six WSAs to retrieve harvested wildlife during the hunting season.

Motorized vehicles traveling the BLM roads 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 be the case for 592 miles along 720 BLM road segments.

Alternative B

All existing BLM roads to state land would be open yearlong for administrative use and most of these roads would also be open to the public yearlong. There are 80 miles of BLM roads providing motorized access to state land intermingled with the Monument. About 69 miles would be open yearlong and 11 miles would be open seasonally.

All existing BLM roads to private land would be open yearlong for administrative and private landowner use. Most of these roads would also be open to the public. There are 67 miles of BLM roads providing motorized

access to private land intermingled with the Monument. About 55 miles would be open yearlong, 11 miles would be open seasonally, and less than 1 mile would be closed.

There would be 477 miles of BLM roads (79% of the current road system) open yearlong for motorized public travel, which would include 551 road segments. This would be a decrease of 47 miles of BLM roads available for public motorized use yearlong.

A total of 96 miles of BLM roads open seasonally for public motorized travel would include:

- 116 road segments
- 43 miles closed from 4/1-6/15 to protect bighorn sheep lambing areas
- 6 miles closed from 12/1-4/15 in big game winter range
- 47 miles closed from 9/1-12/1 for wildlife habitat security

This alternative would place an additional 28 miles under a seasonal restriction.

There would be 32 miles of BLM roads closed yearlong to motorized public travel.

- Includes 97 road segments
- An increase of 19 miles closed yearlong
- Portions of the roads could be designated for mechanized use (mountain bikes).

<i>Classification</i>	<i>Miles of Road</i>	<i>Number of Road Segments</i>	<i>Percent of Road System</i>
Collector	15	2	2%
Local	34	8	6%
Resource	556	754	92%
Total	605	764	100%

Table 4.32			
BLM Road Maintenance – Alternative B			
<i>Maintenance Level</i>	<i>Miles of BLM Road</i>	<i>Number of Roads and Classification</i>	<i>Percent of Road System</i>
Level 1	32 Miles	97 Resource Road Segments	5%
Level 2	499 Miles	646 Resource Road Segments	83%
Level 3	8 Miles 59 Miles	1 Collector Road (Knox Ridge) 4 Local Roads and 8 Resource Roads	11%
Level 4	7 Miles	1 Collector Road (Cow Island)	1%

Road System Criteria – Forty-two miles of vehicle ways would remain open to public motorized travel in the six WSAs. In the Cow Creek ACEC about 9.2 miles of BLM roads would be open (0.1 mile would be closed). In the UMNWSR 38 miles of BLM roads would be open yearlong, 31 miles would be open seasonally, and 10 miles would be closed.

Road Classification and Maintenance – The BLM roads would fall into the classification shown in Table 4.31 and the maintenance levels shown in Table 4.32. In terms of maintenance levels there would be 32 miles in Level 1, 499 miles in Level 2, and the mileage in Levels 3 and 4 would be the same as Alternative A.

Cattleguards would be installed as needed, along any of the 477 miles of BLM roads that would be open yearlong.

The 32 miles of closed BLM roads under maintenance Level 1 would be allowed to reclaim naturally.

Exceptions – There would be no impact to administrative motorized use on 32 miles of BLM roads closed 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.

Motorized vehicles traveling the BLM roads that are open yearlong or seasonally would be allowed to drive 300 feet off the roads to park and camp in the Monument. This would be the case for 573 miles along 667 BLM road segments.

Alternative C

All existing BLM roads to state land would be open yearlong for administrative use. Most of these roads would also be open to the public yearlong or seasonally. There are about 80 miles of BLM roads providing motorized access to state land intermingled with the

Monument. About 65 miles would be open yearlong, 14 miles would be open seasonally, and 1 mile would be closed.

All existing BLM roads to private land would be open yearlong for administrative and private landowner use. Most of these roads would also be open to the public. There are 67 miles of BLM roads providing motorized access to private land intermingled with the Monument. About 52 miles would be open yearlong, 11 miles would be open seasonally, and 4 miles would be closed.

There would be 439 miles of BLM roads open yearlong for public motorized and mechanized travel.

- Includes portions of 484 road segments
- 73% of the existing road system
- 95 fewer miles available than current management

The BLM roads open yearlong for public motorized use would decrease by 95 miles. This decrease includes 18 miles of vehicle ways in the WSAs. There would be 71 miles on 184 BLM road segments closed yearlong to motorized public travel. This would result in a lower density of BLM roads in the Monument.

Road System Criteria – Thirty-four miles of vehicle ways would remain open to public motorized travel in the six WSAs. In the Cow Creek ACEC about 8.2 miles of BLM roads would be open (1.1 mile would be closed). In the UMNWSR 36 miles of BLM roads would be open yearlong, 26 miles would be open seasonally, and 18 miles would be closed.

Temporary road closures could occur on any segment of BLM resource 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 4.29).

The BLM roads would fall into the maintenance levels shown in Table 4.33. In terms of maintenance levels there would be 71 miles in Level 1, 461 miles in

Level 2, and the mileage in Levels 3 and 4 would be the same as Alternative A.

Cattleguards would be installed as needed along any of the 439 miles of BLM roads that would be open yearlong.

The 71 miles of closed BLM roads either would be allowed to reclaim naturally or selected segments of these 184 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.

Exceptions – There would be no impact to administrative motorized use on 71 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 44 miles of seasonally open (limited) BLM resource roads. Fewer BLM roads would be available to retrieve harvested big game animals.

- Allowed between 10 a.m. and 2 p.m. and for 3 hours after sunset
- Allowed September 1 through November 30

Motorized vehicles traveling the BLM roads open yearlong or seasonally would be allowed to drive 150 feet off the road to park and camp in the Monument. This could occur along 534 miles (88% of the total BLM road system) of BLM roads.

Alternative D

All existing BLM roads to state land would be open yearlong for administrative use. Most of these roads

would also be open to the public yearlong or seasonally. There are about 80 miles of BLM roads providing motorized access to state land intermingled with the Monument. About 58 miles would be open yearlong, 12 miles would be open seasonally, and 10 miles would be closed.

All existing BLM roads to private land would be open yearlong for administrative and private landowner use. There are 67 miles of BLM roads providing motorized access to private land intermingled with the Monument. About 33 miles would be open yearlong, 6 miles would be open seasonally, and 28 miles would be closed.

There would be 292 miles of BLM roads open yearlong for public motorized travel.

- Includes 239 road segments
- 48% of the existing road network
- 232 fewer miles available for motorized public use yearlong

There would be 44 miles of BLM roads open seasonally to public motorized travel (40 road segments).

There would be 269 miles of BLM roads closed yearlong to motorized public travel. This would result in a lower density of BLM roads available for public travel.

- Includes 498 road segments
- 256 fewer miles available to motorized public use
- Includes 230 miles that either parallel an adjacent road or are spur (one-way) roads

Some of the 269 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).

Table 4.33
BLM Road Maintenance – Alternative C

<i>Maintenance Level</i>	<i>Miles of BLM Road</i>	<i>Number of Roads and Classification</i>	<i>Percent of Road System</i>
Level 1	71 Miles	184 Resource Road Segments	12%
Level 2	461 Miles	559 Resource Road Segments	76%
Level 3	8 Miles 59 Miles	1 Collector Road (Knox Ridge) 4 Local Roads and 8 Resource Roads	11%
Level 4	7 Miles	1 Collector Road (Cow Island)	1%

Road System Criteria – About 16 miles of vehicle ways would remain open to public motorized travel in the six WSAs. In the Cow Creek ACEC about 4.6 miles of BLM roads would be open (4.7 miles would be closed). In the UMNWSR 28 miles of BLM roads would be open yearlong, 11 miles would be open seasonally, and 40 miles would be closed.

Motorized public travel on 44 miles of BLM roads in wildlife habitat areas would be limited seasonally.

Temporary road closures could occur on any segment of BLM resource roads to help reduce the spread of invasive weeds. Temporary closures could also occur in any segment of the 34 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 4.29). The BLM roads would fall into the maintenance levels shown in Table 4.34. In terms of maintenance levels there would be 269 miles in Level 1, 263 miles in Level 2, and the mileage in Levels 3 and 4 would be the same as Alternative A.

Cattleguards could be installed as needed along any of the 292 miles of BLM roads that would be open yearlong.

The 269 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 269 miles of BLM roads closed yearlong. 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 need to comply with wildlife seasonal closures in effect for these wildlife habitat areas.

Big game retrieval would be allowed on 14 miles of seasonally open (limited) BLM roads. Fewer BLM roads would be available to retrieve harvested big game animals.

- Allowed between 10 a.m. and 2 p.m.
- Allowed September 1 through November 30

Motorized vehicles traveling the BLM roads 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 could occur along 336 miles of BLM roads.

Alternative E

All existing BLM roads to state land would be open yearlong for administrative use. Most of these roads would be closed to the public yearlong. There are about 80 miles of BLM roads providing motorized access to state land intermingled with the Monument. About 24 miles would be open yearlong and 56 miles would be closed.

All existing BLM roads to private land would be open yearlong for administrative and private landowner use. There are 67 miles of BLM roads providing motorized access to private land intermingled with the Monument. About 12 miles would be open yearlong, 2 miles would be open seasonally, and 53 miles would be closed to the public.

Table 4.34
BLM Road Maintenance – Alternative D

<i>Maintenance Level</i>	<i>Miles of BLM Road</i>	<i>Number of Roads and Classification</i>	<i>Percent of Road System</i>
Level 1	269 Miles	498 Resource Road Segments	45%
Level 2	263 Miles	245 Resource Road Segments	43%
Level 3	8 Miles 59 Miles	1 Collector Road (Knox Ridge) 4 Local Roads and 8 Resource Roads	11%
Level 4	7 Miles	1 Collector Road (Cow Island)	1%

There would be 103 miles of BLM roads open yearlong for public motorized travel.

- Involves 84 road segments
- 17% of the BLM road system
- Includes 2 collector roads (15 miles)
- Includes 4 local roads (34 miles)
- Includes 54 miles of resource roads
- A 421 mile reduction from current management

Four miles of BLM roads would be open seasonally for public motorized travel (4 road segments).

There would 498 miles of BLM roads (672 road segments) closed yearlong to motorized public travel. This would be an increase of 485 miles of closed roads from current management.

Some of the 498 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).

Road System Criteria – There would be no motorized public travel within the six WSAs. In the Cow Creek ACEC about 0.1 mile of BLM roads would be open (9.2 miles would be closed). In the UMNWSR 19 miles of BLM roads would be open yearlong, 2 miles would be open seasonally, and 58 miles would be closed.

Four miles of BLM roads would be open seasonally: 2 miles in big game winter range and 2 miles in bighorn sheep lambing areas.

Temporary road closures could occur on any segment of BLM resource roads and the 34 miles of 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 4.29). The BLM roads would fall into the maintenance levels shown in Table 4.35. In terms of maintenance levels there would be 498 miles in Level 1, 38 miles in Level 2, and the 69 miles in Levels 3 and 4 would be the same as Alternative A.

Cattleguards could be installed as needed along any of the 103 miles of BLM roads that are open yearlong.

The 498 miles of closed BLM roads in maintenance Level 1 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 498 miles of BLM roads closed yearlong to public motorized travel. 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 from the BLM to travel cross country.

Big game retrieval would not be allowed on the 4 miles of seasonally open (limited) roads.

Motorized vehicles traveling the BLM roads open yearlong or seasonally would not be allowed to pull off the shoulder of the road to park and camp in the Monument. This would impact 108 miles along 88 BLM road segments.

Table 4.35
BLM Road Maintenance – Alternative E

<i>Maintenance Level</i>	<i>Miles of BLM Road</i>	<i>Number of Roads and Classification</i>	<i>Percent of Road System</i>
Level 1	498 Miles	672 Resource Roads	83%
Level 2	38 Miles	71 Resource Roads	6%
Level 3	8 Miles 54 Miles	1 Collector Road (Knox Ridge) 4 Local Roads and 8 Resource Roads	10%
Level 4	7 Miles	1 Collector Road (Cow Island)	1%

Table 4.36			
BLM Road Classification – Alternative F (Preferred Alternative)			
<i>Classification</i>	<i>Miles of Road</i>	<i>Number of Road Segments</i>	<i>Percent of Road System</i>
Collector	21	4	3%
Local	41	11	7%
Resource	543	743	90%
Total	605	758	100%

Alternative F (Preferred Alternative)

All existing BLM roads to state land would be open yearlong for administrative use. Most of these roads would also be open to the public yearlong or seasonally. There are about 80 miles of BLM roads providing motorized access to state land intermingled with the Monument. About 59 miles would be open yearlong, 13 miles would be open seasonally, and 8 miles would be closed.

All BLM roads to private land would be open yearlong for administrative, private landowner, and public use with the exception of 2 BLM roads. There are 67 miles of BLM roads providing motorized access to private land intermingled with the Monument. About 65 miles would be open yearlong and 2 miles would be closed.

Motorized vehicle travel would occur on 293 miles of BLM roads open to public motorized or mechanized travel yearlong.

- Includes 263 road segments
- 48% of the BLM road system
- A reduction of 231 miles available for public motorized travel yearlong

Motorized vehicular or mechanized travel could also occur on another 111 miles of BLM roads open seasonally to protect Monument values. This would include 80 BLM road segments.

An estimated 201 miles of BLM roads would be closed to motorized and mechanized public travel throughout the year.

- Includes 415 road segments
- Would reduce by 188 miles the roads available for public motorized use
- Most of these closed roads are spur roads (135 miles) or parallel/redundant roads (47 miles).

Table 4.37			
BLM Road Maintenance – Alternative F (Preferred Alternative)			
<i>Maintenance Level</i>	<i>Miles of BLM Road</i>	<i>Number of Roads and Classification</i>	<i>Percent of Road System</i>
Level 1	201 Miles	415 Resource Road Segments	33%
Level 2	5 Miles 335 Miles	1 Local Road (Woodhawk Bottom) 324 Resource Road Segments	56%
Level 3	13 Miles 36 Miles 7 Miles	2 Collector Roads (Knox Ridge and Timber Ridge) 5 Local Roads (Bullwhacker, Middle Two Calf, Lower Two Calf, Wood Bottom and Woodhawk Trail) 2 Resource Roads (Spencer Cow Camp and Butch Camp)	10%
Level 4	8 Miles	2 Collector Roads (Cow Island and James Kipp Recreation Area)	1%

Portions of the 201 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 – About 24 miles of vehicle ways would remain open to public motorized travel in the six WSAs. In the Cow Creek ACEC about 3 miles of BLM roads would be open (6.3 miles would be closed). In the UMNWSR 33 miles of BLM roads would be open yearlong, 12 miles would be open seasonally, and 34 miles would be closed.

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 4.36 and the maintenance levels shown in Table 4.37. In terms of maintenance levels, there would be 201 miles in Level 1, 340 miles in Level 2, 56 miles in Level 3, and 8 miles in Level 4.

Cattleguards could be installed as needed along any of the 293 miles of BLM roads that would be open yearlong.

The 201 miles of closed BLM roads would either be allowed to reclaim naturally or selected segments of these 415 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 (201 miles). 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 81 miles of seasonally open (limited) BLM roads during the hunting season.

- Allowed from 10 a.m. to 2 p.m.
- Allowed from September 1 through November 30

Motorized vehicles traveling along the estimated 404 miles of BLM roads that are open yearlong or seasonally would be allowed to park within 50 feet of the road.

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 backcountry (primitive) grass landing strips located in the Monument (Table 2.40) would be available for public use throughout the year by small fixed wing aircraft, helicopters, hot air balloons or ultralights. No budgeted annual maintenance projects or safety work would be scheduled for the backcountry 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 (noise) associated with small fixed wing aircraft and helicopters landing and taking off would impact the solitude in that immediate area for a short duration.

Commercial use of the ten landing strips would require prior authorization.

Alternative B

The ten identified existing backcountry airstrips would remain open yearlong for public use by small fixed wing aircraft, helicopters, hot air balloons or ultralights. The ten backcountry landing strips would be authorized by BLM for use by small fixed aircraft.

The BLM could provide additional backcountry airstrips in the Monument if an environmental review and public demand indicates a need for that type of infrastructure.

Commercial use of the 10 backcountry airstrips would require prior authorization.

Alternative C

There would be three less landing strips. Of the remaining seven airstrips, only four would remain open yearlong (Cow Creek, Left Coulee, Bullwhacker, and Knox Ridge) for public use by small fixed wing aircraft, helicopters, hot air balloons or ultralights. The

remaining 3 airstrips (Black Butte North, Ervin Ridge, and Woodhawk) would be open seasonally.

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 three airstrips would be allowed to reclaim naturally.

Aircraft use could either be less or more concentrated as the result of three 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 surface-disturbing activity would be done by hand.

Commercial use of the seven backcountry airstrips would require prior authorization from BLM.

Alternative D

Six backcountry landing strips would be authorized for public use by small fixed wing aircraft, helicopters, hot air balloons and ultralights, and would be listed on the Montana Aeronautical Chart.

The Cow Creek and Knox Ridge backcountry airstrips would be open for aircraft use yearlong and four (Left Coulee, Bullwhacker, Black Butte North, and Ervin Ridge) would be open seasonally.

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. This could concentrate more aircraft use on the six remaining landing strips.

Commercial use of the six backcountry airstrips would require prior authorization from BLM.

Alternative E

No backcountry landing strips would be allowed in the Monument. All 10 existing backcountry airstrips would be closed. They would be marked with the international FAA closed symbol and allowed to reclaim naturally.

Commercial use opportunities on the 10 airstrips would not occur.

Alternative F (Preferred Alternative)

Six backcountry airstrips would be authorized for public use and listed on the Montana Aeronautical Chart.

The Cow Creek, Knox Ridge, Left Coulee, Bullwhacker, and Black Butte airstrips would be open yearlong for public use by small fixed wing aircraft, helicopters, hot air balloons or ultralights. The Woodhawk airstrip would be open seasonally.

The four remaining airstrips (Roadside, Log Cabin, Black Butte South, and Ervin Ridge on the north 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. The current number of landings would indicate very little change in traffic pattern of air flights and the amount of use (volume) attributed to small fixed wing aircraft.

Some of the six 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 reach BLM land in the east half of the Monument where road access is not readily available for public motorized travel.

Commercial use of the six backcountry airstrips would require prior authorization from BLM. 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 592 miles of BLM Roads (98% of the current transportation network) would remain open for motorized public travel yearlong (524 miles) or seasonally (68 miles). 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.

Thirteen miles of BLM roads would be closed to public motorized travel.

The road density or spatial landscape ratio for BLM roads in the Monument would remain the same. About 93% of the Monument is within 1 mile of an open BLM road (yearlong or seasonally) with 1.01 miles of BLM

road per square mile, and 70% of the Monument would be within 1/2 mile of an open BLM road.

Aircraft use on the 10 backcountry grass airstrips could increase.

Alternative B

There would be 47 fewer miles of BLM roads available for public motorized travel yearlong. This open category would account for 79% of the Monument transportation plan. The closed BLM roads would increase from 13 miles to 32 miles.

The number of roads within 1 mile of BLM land would remain about the same, as would the spatial landscape ratio. About 92% of the Monument would be within 1 mile of an open BLM road (yearlong or seasonally) with .98 miles of BLM road per square mile, and 69% of the Monument would be within 1/2 mile of an open BLM road.

The BLM would authorize public use of the 10 backcountry grass airstrips.

Alternative C

There would be 85 fewer miles of BLM roads available for motorized public travel yearlong. This open category would account for 72% of the Monument transportation plan. The closed BLM roads would increase from 13 miles to 71 miles.

About 89% of the Monument would be within 1 mile of an open BLM road (yearlong or seasonally) with .91 miles of BLM road per square mile, and 65% of the Monument would be within 1/2 mile of an open BLM road.

The BLM would allow public use of seven backcountry grass airstrips, a 30% decrease from the existing situation.

Alternative D

There would be 232 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 13 miles to 269 miles.

The number of roads within 1 mile of BLM land would decrease. About 77% of the Monument would be within 1 mile of an open BLM road (yearlong or seasonally) with .57 miles of BLM road per square mile, and 49% of the Monument would be within 1/2 mile of an open BLM road.

The BLM would allow the use and maintenance of six backcountry grass 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 421 fewer miles of BLM roads available for motorized public travel yearlong. This open category would account for 17% of the Monument transportation plan. The closed BLM roads would increase from 13 miles to 498 miles.

The number of roads within 1 mile of BLM land would decrease to its lowest level. About 29% of the Monument would be within 1 mile of an open BLM road (yearlong or seasonally) with .18 miles of BLM road per square mile, and 15% of the Monument would be within 1/2 mile of an open BLM road.

The 10 backcountry grass airstrips would be closed.

Alternative F (Preferred Alternative)

There would be 231 fewer miles of BLM roads available for motorized public travel yearlong. This open category would account for 49% of the Monument transportation plan. Conversely, 33% 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 592 miles to 404 miles that would be open to motorized vehicle traffic sometime during the year.

The spatial landscape ratio (the number of acres between BLM road systems) would increase accordingly with the decrease in the roads. About 86% of the Monument would be within 1 mile of an open BLM road (yearlong or seasonally) with .69 miles of BLM road per square mile and 58% of the Monument would be within 1/2 mile of an open BLM road.

The BLM would allow the recreational use by small fixed wing aircraft, helicopters, hot air balloons or ultralights, and would allow the maintenance of six backcountry grass airstrips. Five landing strips would be available for yearlong activity and one airstrip seasonally. Four backcountry airstrips would be closed permanently including the airstrip in the Ervin Ridge WSA. 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 that would be inaccessible to motorized vehicles. Some of the six open airstrips could be used as

trailheads for hiking trail systems to various segments of the Monument.

Fire Management

Impacts to Fire Management from Health of the Land and Fire

Prescribed Fire

Alternative A (Current Management)

Restrictions on surface-disturbing or disruptive activities in sage-grouse winter habitat (December 15-May 15) could limit the BLM's ability to carry out prescribed fire projects during the most advantageous time of year (late winter through early spring). This involves 12,000 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 would be 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 could impact prescribed fire activities by limiting the seasons of the prescribed burn, size of the burn areas and altering the shape and layout of the proposed burn areas.

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 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-disturbing or disruptive activities in big game winter range from December 1 to March 31 could adversely impact the use of prescribed fire to improve winter range. This involves about 362,000 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 could 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-disturbing or disruptive activities in big game winter range from December 1 to May 15 could affect the use of prescribed fire to improve winter range. This involves about 362,000 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-disturbing or disruptive activities 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 and wildland fire use in the North Monument, South Monument, and Wilderness Study Areas FMUs would be used to augment wildland fire in returning fire to its historic regime. Prescribed fire and wildland fire use 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-disturbing or disruptive activities in big game winter range from December 1 to March 31 could adversely impact the use of prescribed fire to improve winter range. This involves about 362,000 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 FMUs 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 number of fires or acres (Table 4.3).

Alternative B

Wildland fire numbers would remain similar to Alternative A, but could involve fewer acres. 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.
- The North Monument FMU could experience an estimated 50% increase in acres.
- The South Monument FMU could experience an estimated 40% increase in acres.

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 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. Fire suppression acreage figures would be similar to Alternative A.

Impacts to Fire Management 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.

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)

Large events or large groups, if permitted during the fire season, could increase the fire prevention workload.

Impacts to Fire Management 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 some of the safety concerns. Floatplane activity could cause airspace problems during emergency activities.

Alternative E

There would be no impact.

Alternative F (Preferred Alternative)

Closing airstrips during fire activity in the Monument would lessen some of the safety concerns. Floatplane activity could cause airspace problems during emergency activities.

Summary of Cumulative Impacts to Fire Management

Alternative A (Current Management)

Prescribed fire use would be limited in the Wild and Scenic River and Wilderness Study Area FMUs to those projects that protect public safety and resource values, and limited in the North Monument and South Monument FMUs to those projects that protect public safety and resource values or achieve resource objectives. There would be approximately 35,000 acres of possible projects.

No changes are anticipated from the historical average number of fires or acres.

Alternative B

Prescribed fire projects would depend on the ecological need to introduce fire. No prescribed fire would be used in the Wild and Scenic River, North Monument or South Monument FMUs. There could be approximately 30,000 acres of potential prescribed fire projects in the

Wilderness Study Areas FMU which would be limited to those projects that protect public safety and resource values or achieve resource objectives.

Alternative C

The emphasis for prescribed fire would be on reducing hazardous fuel buildup where wildland fire would threaten private and public structures and improvements. Potential prescribed fire projects could include 5,200 acres in the Wilderness Study Areas FMU; 6,600 acres in the North Monument FMU; and 8,200 acres in the South Monument FMU.

Alternative D

The emphasis for prescribed fire would be on reducing hazardous fuel buildup where wildland fire would threaten private and public structures and improvements. Potential prescribed fire projects could include 6,200 acres plus 45,000 acres of FRCC Class 2 and 3 in the Wilderness Study Areas FMU; 5,000 acres plus 100,000 acres of FRCC Class 2 and 3 in the North Monument FMU; and 20,000 acres plus 105,000 acres of FRCC Class 2 and 3 in the South Monument FMU.

Alternative E

Prescribed fire acres would be similar to Alternative D, minus the FRCC Class 2 and 3 acres. Prescribed fire use in the Wild and Scenic River FMU would be limited to those projects that protect public safety and resource values or achieve resource objectives. Fire management would emphasize a maximum return of fire on the landscape.

Alternative F (Preferred Alternative)

Prescribed fire acres would be similar to Alternative D, minus the FRCC Class 2 and 3 acres.

There would be no anticipated changes from the historical average number of fires or acres.

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, or 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 Management

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 unlikely during drought conditions. 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 a minimum tool approach 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

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)

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.

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.

Alternative B

This alternative would designate a VRM Class I rating for all the WSAs (74,650 acres). This would preserve the scenic quality of the WSAs.

Alternative C

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 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. 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)

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.

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, subject to the non-impairment standard and criteria.

Commercial motorized 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. An unlimited number of SRPs could be issued, subject to the non-impairment standard and criteria.

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, 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, subject to the non-impairment standard and criteria.

Alternative F (Preferred Alternative)

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, subject to the non-impairment standard and criteria.

Commercial auto tour operator permits, while not being limited at a specific number, would be restricted to two vehicles or less per day for each commercial permit on local, collector and some identified resource roads.

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 through activity level planning.

Impacts to Wilderness Study Areas from Natural Gas Exploration and Development

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

A portion of four lease parcels totaling 1,441 acres exists within the Ervin Ridge WSA. Most of the lease acreage for these four leases is outside of the WSA. Solitude and other opportunities for a wilderness experience would be lost if these leases are developed. Under Alternatives A, B, and C it is reasonably foreseeable one new natural gas well could be drilled on these leases within the WSA. Under Alternatives D, E, and F it is reasonably foreseeable no new natural gas wells would be drilled on these leases in the WSA due to the condition of approval for VRM Class I areas (no surface-disturbing activities).

Impacts to Wilderness Study Areas from Access and Transportation

BLM Road System

Alternative A (Current Management)

The use of designated vehicle ways in the WSAs would continue. There are about 51 miles of vehicle ways in the six WSAs; 48.5 miles would be open yearlong, 0.6 miles open seasonally, and 2 miles closed (Table 4.38). Six miles of vehicle ways have reclaimed naturally, resulting in a decreased potential for soil erosion and vegetation decline.

The use of game carts off road 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.

Table 4.38
Vehicle Ways in Wilderness Study Areas – Alternative A (Current Management)

<i>Miles</i>	<i>Stafford</i>	<i>Ervin Ridge</i>	<i>Cow Creek</i>	<i>Antelope Creek</i>	<i>Woodhawk</i>	<i>Dog Creek</i>	<i>Total Miles</i>
Open	2.2	4.4	24.2	11.7	0.7	5.3	48.5
Seasonal			0.6				0.6
Closed					2.0		2.0
Total	2.2	4.4	24.8	11.7	2.7	5.3	51.1

Table 4.39 Vehicle Ways in Wilderness Study Areas – Alternative B							
<i>Miles</i>	<i>Stafford</i>	<i>Ervin Ridge</i>	<i>Cow Creek</i>	<i>Antelope Creek</i>	<i>Woodhawk</i>	<i>Dog Creek</i>	<i>Total Miles</i>
Open	1.5	2.0	20.1	10.3	0.7	0.4	35.0
Seasonal		0.6		1.0		4.9	6.5
Closed	0.7	1.8	4.7	0.4	2.0		9.6
Total	2.2	4.4	24.8	11.7	2.7	5.3	51.1

Alternative B

The use of designated vehicle ways in the WSAs would continue, with 35 miles open yearlong, 6.5 miles open seasonally, and 9.6 miles closed (Table 4.39).

The use of game carts off road 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 use of designated vehicle ways in the WSAs would continue, with 31 miles open yearlong, 3.3 miles open seasonally, and 16.8 miles closed (Table 4.40). Closed vehicle ways would be allowed to reclaim naturally, consistent with VRM Class I designations, which could result in a decreased potential for soil erosion and vegetation decline. 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.

The use of game carts could be allowed on some identified closed vehicle ways.

Alternative D

The use of designated vehicle ways in the WSAs would continue, with 15.6 miles open yearlong and 35.5 miles closed (Table 4.41). Closing most 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.

The use of game carts could be allowed on some identified closed vehicle ways.

Alternative E

All vehicle ways would be closed. The closed vehicle ways would be allowed to reclaim naturally, consistent with VRM Class I designations, which could result in a decreased potential for soil erosion and vegetation decline. 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.

The use of game carts would be prohibited.

Table 4.40 Vehicle Ways in Wilderness Study Areas – Alternative C							
<i>Miles</i>	<i>Stafford</i>	<i>Ervin Ridge</i>	<i>Cow Creek</i>	<i>Antelope Creek</i>	<i>Woodhawk</i>	<i>Dog Creek</i>	<i>Total Miles</i>
Open	1.1	1.3	17.9	7.5	0.7	2.5	31.0
Seasonal		0.5				2.8	3.3
Closed	1.1	2.6	6.9	4.2	2.0		16.8
Total	2.2	4.4	24.8	11.7	2.7	5.3	51.1

Table 4.41 Vehicle Ways in Wilderness Study Areas – Alternative D							
<i>Miles</i>	<i>Stafford</i>	<i>Ervin Ridge</i>	<i>Cow Creek</i>	<i>Antelope Creek</i>	<i>Woodhawk</i>	<i>Dog Creek</i>	<i>Total Miles</i>
Open		0.2	11.5	3.2	0.7		15.6
Seasonal							
Closed	2.2	4.2	13.3	8.5	2.0	5.3	35.5
Total	2.2	4.4	24.8	11.7	2.7	5.3	51.1

Alternative F (Preferred Alternative)

The use of designated vehicle ways in the WSAs would continue, with 9.2 miles open yearlong, 14.6 miles open seasonally, and 27.3 miles closed (Table 4.42). Closed vehicle ways would be allowed to reclaim naturally, consistent with VRM Class I designations, which could result in a decreased potential for soil erosion and vegetation decline. 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.

The use of game carts could be allowed on some identified 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 for 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. This would enhance WSA values.

Alternative F (Preferred Alternative)

The Ervin Ridge airstrip would be closed. This would enhance the WSA values.

Table 4.42 Vehicle Ways in Wilderness Study Areas – Alternative F (Preferred Alternative)							
<i>Miles</i>	<i>Stafford</i>	<i>Ervin Ridge</i>	<i>Cow Creek</i>	<i>Antelope Creek</i>	<i>Woodhawk</i>	<i>Dog Creek</i>	<i>Total Miles</i>
Open			5.5	3.0	0.7		9.2
Seasonal			9.5	4.5	0.6		14.6
Closed	2.2	4.4	9.8	4.2	1.4	5.3	27.3
Total	2.2	4.4	24.8	11.7	2.7	5.3	51.1

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. The WSAs are currently in good condition, with some exceptions where vehicle and/or boating traffic has 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 most of the WSA vehicle ways would protect the sensitive vegetation and soil resources.

Alternative E

Closing all of the WSA vehicle ways would protect the sensitive vegetation and soil resources. 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 Conditions

Impacts to Social Conditions Common to All Alternatives

Some groups and individuals who give a high priority to resource protection may feel that riparian habitat would not be given enough protection under any alternative,

which could result in a decline in quality of life for these groups and individuals.

American Indians would be allowed to continue to gather plants for medicinal purposes and willows for sweat lodge construction, which would allow them to continue traditional practices in and around the Monument.

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. Individuals with disabilities could have opportunities for access on closed roads not granted to the general public which could enhance their quality of life.

Environmental Justice

During the course of this analysis, no alternative considered resulted in any identifiable disproportionate effects 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. Low income people do live in the study area but, aside from American Indians, they do not appear to be associated with any specific BLM resources or activities. Effects to American Indians are discussed in the Social Conditions sections below. The effects to American Indians are not considered to be disproportionate.

Impacts to Social Conditions from Health of the Land and Fire

Alternative A (Current Management)

Management for wildlife, fire, vegetation, livestock grazing and other activities would continue as it has under the State Director's Interim Guidance. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. The quality of life of the above groups and individuals could be enhanced because this alternative would meet their lifestyle needs.

Groups and individuals who give a high priority to resource protection would feel wildlife habitat would not be adequately protected. This could result in a decline in the quality of life for these groups and individuals.

American Indians indicated concerns for Monument resources such as wildlife, cultural, historic and aesthetic values. They could feel that these values/resources would not be adequately protected, which could result in a decline in their quality of life.

Most local residents would want wildland fires to be fought as aggressively as possible. This alternative allows 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

Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. Although some minor adjustments may be required for eight livestock operators, the quality of life of the above groups and individuals could be enhanced because this alternative would meet their lifestyle needs.

Wildlife mitigation measures would increase opportunities for watchable wildlife viewing, which could increase the quality of life for those who engage in this activity.

Groups and individuals who give a high priority to resource protection would feel wildlife habitat would not be adequately protected. This could result in a decline in the quality of life for these groups and individuals.

American Indians indicated concerns for Monument resources such as wildlife, cultural, historic and aesthetic values. They could feel that these values/resources would not be adequately protected, which could result in a decline in their quality of life.

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 would be acceptable to most local residents.

Resource reserve allotments would be established. If made available, these allotments could allow added livestock grazing management flexibility.

Alternative C

Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. Some minor adjustments may be required for eight livestock operators. The quality of life of the above groups and individuals may be affected depending upon their individual lifestyle needs.

Wildlife mitigation measures would increase opportunities for watchable wildlife viewing which could increase the quality of life for those who engage in this activity.

Some groups and individuals who give a high priority to resource protection may feel that wildlife habitat would be given enough protection, which could result in an increase in quality of life for these groups and individuals.

American Indians indicated concerns for Monument resources such as wildlife, cultural, historic and aesthetic values. They may feel that these values/resources would be adequately protected, which could result in an increase in their quality of life.

The social effects of wildland fire suppression would be similar to Alternative B, except in the WSAs wildland fires would not be as aggressively fought. This alternative allows for prescribed fire where wildland fire could threaten private and public structures, which could resolve concerns for ranchers and local residents.

Resource reserve allotments would be established. If made available, these allotments could allow added livestock grazing management flexibility.

Alternative D

Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. Some minor adjustments may be required for eight livestock operators. The quality of life of the above groups and individuals could decline because they feel this alternative places too much emphasis on wildlife and visual resources. Wildlife mitigation measures would increase opportunities for watchable wildlife viewing, which could increase the quality of life for those who engage in this activity.

Groups and individuals who give a high priority to resource protection would feel that wildlife habitat would be given enough protection, which could result in an increase in the quality of life for these groups and individuals.

American Indians indicated concerns for Monument resources such as wildlife, cultural, historic and aesthetic values. They would feel that these values/resources would be adequately protected, which could result in an increase in their quality of life.

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.

Resource reserve allotments would be established. If made available, these allotments could allow added livestock grazing management flexibility.

Alternative E

Groups and individuals who give a high priority to resource use, as well as ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. The quality of life of the above groups and individuals could decline because they may feel this alternative places too much emphasis on wildlife and other resources.

Wildlife mitigation measures would increase opportunities for watchable wildlife viewing, which could increase the quality of life for those who engage in this activity.

Groups and individuals who give a high priority to resource protection would feel that wildlife habitat would be given enough protection, which could result in an increase in quality of life for these groups and individuals. Some of these groups and individuals would prefer this alternative over all other alternatives.

American Indians indicated concerns for Monument resources such as wildlife, cultural, historic and aesthetic values. They would feel that these values/resources would be adequately protected, which could result in an increase in their quality of life.

Wildland fire would be fought least aggressively under this alternative. Fires 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)

Groups and individuals who give a high priority to resource use, as well as many ranchers and other local

residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. This alternative may hinder some work related to livestock grazing which would create a minor inconvenience for the eight affected livestock operators. The quality of life of the above groups and individuals may decline because they may feel this alternative places too much emphasis on wildlife, visual and other resources.

Wildlife mitigation measures would increase opportunities for watchable wildlife viewing, which could increase the quality of life for those who engage in this activity.

Some groups and individuals who give a high priority to resource protection may feel that wildlife habitat would be given enough protection, which could result in an increase in quality of life for these groups and individuals.

American Indians indicated concerns for Monument resources such as wildlife, cultural, historic and aesthetic values. They could feel that these values/resources would be adequately protected, which could result in an increase in their quality of life.

The social effects of wildland fire suppression and prescribed fire would be the same as Alternative D.

Resource reserve allotments would be established. If made available, these allotments could allow added livestock grazing management flexibility.

Impacts to Social Conditions from Visitor Use, Services and Infrastructure

Alternative A (Current Management)

Recreation management would continue as it has in the past. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. The quality of life of the above groups and individuals could be enhanced because this alternative would meet their lifestyle needs.

The removal or collecting of specimens (shed antlers, 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 quality of life of recreationists could occur if new issues could not be addressed.

River recreation would be a continuation of current management. Current issues identified during scoping such as the effects of large groups on the experience of other users, concerns about noise from motorboats, 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. Other issues such as concerns about the effects of potential increases in visitors would not be addressed.

A primitive, quiet experience is highly desired by many of the river recreationists and they greatly prefer a time on the river when motorboats are not present. This alternative would not address these concerns as there would be no time on the river when motorboats would not be allowed, which could result in a decline in the quality of life of these recreationists. On the other hand, some recreationists prefer that motorboats continue to be allowed for the following reasons: some people do not have the time or physical capability to paddle the river, and some feel there is not currently enough motorboat use for it to be a concern. The quality of life of these recreationists could be enhanced.

Upland recreation would be a continuation of current management. Many choices would remain available for upland recreation users. 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. 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.

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 of use between commercial and general public hunters.

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.

Groups and individuals who give a high priority to resource protection indicated that motorized travel on the river should be limited or prohibited. Some are particularly concerned about the noise associated with motorboats. They would feel this alternative would not

address this issue, which could result in a decline in their quality of life.

Some American Indians indicated a concern regarding aesthetic and noise intrusions at vision quest or fasting sites. Others indicated a concern that traditional activities such as building campfires would not be allowed to continue. Depending on the individual concern, different alternatives could enhance or diminish quality of life.

Alternative B

Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. The quality of life of the above groups and individuals could be enhanced because this alternative would meet their lifestyle needs.

The removal or collecting of specimens (shed antlers, 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 quality of life of recreationists could occur if new issues could not be addressed.

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.

A primitive, quiet experience is highly desired by many of the river recreationists and they greatly prefer a time on the river when motorboats are not present. This alternative would not address these concerns as there would be no time on the river when motorboats would not be allowed, which could result in a decline in the quality of life of these recreationists. On the other hand, some recreationists prefer that motorboats continue to be allowed for the following reasons: some people do not have the time or physical capability to paddle the river, and some feel there is not currently enough motorboat use for it to be a concern. The quality of life of these recreationists could be enhanced.

In the uplands, the effect of this alternative would be increased opportunities for wildlife watching, semi-primitive motorized activities, mountain biking, and walk-in hunting. However, conflicts of use 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. 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.

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.

Groups and individuals who give a high priority to resource protection indicated that motorized travel on the river should be limited or prohibited. Some are particularly concerned about the noise caused by motorboats. They would feel this alternative would not address this issue, which could result in a decline in their quality of life.

Some American Indians indicated concerns regarding aesthetic and noise intrusions at vision quest or fasting sites. Others indicated concerns that traditional activities such as building campfires would not be allowed to continue. Depending on the individual concern, different alternatives could enhance or diminish their quality of life.

Alternative C

Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. The quality of life of the above groups and individuals may be affected depending upon their individual lifestyle needs.

A primitive, quiet experience is highly desired by many of the river recreationists and they greatly prefer a time on the river when motorboats are not present. This alternative would not address these concerns as there would be no time on the river when motorboats would not be allowed, which could result in a decline in the quality of life of these recreationists. On the other hand, some recreationists prefer that motorboats continue to be

allowed for the following reasons: some people do not have the time or physical capability to paddle the river, and some feel there is not currently enough motorboat use for it to be a concern. The quality of life of these recreationists could be enhanced.

In the uplands, this alternative would increase opportunities for bighorn sheep wildlife watching, semi-primitive motorized activities, mountain biking and walk-in hunting. Although the number of SRPs for commercial hunting would be limited to current numbers, the unlimited numbers of guides could lead to increased conflicts of use 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. 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.

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.

Groups and individuals who give a high priority to resource protection indicated that motorized travel on the river should be limited or prohibited. Some are particularly concerned about the noise caused by motorboats. They would feel this alternative would not address this issue, which could result in a decline in their quality of life.

Some American Indians indicated concerns regarding aesthetic and noise intrusions at vision quest or fasting sites. Others indicated concerns that traditional activities such as building campfires would not be allowed to continue. Depending on the individual concern, different alternatives could enhance or diminish their quality of life.

Alternative D

Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. The quality of life of the above groups and individuals may be diminished even though the social and economic analyses predict little effect to local landowners and communities.

A primitive, quiet experience is highly desired by many of the river recreationists and they greatly prefer a time on the river when motorboats are not present. This alternative would address these concerns because no motorized use would be allowed on river miles 92.5 to 149 from June 15 through September 15. This would enhance the quality of life of these recreationists. On the other hand, some recreationists prefer that motorboats continue to be allowed for the following reasons: some people do not have the time or physical capability to paddle the river, and some feel there is not currently enough motorboat use for it to be a concern. Part of the river would still be available to these recreationists at all times.

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 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.

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.

Groups and individuals who give a high priority to resource protection indicated that motorized travel on the river should be limited or prohibited. Some are particularly concerned about the noise caused by motorboats. They may feel this alternative would address this issue, which could result in an increase in their quality of life.

Some American Indians indicated concerns regarding aesthetic and noise intrusions at vision quest or fasting sites. Others indicated concerns that traditional activities such as building campfires would not be allowed to continue. Depending on the individual concern, different alternatives could enhance or diminish their quality of life.

Alternative E

Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. The quality of life of the above groups and individuals would

be diminished because their lifestyle needs would not be met.

A primitive, quiet experience is highly desired by many of the river recreationists and they greatly prefer a time on the river when motorboats are not present. This alternative would address these concerns because no motorized use would be allowed at any time, thereby eliminating all conflicts with motorboats. This would enhance the quality of life of these recreationists. On the other hand, some recreationists prefer that motorboats continue to be allowed for the following reasons: some people do not have the time or physical capability to paddle the river, and some feel there is not currently enough motorboat use for it to be a concern. Motorized opportunities would be completely eliminated and the quality of life of these recreationists would decline because their lifestyle needs were not being met.

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.

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.

Groups and individuals who give a high priority to resource protection indicated that motorized travel on the river should be limited or prohibited. Some are particularly concerned about the noise caused by motorboats. They would feel this alternative would address this issue, which would result in an increase in their quality of life.

Some American Indians indicated concerns regarding aesthetic and noise intrusions at vision quest or fasting sites. Others indicated concerns that traditional activities such as building campfires would not be allowed to continue. Depending on the individual concern, different alternatives could enhance or diminish their quality of life.

Alternative F (Preferred Alternative)

Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. The quality of life of the above groups and individuals may be diminished even though the social and economic analyses predict little effect to local landowners and communities.

A primitive, quiet experience is highly desired by many of the river recreationists and they greatly prefer a time on the river when motorboats are not present. This alternative would address these concerns because no motorized use would be allowed on miles 92.5 to 149 on Sunday through Wednesday from June 15 through September 15, thereby eliminating all conflicts with motorboats during these times. This would enhance the quality of life of these recreationists. On the other hand, some recreationists prefer that motorboats continue to be allowed for the following reasons: some people do not have the time or physical capability to paddle the river, and some feel there is not currently enough motorboat use for it to be a concern. Motorized opportunities would be allowed on the rest of the river during these time, thereby allowing these recreationists motorized access to some part of the river year round.

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 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. 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. If the need arises, the BLM could identify specific designated closed roads as access for individuals with disabilities.

The BLM would strive to partner with gateway communities to provide visitor information, which could enhance relationships between the recreationists and residents.

Groups and individuals who give a high priority to resource protection indicated that motorized travel on the river should be limited or prohibited. Some are particularly concerned about the noise caused by motorboats. They may feel this alternative would address this issue, which could result in an increase in their quality of life.

Some American Indians indicated concerns regarding aesthetic and noise intrusions at vision quest or fasting

sites. Others indicated concerns that traditional activities such as building campfires would not be allowed to continue. Depending on the individual concern, different alternatives could enhance or diminish their quality of life.

Impacts to Social Conditions from Natural Gas Exploration and Development

Alternative A (Current Management)

Fifty-six wells are forecast under this alternative. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents indicate that natural gas development should be allowed because the economic development is needed and the monies that accrue to the counties help the local school systems and provide other public services. The quality of life of the above groups and individuals could be enhanced because this alternative would meet their lifestyle needs.

Groups and individuals who give a high priority to resource protection would feel not enough protection for wildlife and other resources would be provided by the natural gas lease stipulations. This could result in a decline in quality of life for these groups and individuals.

Recreationists, including hunters, seeking a primitive experience may be negatively affected by the presence of wells and associated operations due to sight and sound conflicts and administrative use of motorized vehicles. This could diminish their quality of life.

American Indians indicated concerns about natural gas development in the Monument. They may feel the level of development is too high, resulting in a decline in their quality of life.

Alternative B

Sixty-seven wells are forecast under this alternative. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents indicate that natural gas development should be allowed because the economic development is needed and the monies that accrue to the counties help the local school systems and provide other public services. The quality of life of the above groups and individuals could be enhanced because this alternative would meet their lifestyle needs.

Groups and individuals who give a high priority to resource protection would feel not enough protection for wildlife and other resources would be provided by the natural gas lease stipulations. This could result in a decline in quality of life for these groups and individuals.

Recreationists, including hunters, seeking a primitive experience may be negatively affected by the presence of wells and associated operations due to sight and sound conflicts and administrative use of motorized vehicles. This could diminish their quality of life.

American Indians indicated concerns about natural gas development in the Monument. They may feel the level of development is too high, resulting in a decline in their quality of life.

Alternative C

Forty-nine wells are forecast under this alternative. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents indicate that natural gas development should be allowed because the economic development is needed and the monies that accrue to the counties help the local school systems and provide other public services. The quality of life of these groups and individuals may be affected by this alternative depending on their individual lifestyle needs.

Groups and individuals who give a high priority to resource protection would feel not enough protection for wildlife and other resources would be given by the natural gas lease stipulations. This could result in a decline in quality of life for these groups and individuals.

Recreationists, including hunters, seeking a primitive experience may be negatively affected by the presence of wells and associated operations due to sight and sound conflicts and administrative use of motorized vehicles. This could diminish their quality of life.

American Indians indicated concerns about natural gas development in the Monument. They may feel the level of development is too high, resulting in a decline in their quality of life.

Alternative D

Thirty-three wells are forecast under this alternative. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents indicate that natural gas development should be allowed because the economic development is needed and the monies that accrue to the counties help the local school systems and provide other public services. These groups and individuals may feel their lifestyle needs are not met by this alternative because of restrictions on oil and gas development.

During scoping, the BLM received many comments that would indicate that groups and individuals who give a high priority to resource protection could feel enough protection for wildlife and other resources would be given by the natural gas lease stipulations. This could

result in an increase in quality of life for these groups and individuals.

Recreationists, including hunters, seeking a primitive experience may be negatively affected by the presence of wells and associated operations due to sight and sound conflicts and administrative use of motorized vehicles. This could diminish their quality of life.

Some American Indians indicated concerns about development in the Monument. They may feel the level of natural gas development is at an acceptable level, which could enhance their quality of life.

Alternative E

Eighteen wells are forecast under this alternative. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents indicate that natural gas development should be allowed because the economic development is needed and the monies that accrue to the counties help the local school systems and provide other public services. The lifestyle needs of these groups and individuals would not be met by this alternative because of restrictions on oil and gas development; they would favor this alternative the least of all the alternatives.

Groups and individuals who give a high priority to resource protection would feel enough protection for wildlife and other resources would be given. This would result in an increase in quality of life for these groups and individuals.

The types of effects to primitive recreationists would be similar to the other alternatives, but the frequency would be lowest of any alternative.

American Indians indicated concerns about development in the Monument. No wells would be drilled, which may result in an increase in their quality of life.

Alternative F (Preferred Alternative)

Fifty-five wells are forecast under this alternative. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents indicate that natural gas development should be allowed because the economic development is needed and the monies that accrue to the counties help the local school systems and provide other public services. The quality of life of the above groups and individuals could be enhanced because this alternative would meet their lifestyle needs.

Groups and individuals who give a high priority to resource protection could feel enough protection for wildlife and other resources would be given by the natural gas lease stipulations. This could result in an

increase in quality of life for these groups and individuals.

Recreationists, including hunters, seeking a primitive experience may be negatively affected by the presence of wells and associated operations due to sight and sound conflicts and administrative use of motorized vehicles. This could diminish their quality of life.

American Indians indicated concerns about natural gas development in the Monument. They may feel the level of development is too high, resulting in a decline in their quality of life.

Impacts to Social Conditions from Access and Transportation

Alternative A (Current Management)

The BLM would pursue new public access easements in the Monument with willing landowners, which could increase the miles of roads open yearlong or seasonally. The public would retain their options to travel on existing BLM roads and to use all the airstrips within the Monument. Many people, such as ranchers and residents of local communities, have indicated this is very important to them because they use these roads for family recreation (hunting, fishing, picnicking, sightseeing, etc.), and to reduce the time needed to travel from one place to another in the sparsely settled area in and around the Monument.

Groups and individuals who give a high priority to resource use also feel that all roads and airstrips should be open. The quality of life of all the above groups and individuals could be enhanced because this alternative would meet their lifestyle needs.

Recreationists would have more access to the Monument which would enhance the experience for some and diminish it for others, depending upon the preferences of the individual. Hunters who prefer a walk-in experience and others who prefer a more primitive, non-motorized experience may find this difficult to achieve, which could diminish their quality of life.

Some recreationists who prefer motorized activities are very concerned about road closures, and subsequent loss of opportunities, on public lands. These individuals would prefer this alternative and it could enhance their quality of life because the opportunities they prefer would remain available.

All 10 existing airstrips would remain open; and additional airstrips could be allowed after environmental review. People who use these airstrips for recreation, livestock monitoring or other purposes would feel their options maintained and/or enhanced. For example, ranchers indicated they do some cattle surveillance by

plane and want the airstrips to remain available for that reason.

Groups and individuals who give a high priority to resource protection indicated that roads and airstrips should be limited in the Monument. They would feel this alternative would not offer enough protection to Monument resources which could result in a decline in their quality of life.

Some American Indians indicated concerns regarding the large number of roads and airstrips in the Monument that could cause aesthetic, noise, and light intrusions at vision quest or fasting sites. Others indicated concerns about continued access to areas in the Monument that are important to them. Depending on the individual concern, this alternative could enhance or diminish their quality of life.

Alternative B

The BLM would pursue new public access easements in the Monument with willing landowners, which could increase the miles of road open yearlong or seasonally. The public would retain their options to travel on most existing BLM roads and to use all the airstrips within the Monument. Many people, such as ranchers and residents of local communities, have indicated keeping roads open is very important to them because they use these roads for family recreation (hunting, fishing, picnicking, sightseeing, etc.), and to reduce the time needed to travel from one place to another in the sparsely settled area in and around the Monument.

Groups and individuals who give a high priority to resource use also feel that all roads and airstrips should be open. Ranchers indicated they do some cattle surveillance by plane and want the airstrips to remain available for that reason. The quality of life of all the above groups and individuals could be enhanced because this alternative would meet their lifestyle needs because most roads and all the airstrips would remain open.

Recreationists would have more access to portions of the Monument which would enhance the experience for some and diminish it for others, depending upon the preferences of the individual. Hunters who prefer a walk-in experience and others who prefer a more primitive, non-motorized experience may find this difficult to achieve, which could diminish their quality of life.

Some recreationists who prefer motorized activities are very concerned about road closures, and subsequent loss of opportunities, on public lands. These individuals would favor this alternative or Alternative A, and it would enhance their quality of life because the opportunities they prefer would remain available.

Some closed roads could be designated for mechanized use such as mountain bikes; 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 for recreation, livestock monitoring or other purposes would feel their options maintained and/or enhanced.

Groups and individuals who give a high priority to resource protection indicated that roads and airstrips should be limited in the Monument. They would feel this alternative would not offer enough protection to Monument resources which could result in a decline in their quality of life.

Some American Indians indicated concerns regarding the large number of roads and airstrips in the Monument that could cause aesthetic, noise, and light intrusions at vision quest or fasting sites. Others indicated concerns about continued access to areas in the Monument that are important to them. Depending on the individual concern, different alternatives could enhance or diminish their quality of life.

Alternative C

The BLM would pursue new public access easements in the Monument with willing landowners, which could provide additional road access year around or seasonally. The public would retain their options to travel on many existing BLM roads and to use some of the airstrips within the Monument. Many people, such as ranchers and residents of local communities, have indicated keeping roads open is very important to them because they use these roads for family recreation (hunting, fishing, picnicking, sightseeing, etc.), and to reduce the time needed to travel from one place to another in the sparsely settled area in and around the Monument. Ranchers also indicate they do some cattle surveillance by plane and want the airstrips to remain available for that reason. Groups and individuals who give a high priority to resource use also feel that all roads and airstrips should be open.

People who use roads closed under this alternative for activities other than lease maintenance would lose the option to use some roads they previously had available to them. The quality of life of groups and individuals who lose access to areas important to them could be diminished because this alternative would not meet their lifestyle needs.

Recreationists would have less access to portions of the monument which could enhance the experience for some and diminish it for others, depending upon the preferences of the individual. Hunters who prefer a walk-in experience and others who prefer a more primitive, non-motorized experience could find this easier to obtain than under Alternatives A or B, which could enhance their quality of life.

Some recreationists who prefer motorized activities are very concerned about road closures, and subsequent loss of opportunities, on public lands. These individuals would favor Alternatives A or B rather than Alternative C. Alternative C would diminish their quality of life because the opportunities they prefer would not be as available.

Some closed roads could be designated for mechanized use such as mountain bikes; the BLM would attempt to acquire access where no 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 three of these airstrips would be seasonally restricted. People who use these airstrips for recreation, livestock monitoring or other purposes may feel the loss of some options they previously enjoyed.

Groups and individuals who give a high priority to resource protection indicated that roads and airstrips should be limited in the Monument. They would feel this alternative would not offer enough protection to Monument resources which could result in a decline in their quality of life.

Some American Indians indicated concerns regarding the large number of roads and airstrips in the Monument that could cause aesthetic, noise, and light intrusions at vision quest or fasting sites. Others indicated concerns about continued access to areas in the Monument that are important to them. Depending on the individual concern, different alternatives could enhance or diminish their quality of life.

Alternative D

More roads would be closed than under Alternatives A, B and C. The public would retain their option to travel on about 60% of the existing BLM roads and to use some of the airstrips within the Monument. Many people, such as ranchers and residents of local

communities, have indicated keeping roads open is very important to them because they use these roads for family recreation (hunting, fishing, picnicking, sightseeing, etc.), and to reduce the time needed to travel from one place to another in the sparsely settled area in and around the Monument. Ranchers also indicate they do some cattle surveillance by plane and want the airstrips to remain available for that reason. Groups and individuals who give a high priority to resource use also feel that all roads and airstrips should be open. People who use roads closed under this alternative for activities other than lease maintenance would lose the option to use many roads they previously had available to them. The quality of life of groups and individuals who desire greater access within the Monument would be diminished because this alternative would not meet their lifestyle needs.

Recreationists would have less access to portions of the Monument which could enhance the experience for some and diminish it for others, depending upon the preferences of the individual. Hunters who prefer a walk-in experience and others who prefer a more primitive, non-motorized experience could find this would enhance their quality of life.

Some recreationists who prefer motorized activities are very concerned about road closures, and subsequent loss of opportunities, on public lands. This alternative would diminish their quality of life because the opportunities they prefer would be greatly restricted.

The BLM would not attempt to acquire new or additional public access. 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, big game retrieval would be allowed between 10 a.m. and 2 p.m. on some roads. 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 some recreationists could be substantially limited, which could result in a decline in affected recreationists' quality of life.

Because no new access would be pursued in places where access is not available or is inadequate, some people would continue to express concerns that only commercial hunting outfitters or those with private land access could access certain parts of the Monument.

Six of the 10 existing backcountry airstrips could remain open. Four of these airstrips would be restricted seasonally. People who use these airstrips for recreation, livestock monitoring or other purposes may feel the loss of many options they previously enjoyed.

Groups and individuals who give a high priority to resource protection indicated that roads and airstrips should be limited in the Monument. They could feel this

alternative would offer enough protection to Monument resources which could result in an increase in their quality of life.

Some American Indians indicated concerns regarding the large number of roads and airstrips in the Monument that could cause aesthetic, noise, and light intrusions at vision quest or fasting sites. Others indicated concerns about continued access to areas in the Monument that are important to them. Depending on the individual concern, different alternatives could enhance or diminish their quality of life.

Alternative E

This is the most restrictive alternative in terms of what would be allowed, and some people would feel their options to be severely limited.

More roads would be closed than under any other alternative. The public would retain their option to travel on about 20% of the existing BLM roads. No backcountry airstrips would remain open. Many people, such as ranchers and residents of local communities, have indicated keeping roads open is very important to them because they use these roads for family recreation (hunting, fishing, picnicking, sightseeing, etc.), and to reduce the time needed to travel from one place to another in the sparsely settled area in and around the Monument. Ranchers also indicate they do some cattle surveillance by plane and want the airstrips to remain available for that reason. Groups and individuals who give a high priority to resource use also feel that all roads and airstrips should be open. People who use roads closed under this alternative for activities other than lease maintenance would lose the option to use most roads they previously had available to them. The quality of life of groups and individuals who desire greater access within the Monument would be greatly diminished because this alternative would not meet their lifestyle needs.

Recreationists would have much less access to portions of the Monument which could enhance the experience for some and diminish it for others, depending upon the preferences of the individual. Hunters who prefer a walk-in experience and others who prefer a more primitive, non-motorized experience could find this much easier to obtain than under the other alternatives, which could enhance their quality of life.

Some recreationists who prefer motorized activities are very concerned about road closures, and subsequent loss of opportunities, on public lands. This alternative would diminish their quality of life because the opportunities they prefer would be greatly restricted.

The BLM would not attempt to acquire new or additional public access. Big game retrieval would not be allowed

on closed roads, some roads could be limited to specific motorized and/or mechanized use, and no off-road camping would be allowed. Some recreationists and hunters, particularly the aging public, could have their activities severely restricted, which could result in a decline in their quality of life. The BLM could designate specific closed roads for use by individuals with disabilities, based on demand or on a case-by-case basis.

Because no new access would be pursued in places where access is not available or is inadequate, some people would continue to express concerns that only commercial hunting outfitters or those with private land access could access certain parts of the Monument.

No backcountry airstrips would remain open and those who use these airstrips for recreation, livestock monitoring or other purposes would have all their options eliminated in this area.

Groups and individuals who give a high priority to resource protection indicated that roads and airstrips should be limited in the Monument. They would feel this alternative would offer enough protection to Monument resources which would result in an increase in their quality of life.

Some American Indians indicated concerns regarding the large number of roads and airstrips in the Monument that could cause aesthetic, noise, and light intrusions at vision quest or fasting sites. Others indicated concerns about continued access to areas in the Monument that are important to them. Depending on the individual concern, different alternatives could enhance or diminish their quality of life.

Alternative F (Preferred Alternative)

The public would retain their option to travel on about 70% of the existing BLM roads and to use some of the airstrips within the Monument. Many people, such as ranchers and residents of local communities, have indicated keeping roads open is very important to them because they use these roads for family recreation (hunting, fishing, picnicking, sightseeing, etc.), and to reduce the time needed to travel from one place to another in the sparsely settled area in and around the Monument. Ranchers also indicate they do some cattle surveillance by plane and want the airstrips to remain available for that reason. Groups and individuals who give a high priority to resource use also feel that all roads and airstrips should be open. People who use roads closed under this alternative for activities other than lease maintenance would lose the option to use many roads they previously had available to them. The quality of life of groups and individuals who desire greater access within the Monument would be diminished because this alternative would not meet their lifestyle needs.

The BLM would coordinate with federal and state agencies and county governments to improve public access to BLM land. This is very important to some people who desire more public access.

Recreationists would have less access to portions of the Monument which could enhance the experience for some and diminish it for others, depending upon the preferences of the individual. Hunters who prefer a walk-in experience and others who prefer a more primitive, non-motorized experience could find this much easier to obtain, which could enhance their quality of life.

Some closed roads could be designated for mechanized use such as mountain bikes; motorized or mechanized vehicles would be allowed to pull off 50 feet (outside wilderness study areas) to park; 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.

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. If the need arises, the BLM could identify specific designated closed roads as access for individuals with disabilities.

Six of the 10 existing backcountry airstrips would remain open. One of these airstrips would be restricted seasonally. People who use these airstrips for recreation, livestock monitoring or other purposes, may feel the loss of many options they previously enjoyed.

Groups and individuals who give a high priority to resource protection indicated that roads and airstrips should be limited in the Monument. They could feel this alternative would offer enough protection to Monument resources which could result in an increase in their quality of life.

Some American Indians indicated concerns regarding the large number of roads and airstrips in the Monument that could cause aesthetic, noise, and light intrusions at vision quest or fasting sites. Others indicated concerns about continued access to areas in the Monument that are important to them. Depending on the individual concern, different alternatives could enhance or diminish their quality of life.

Summary of Cumulative Impacts to Social Conditions

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

No alternative would affect the demographics, major social trends, or social organization in the local communities of the planning area.

Under Alternatives A, B and parts of C, Monument management would not differ a great deal from how it has been managed in the past. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. The quality of life of the above groups and individuals would be enhanced by these alternatives because their lifestyle needs would be met. Opportunities for motorized recreation predominate under these alternatives. Game retrieval by motorized vehicle would be the most liberal. Livestock permittees would continue to access their allotments as they have in the past and resource reserve allotments could allow added management flexibility. Groups and individuals who desire a primitive, quiet recreation experience, and those who would give a high priority to resource protection, would not feel the Monument resources would be adequately protected, the opportunities they desire would be available, or that these alternatives offer the ability to address current or future problems. Quality of life for these groups and individuals may decline under these alternatives.

Under Alternatives D and F (Preferred Alternative), the activities in the Monument would be more restricted than under Alternatives A and B. Groups and individuals who desire a primitive, quiet recreation experience, and those who give a high priority to resource protection, would feel the Monument resources would be adequately protected and the opportunities they desire would be available. Quality of life for these groups and individuals may be enhanced under these alternatives. 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. 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. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has

adequately protected Monument resources. The quality of life of the above groups and individuals may be diminished by these alternatives because of restrictions on activities they consider very important to their lifestyles.

Under Alternative E, the activities in the Monument would be more restricted than under any other alternative. Groups and individuals who desire a primitive, quiet recreation experience, and those who give a high priority to resource protection would feel the Monument resources would be adequately protected and the opportunities they desire would be available. Quality of life for these groups and individuals would be enhanced under these alternatives. However, they may also feel that the proposed restrictions would be too extreme. Opportunities to retrieve game by motorized vehicle would be the most restrictive of all the alternatives. 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. Groups and individuals who give a high priority to resource use, as well as many ranchers and other local residents, indicate that Monument management should continue as it has in the past and that this management has adequately protected Monument resources. The quality of life of the above groups and individuals would be diminished by this alternative because of restrictions on activities they consider very important to their lifestyles.

Economic Conditions

Introduction

Alternative A is the baseline condition to which all other alternatives are compared in order to assess economic impact. For example, a total of 56 wells could be drilled under Alternative A and 55 wells could be drilled under Alternative F, so the economic impact of Alternative F is based on the effects of one less well. Although current management (Alternative A) may differ from management prior to the creation of the Monument, this EIS does not address any impacts that may have resulted from the initial creation of the Monument as these impacts are not a result of the Proposed RMP alternatives.

Local economic impacts of the alternatives are measured in terms of jobs, income, economic output, and tax revenue. Additionally, this analysis considers the effect of the alternatives on non-commercial, or non-market economic benefits that impact individual well-being but do not involve a monetary transfer. Non-market economic benefits include use benefits to boaters, hunters, and other recreationists related to the quantity and quality of recreational opportunities, as well as non-

use benefits to individuals valuing the existence of preserved spaces or of resources such as wildlife.

The source of economic impacts due to the alternatives is a change in resource use or quality. As discussed in Chapter 3, the primary economic uses of the Monument lands are grazing, natural gas extraction, and recreation and amenity values. The level of these economic uses in each alternative and the associated effects on environmental quality determine the effect of the alternative on the economy, property values, taxes, and non-market benefits. Previous sections of this chapter estimated the impacts of the alternatives on each primary type of resource and resource use in the Monument. It is estimated that there were minimal foreseeable effects on grazing due to the management alternatives, some effects to oil and gas development on existing leases, some effects on transportation, and potential effects on recreational activity and wildlife (see sections labeled Livestock Grazing, Minerals - Oil and Gas, Transportation, Recreation, and Fish and Wildlife).

In general, it is estimated that the natural resources contained within the Monument would not be reallocated to different uses as a result of the alternatives, 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. Overall, the alternatives being considered do not reallocate resources from the current condition but rather deal with changing management direction in a manner that responds to the goals and objectives set forth in the Monument Proclamation and the planning process. 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, county property taxes, and non-market benefits. That is, the current direction and alternatives to it are not expected to significantly influence these economic factors.

During the period 1995 to 2004, employment in the study area grew by 3%. No forces are 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 increased by 22% between 1995 and 2004, with the largest contributing factors being increases in proprietor's income and transfer payments. Fluctuations in proprietor income tend to reflect changes in market prices and costs, factors that will not be influenced by current direction or the alternatives to it. As most transfer payments originate outside the study area, these will not be influenced by the management alternatives.

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. Additionally, none of the direction is expected to significantly affect property values and the property tax base. Slight changes in revenue to local entities are expected in some alternatives due to management direction related to natural gas production.

Similarly, non-market economic benefits are not expected to vary substantially between the alternatives due to the resource protection and variety of recreational opportunities offered in all alternatives. The analysis in preceding sections indicates that there are potential differences between the alternatives in terms of impact to soils, vegetation, wildlife, visual resources, and recreational opportunities, but in general the impacts were expected to be limited. This indicates that the incremental effect of each alternative on non-market benefits may also be limited.

Impacts to Economic Conditions Common to All Alternatives

As mentioned above, there are a few exceptions where alternatives may affect resource users and non-market benefits. The users most likely to be affected are those involved with natural gas or recreation. Also, there would be potential differences in BLM management costs associated with some alternative direction.

Ranching

The Proclamation states that "Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument." Therefore, the monument designation does not in itself change grazing. Continued livestock grazing is common to all alternatives considered. However, as with all BLM grazing permits/leases on public lands, authorized livestock grazing may be adjusted (AUMs or cattle numbers may be reduced, seasons of use adjusted) in the Monument if necessary to meet the Standards for Rangeland Health and implement the Guidelines for Livestock Grazing Management. Additional restrictions on Monument grazing would apply if necessary to protect the objects of the Monument. However, restrictions on grazing due to the alternatives that are in excess of the management guidelines established by the Standards for Rangeland Health and Guidelines for Livestock Grazing Management are expected to impact Monument AUMs or cattle numbers by less than 1% annually.

If there were changes in Monument forage availability, individual ranch operators could be economically

affected, but there would not be a measurable effect on the ranching industry in the five-county study area. In 2005, the Monument grazing allotments provided an estimated 38,000 AUMs. Between 2000 and 2005, there was an average of 204,000 beef cows on ranches in the study area.¹ The forage provided by Monument grazing allotments therefore represents 1% to 2% of the nutritional needs for all beef cattle in the five-county study area, with a higher proportion being supported in Blaine and Fergus Counties (Table 4.43). The grazing allotments are utilized for the most part, however, in the summer months between May and October. Assuming 1 AUM per cow per month, approximately 6,300 cows could be supported in the Monument for six months of the year. Therefore, approximately 3% of the beef cattle in the five-county area (6,300 of 204,000 cattle) may be partially supported by Monument grazing. In Blaine County, which is the county most dependent on Monument forage, approximately 4.5% of the beef cattle (approximately 2,000 of 45,000 cattle) may be supported in the summer months by Monument grazing. While the regional cattle industry does not depend heavily on Monument forage, some individual operators with grazing allotments within the Monument are seasonally dependent on Monument forage and therefore could be substantially affected by any reductions in Monument forage availability.

The value of Monument AUMs to ranchers can be evaluated by analyzing the price of substitute feed relative to the price of AUMs on BLM grazing land. If AUMs were reduced in the Monument, ranchers would have a number of options. They could rent private pasture, feed hay to their cattle, or adjust their operations. Grazing fees on BLM land average \$1.50 per AUM.² This compares to average private pasture rentals in Montana of \$16.40 per AUM³, or the cost of grass hay equivalent to 1 AUM of approximately \$25 (based on a conversion of 3.3 AUMs to 1 ton of grass hay and a price of \$80 per ton). The value of public grazing in terms of avoided feed cost is thus approximately \$15 to \$25 per AUM. This value roughly approximates the economic impact in terms of increased cost/reduced income that might be felt by individual ranchers if AUMs in the Monument were to be reduced

¹ National Agricultural Statistics Services, United States Department of Agriculture, "Quick Statistics: Agricultural Statistics Database," <http://www.nass.usda.gov/QuickStats/>, Accessed November 2006.

² United States Government Accountability Office, 2005, "Livestock Grazing: Federal Expenditures and Receipts Vary, Depending on the Agency and the Purpose of the Fee Charged", GAO-05-869.

³ United States Government Accountability Office, 2005, "Livestock Grazing: Federal Expenditures and Receipts Vary, Depending on the Agency and the Purpose of the Fee Charged", GAO-05-869. Value converted from 2004 dollars to 2005 dollars using the Consumer Price Index.

in order to meet Standards for Rangeland Health and Guidelines for Livestock Grazing Management.

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 for commercial outfitters or recreationists. Special Recreation Permits (SRPs) would continue to be required for both upland and river commercial outfitters in all alternatives, with the number of SRPs issued equaling or exceeding the current number.

Property Values

Various economic studies have shown that the preservation of natural landscapes often leads to increased value of neighboring properties due to enhanced scenic and recreational values (Sonoran Institute 2004, Phillips 2000, etc.). Additionally, regions with protected natural landscapes often experience increased population growth, which also increases economic growth and property values. Land in and around the Monument is valued for both its scenery and its recreational value, particularly for hunting big game.

Prior to the Monument designation, the area was already being recognized as a valued natural area, as evidenced by the fact that land in the area was being purchased by individuals seeking a rural vacation or retirement home. Purchase of land for vacation or retirement homes tends to raise local property values. Due to the enhanced protection of the landscape provided by the monument designation combined with the national attention generated, it is expected that property values may be further increased in the area under all alternatives.

However, the differential effect of the various alternatives on property values is difficult to evaluate. Some studies have indicated that the more public lands are protected, the greater the effect on local property values. All alternatives are designed to provide for the "proper care and management of the objects to be protected," but some alternatives, particularly Alternative E, further restrict development and use. It is generally not known the extent to which additional protections would influence the biological resources of the Monument, recreational use, or related economic benefits to residents and visitors. It is therefore unknown if alternatives more restrictive of development (such as Alternative E) would measurably alter property values or other economic values.

Additionally, several other factors affect the magnitude of the effect of protected landscapes on growth and property values. For example, typically the closer a

protected area is to an urban center and associated services such as airports, the larger the effect on regional growth and property values. The largest urban area in the vicinity of the Monument is Billings, and it has a population under 100,000 and is over 100 miles distant. The lack of a proximate urban center may limit the potential of the Monument to serve as an economic growth engine for the local community.

Natural Gas

The Proclamation states, “The Secretary of the Interior shall manage development on existing oil and gas leases within 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, likely leading to different levels of natural gas production under each management alternative. 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. Additionally, the monument designation itself may have reduced the feasibility of oil and gas development on private lands due to the withdrawal of adjacent Monument lands from leasing, but this potential effect does not vary by management alternatives.

Government Expenditures

The costs to the federal government 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 the federal budgeting and appropriations process. Predicting actual funding levels from this process is speculative. Expenditures by local emergency service jurisdictions may increase if increased visitation to the Monument raises the frequency of emergencies.

Government Revenue

All alternatives would allow the acquisition of private property intermingled with the Monument from willing private sellers. Such acquisitions would most likely have minimal impact on local property tax revenue. The BLM is not anticipating large private land acquisitions, but if that occurs, it is possible that the Payments in Lieu of Taxes (PILT) to the counties would not increase. (As described in the Economics Section of Chapter 3, PILT are payments by the federal government to counties to compensate counties for federal lands not contributing to property taxes.) Therefore, the counties could lose revenues equivalent to the property tax revenues from acquired private acreage. Private lands intermingled with the Monument are primarily grazing lands, and property taxes on grazing lands within the study area in 2005 were approximately \$1.40 per acre according to the Montana Department of Revenue. The tax effects of BLM land acquisitions could thus be approximately \$1.40 per acquired acre.

Recreation fees levied by the BLM may be collected by the BLM and used to offset some increased costs of recreation administration and emergency service provision. No effect on gas road tax revenue is expected. Local, state, and federal tax revenues are expected to differ by alternative due primarily to the effect of management direction on natural gas development.

**Table 4.43
Proportion of Cattle Nutritional Needs Supplied by Monument Forage**

<i>County</i>	<i># Cattle by County</i>	<i>Annual Nutritional Needs by County (AUMs)</i>	<i>AUMs from Monument</i>	<i>Annual Nutritional Needs from Monument</i>	<i>6-month Nutritional Needs from Monument</i>
Blaine	45,000	540,000	11,800	2.2%	4.4%
Chouteau	24,500	294,000	3,800	1.3%	2.6%
Fergus	68,857	826,286	16,300	2.0%	3.9%
Hill	17,429	209,143	0	0.0%	0.0%
Phillips	48,000	576,000	6,100	1.1%	2.1%
Total	203,786	2,445,429	38,000	1.6%	3.1%

The cumulative impact on total government revenues under all alternatives is expected to be less than 1.0% at all levels of government.

Impacts to Economic Conditions from Health of the Land and Fire

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. Additionally, there may be affects to Grazing and wildlife-related economic benefits of the Monument as outlined below.

Grazing

Protection of sage-grouse habitat under Alternatives B through F may limit grazing use in key habitat areas compared to Alternative A. This could increase costs to the eight permittees with allotments containing key sage-grouse habitat. These changes would be very small as there are few sage-grouse leks involved, and therefore few grazing acres affected. The impact to affected grazing permittees would probably be more in season of use than in AUMs available. Additionally, prescribed fire and conversion of non-native grasses to native vegetation under Alternatives B through F could result in temporary adjustments to grazing season of use, or stock rates or densities. In total, it is expected that these management adjustments would temporarily affect less than 0.1% of the total AUMs in the Monument, or 38 AUMs.

In total, it is expected that these management adjustments under Alternatives B, C, D, and F could temporarily affect 0.1% of the total AUMs in the Monument, or 380 AUMs. Under Alternative E, it is estimated that management adjustments could temporarily affect 1% of the total AUMs in the Monument.

Assuming an economic cost of \$15 to \$25 per AUM (see derivation above in the Ranching section under Impacts to Economics Common to All Alternatives), the total annual economic impact of Alternatives B, C, D and F on rancher income would be approximately \$570 to \$950. The impact of Alternative E would be approximately \$5,700 to \$9,500.

Ranching may also be affected by the proposed Visual Resource Management (VRM) classifications for lands in the Monument, which differ by alternative. Alternatives B through F all increase the acreage in VRM Class I from 61,700 acres to 111,480 acres (this acreage includes the WSAs, the Bodmer Landscapes, and the wild segments of the UMNWSR). Alternatives D and E provide the highest protection of visual resources since all remaining acreage (263,520 acres) in these alternatives is categorized as VRM Class II.

Alternative C and F also increase acreage in VRM Class II compared to Alternative A, while Alternative B reduces the acreage in VRM Class II. In VRM Class I areas, the BLM would reduce the visual contrast on BLM land 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. New surface-disturbing activities may be prohibited in VRM Class I areas if the activities are not designed to meet visual quality objectives. In VRM Class II areas (and potentially in Class III and IV areas), all surface-disturbing activities, 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 visual quality objectives.

As discussed in the Grazing section of this chapter, routine maintenance of existing structures would not be affected by the VRM classifications so long as maintenance does not substantively change the design or surface area of a structure. New surface-disturbing projects may require modifications that reduce the visual impact of the project on the landscape. Such modifications may increase the cost of new range improvement projects, particularly in Alternatives D and E, and to a lesser extent in Alternatives C and F. While the number of affected improvements and potential cost increases are not known, the total impact on ranchers is likely limited since existing range improvements are not affected.

Wildlife-Related Recreation and Non-Market Benefits

The alternatives differ in the protection from surface-disturbing or disruptive activities provided to habitat of sage-grouse, black-tailed prairie dogs, bald eagles, big game, bighorn sheep, and designated sensitive species. Specifically, the distance requirements from identified key habitat areas and the seasonal restrictions for surface-disturbing or disruptive activities differ by alternative. In general, Alternative E provides the most habitat protection, and Alternatives A and B provide the least protection. Providing greater habitat protection would tend to increase wildlife populations.

Increased wildlife populations might attract more visitors to the Monument, which would positively impact the local economy, particularly the services sector that provides food and lodging to visitors. Long-term increases to wildlife populations would also result in non-market economic benefits to wildlife viewers and hunters, who would benefit from the higher likelihood of being able to view or hunt a species. Additionally, enhanced wildlife populations could increase passive use values (existence values), which is the benefit accruing to people who value the wildlife but may never see the wildlife or otherwise directly benefit from its existence.

However, as the biological benefits of increased protection are unknown, it is difficult to predict the incremental economic impacts of the different levels of habitat protection offered by the alternatives.

Impacts to Economic Conditions 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 federal 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 would be charged for camping overnight at the James Kipp Recreation Area. An average of \$15,000 per year is currently 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 permits 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 (e.g. the most cost-efficient firms may be excluded from the market, potentially resulting in higher trip prices, reduced trip demand, and less economic benefit to recreationists). Thus Alternatives A, C, D, and F may reduce market efficiency if additional firms could offer trips for a lower price. The effects of restricting SRPs on the local economy are unclear. If the restriction prevents local outfitters that could offer trips at a lower cost from entering the market, then the restriction may result in fewer visitors to the Monument and less tourism-generated income. However, since most current outfitters are based in local gateway communities, restricting the number of SRPs could be beneficial to the local economy as local outfitting businesses would potentially face less competition from outside firms.

In Alternative E, the number of river user days would be limited for commercial users, potentially reducing the economic benefit to both the local community (in terms

of jobs and income supported by the outfitting industry) and recreationists (in terms of non-market benefit of boating the river). In Alternatives C, D and F, if use grows to the point where the standards and indicators (Appendix Q) are exceeded, the BLM may impose an upper limit on the number of river trips with commercial outfitters. If imposed this limit would be above current use levels, and so it could constrain the economic growth potential of the river outfitting industry but would not reduce it from its current size.

Regarding SRPs for commercial hunting in the uplands, the alternatives differ in the number of permits that could be issued and the areas where the permits are 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 permits to the current number. If visitor levels or patterns of use change, it may be necessary to issue additional or fewer permits, adjust use areas, or include conditions on the 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 may reduce 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. Regarding upland outfitting, 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, the most restrictive alternative. As with commercial river recreation, SRPs for commercial hunting in the uplands would not limit the number of trips or visitation days so are not expected to affect the associated economic benefits to the local community in terms of jobs and income. In Alternative F, the number of user days could be limited by the BLM if visitor use levels rise. Similar to the commercial river recreation case, this limit could constrain the economic growth potential of the outfitting industry but would not result in a reduction to its current size.

The restrictions on motorized use of the river also differ by alternative. Alternative E would not allow any motorized watercraft and Alternative B would allow motorized watercraft on all portions of the river. During the summer months, Alternatives D and F would restrict watercraft from the lower section of the river (Holmes Council Island to the Fred Robinson Bridge) while Alternatives A and C would limit motorized use to no-wake speed downstream travel in this river section. All stretches of the river would continue to be open for motorized boating the rest of the year, including upstream travel. Alternative F would also shift the restricted season approximately two weeks later

compared to Alternative A, resulting in two more weeks of unrestricted boating during the paddlefish angling season. Alternative F also allows motorized downstream travel certain days of the week in the seasonally restricted lower river section.

The effect of the alternatives on the local tourism and recreation industry depends on the net effect of the motorized boat restrictions on the number of non-local visitors who come to the Monument and their expenditures in the local area. Non-local visitors contribute to the local economy through their spending at such establishments as local stores, hotels, and restaurants. Restrictions on motorized boating may increase visitation of the Monument by non-motorized boaters preferring to boat the river without the sight, sound, and smell of motorized boats, but may also decrease visitation by motorized boaters. It is anticipated that restricting motorized boating during the summer months would result in little impact to motorized boater visitation since most motorized use of the river occurs during the spring and fall. For example, in 2005 there were only 18 registered visitors using motorized boats from Holmes Council Island to the Fred Robinson Bridge during the timeframe that would be seasonally restricted in Alternatives A, C, D, and F. Alternative E, however, would eliminate all motorized boating year-round from river miles 0 to 149, with unknown local economic impacts since year-round motorized use figures are unavailable.

As the predominant non-local use of the Monument is non-motorized boating, restrictions benefiting non-motorized boaters may increase the number of visitors to the area and therefore benefit the tourism and recreation industry. However, as all alternatives allow non-motorized boating on all sections of river, and all alternatives except Alternative E seasonally allow motorized boating on all sections of the river, the differential effects of the alternatives on the local tourism and recreation industry may be limited.

Changing the availability and quality of recreational opportunities in the Monument may also affect the non-market economic benefit to recreationists if their recreational experience changes. Limiting motorized use of the river may result in economic benefits to non-motorized users and economic harm to motorized users. A non-motorized stretch of river may enhance the experience (and therefore create economic benefits) to river floaters who prefer to not be impacted by the sight, sound, and smell of motorized watercraft, but may economically harm motorized recreationists (such as anglers and hunters) who might otherwise boat the river during restricted periods. However, as most non-motorized users float the river in the summer season and there is currently limited motorized use of the restricted river section in the summer, compared to Alternative A the non-market economic effects of Alternatives C, D,

and F on both motorized and non-motorized users may be limited.

Impacts to Economic Conditions from Natural Gas Exploration and Development

The number of estimated reasonable foreseeable development (RFD) natural gas wells differs by alternative, resulting in different impacts on the regional economy and government revenue. Impacts were based on the estimated total production value of natural gas produced under each alternative compared to Alternative A. The Proclamation withdrew Monument lands from future leasing, which has economic impacts and effects on government tax revenues. These impacts, however, are due to the Monument designation and not the proposed management alternatives, and are therefore not analyzed.

Total production value varies by drilled well since not all drilled wells become producing wells. Additionally, 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, average drilling success rates and gas production quantities per well lifetime were utilized to estimate the average production from each drilled well on an annual basis.

An analysis of natural gas wells drilled in the Monument area indicates that approximately 35% of drilled wells become successfully producing wells, and that these wells produce about 390,000 MCF (thousand cubic feet) of natural gas over the lifetime of the well (Table 4.44). Since wells typically produce for approximately 15 years, average annual production for every drilled well is estimated at 9,100 MCF. Value of expected production is calculated using a price of \$5.35 per MCF. This price is based on data estimated by the Montana State Revenue and Transportation Interim Committee (RTIC), which collects and forecasts natural gas price data in order to estimate state revenue. The RTIC price is forecasted to average \$5.35 between 2003 and 2009. The estimated economic impact of the alternatives varies considerably depending on the price assumption. As the price of natural gas has fluctuated widely in the past decade, and may continue to fluctuate, estimated impacts should be interpreted as approximate figures. Tables 4.44 and 4.45 presents expected natural gas output and value, as well as total tax revenue under each alternative.

Tax revenue from natural gas production in the Monument has two components: federal royalty taxes for federal mineral leases, and Montana state production taxes. The federal government levies a 12.5% royalty on all federal leases. This revenue is distributed as follows: 50% to the federal government, and 50% to Montana state government which then distributes 25% of the state share to the county government where drilling occurred.

Table 4.44 Value of Natural Gas Production by Alternative (in 2005\$)							
	<i>Alternative A (Current Management)</i>	<i>Alternative B</i>	<i>Alternative C</i>	<i>Alternative D</i>	<i>Alternative E</i>	<i>Alternative E_{NL}</i>	<i>Alternative F (Preferred Alternative)</i>
Number of Drilled Wells	56	67	49	33	18	18	55
Total Production (MCF)	7,644,000	9,146,000	6,689,000	4,505,000	2,457,000	2,457,000	7,508,000
Total Production Value	\$40,895,000	\$48,928,000	\$35,783,000	\$24,099,000	\$13,145,000	\$13,145,000	\$40,165,000
Annual Production Value	\$2,726,000	\$3,262,000	\$2,386,000	\$1,607,000	\$876,000	\$876,000	\$2,678,000
Annual Lease Revenue	\$21,000	\$21,000	\$21,000	\$21,000	\$21,000	\$1,000	\$21,000
Total Royalty/Tax Revenue	\$555,000	\$664,000	\$485,000	\$327,000	\$179,000	\$179,000	\$545,000
<i>Annual Federal Royalties</i>	<i>\$341,000</i>	<i>\$408,000</i>	<i>\$298,000</i>	<i>\$201,000</i>	<i>\$110,000</i>	<i>\$110,000</i>	<i>\$335,000</i>
<i>MT Oil and Natural Gas Production Tax</i>	<i>\$214,000</i>	<i>\$256,000</i>	<i>\$187,000</i>	<i>\$126,000</i>	<i>\$69,000</i>	<i>\$69,000</i>	<i>\$210,000</i>
Regional Economic Contribution							
Output	\$3,798,700	\$4,483,700	\$3,362,800	\$2,366,400	\$1,432,300	\$1,432,300	\$3,736,400
Employment	14	16	12	9	5	5	13
Labor Income	\$716,000	\$845,100	\$633,800	\$446,000	\$270,000	\$270,000	\$704,200

Table 4.45						
Impacts of Natural Gas Production by Alternative						
(Compared to Alternative A, in 2005\$)						
	<i>Alternative B</i>	<i>Alternative C</i>	<i>Alternative D</i>	<i>Alternative E</i>	<i>Alternative E_{NL}</i>	<i>Alternative F (Preferred Alternative)</i>
Government Revenue						
Federal Revenue	\$33,000	-\$21,000	-\$70,000	-\$116,000	-\$136,000	-\$3,000
State Revenue	\$42,000	-\$28,000	-\$89,000	-\$148,000	-\$148,000	-\$5,000
County Revenue	\$26,000	-\$17,000	-\$56,000	-\$92,000	-\$92,000	-\$3,000
<i>Blaine</i>	\$24,000	-\$19,000	-\$51,000	-\$87,000	-\$87,000	-\$5,000
<i>Chouteau</i>	\$0	\$0	-\$5,000	-\$5,000	-\$5,000	\$0
<i>Fergus</i>	\$2,000	\$2,000	\$0	\$0	\$0	\$2,000
<i>Hill</i>	\$0	\$0	\$0	\$0	\$0	\$0
<i>Phillips</i>	\$0	\$0	\$0	\$0	\$0	\$0
School District Revenue	\$7,000	-\$2,000	-\$13,000	-\$21,000	-\$21,000	\$1,000
<i>Blaine</i>	\$5,000	-\$4,000	-\$12,000	-\$20,000	-\$20,000	-\$1,000
<i>Chouteau</i>	\$0	\$0	-\$1,000	-\$1,000	-\$1,000	\$0
<i>Fergus</i>	\$2,000	\$2,000	\$0	\$0	\$0	\$2,000
<i>Hill</i>	\$0	\$0	\$0	\$0	\$0	\$0
<i>Phillips</i>	\$0	\$0	\$0	\$0	\$0	\$0
Regional Economic Impact						
Change in Employment	2	-2	-5	-9	-9	-1
Change in Labor Income	\$129,000	-\$82,000	-\$270,000	-\$446,000	-\$446,000	-\$12,000

The Montana Oil and Natural Gas Production Tax consists of a 0.05% tax rate in the first year of production and a 9.26% tax rate in succeeding years. This tax is levied on the 87.5% of production value remaining after the royalty, and is approximately distributed as follows⁴: 40% to the state, 40% to the local county and 20% to the local school district.

Due to the disbursed mineral ownership within the Monument Study Area, the federal government does not own 100% of the mineral rights to all wells analyzed in this section so federal royalties would not be assessed on all RFD production in the Monument area. However, it is assumed in this section that federal royalties are paid on all Monument natural gas production. The federal royalty tax revenue impacts are therefore slightly overstated.

In addition to royalties, on non-producing leases the federal government receives annual rental payments of \$1.50 per leased acre, which increases to \$2.00 per acre after the first five years of the lease. As all leases in the Monument were issued at least five years ago, the annual rental payments are calculated at a rate of \$2.00 per acre. The only non-producing leases in the Monument are the West HiLine Leases and one Non-West HiLine Lease (MTM 89460). Rental payments would therefore only be collected on these leases (although minimum royalty payments of \$1.00 per acre are also collected on any producing leases). Acreage for the West HiLine Leases in the Monument totals 10,328 acres, so rental payment for these leases is \$20,656. Acreage in the one Non-West HiLine Lease not in production is 40 acres, so rental payment on this lease is \$800 annually. Total rental payments of \$21,456 would be received under all Alternatives, with the exception of the No-Lease Alternative E_{NL}. Under Alternative E_{NL} the 12 West HiLine leases would not be leased, reducing federal rental payment revenue by \$20,656 annually. Apart from the effect on rental payments to the federal government, Alternative E_{NL} does not differ from Alternative E.

Alternative A reflects expected natural gas production under current management. The 56 foreseeable natural gas wells associated with Alternative A would produce gas valued at an estimated \$40.9 million, or \$2.7 million annually for 15 years. As this money is re-spent in other economic sectors, the total output is expected to support \$3.8 million dollars in total average annual output, 13 jobs, and over \$0.7 million in labor income. It should be noted that \$2.7 million of the total output is the value of the natural gas produced, and most of this \$2.7 million would be exported from the area and little, if any, retained in the area. The economic activity generated

⁴ The exact allocation of the state production tax revenue between the state, local county, and local school district is defined statutorily and varies by county.

would be less than 0.05% of the total employment and labor income in the five-county regional economy. Average annual tax revenue for all levels of government supported by Alternative A is \$554,900, of which approximately 30% would go to local government and schools in the five-county study area.

The economic effects and government revenue impacts created by the different number of gas wells for each alternative compared to Alternative A are shown in Table 4.45. Alternative B would support more government revenue, employment, and labor income in the regional economy than Alternative A. Alternatives C, D, and E would support less government revenue, 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 and tax revenues to governments are average annual values for the life of the well (approximately 15 years). The rents and royalties also comprise less than 1.0% of total government revenue at all levels.

As noted above, Alternatives D and E most highly restrict natural gas development and result in lower natural gas output and less government revenue. However, there may be some economic benefits of natural gas restriction that could offset some or all of the economic losses. Protecting the natural landscape from the ground and noise disturbance and visual effect of natural gas wells may benefit wildlife, recreationists, and potentially local property owners. Additionally, people across the nation may value the existence of an undeveloped landscape in the Missouri Breaks, even if they do not visit the area (this is known as non-use or existence value). The economic literature contains many studies that find a high value in preserving natural spaces (e.g., Phillips 2000, Sonoran 2004). These values, however, are location and ecosystem specific.

While the value of preserving natural landscapes is often quite high, several factors may limit the economic benefits of restricting natural gas development from 56 wells in Alternative A to 18 wells in Alternative E or 33 wells in Alternative D. First, the Monument is in a fairly remote area, which tends to reduce preservation benefits since fewer people are benefiting from the landscape. The largest urban area in the vicinity of the Monument is Billings, and it has a population under 100,000 and is over 100 miles distant. Secondly, all alternatives are designed to provide for the “proper care and management of the objects to be protected,” so the economic value of the additional protection offered by Alternatives D and E may be limited. For example, Alternative F prohibits surface-disturbing activities within the line of sight/sound (or 300 feet whichever is closer) of developed recreation areas (Level 1, 2, or 3)

and undeveloped recreation areas receiving concentrated public use. Additionally, no surface-disturbing activities are allowed in VRM Class I areas under Alternative F. Alternative E restricts development and use further. It is generally not known how the additional protections provided in Alternatives D and E would influence the biological resources of the Monument, recreational use, or related economic benefits to residents and visitors.

Regarding wildlife, the current low density of existing wells, infrastructure, and associated traffic seems to be having a minimal effect on big game species. Effects on other species have not been documented enough to determine total impacts. While wildlife would increasingly be impacted by more wells and infrastructure, only Alternative B would result in increased natural gas development. Impacts to all wildlife species have not been documented with the current levels of development, but it is expected that reducing natural gas development in Alternatives D and E would reduce impacts and benefit wildlife. The level of such benefits is not known. If wildlife populations were to increase, and it led to increased visitation to the Monument area, then the local economy would benefit from the associated increased visitor expenditure. Non-market economic benefits would also accrue to wildlife-related recreationists as increased wildlife populations would increase hunting and wildlife viewing success.

Finally, it is not known how RFD wells would affect Monument recreation as the wells are located out of sight of the river and developed recreation sites. Upland recreation in the area of the RFD wells primarily consists of hunting, and it is generally perceived by BLM managers that the presence of natural gas wells does not affect most hunters' recreation experience. Also, while the visual landscape is affected by the natural gas wells, the RFD wells comply with the VRM class designations proposed under each alternative and therefore are unlikely to jeopardize the overall scenic quality of the Monument. Finally, it is anticipated that evidence of natural gas development will be minimal within the next 50 years as most existing leases should be expired and productive wells depleted and rehabilitated by that time.

Impacts to Economic Conditions from Access and Transportation

Access to the Monument by road and airstrip differs by alternative. Under Alternative A, 10 airstrips and 592 miles of roads are open for motorized public travel. Alternative B would decrease the number of open roads by 20% and maintain use of the 10 airstrips. The number of open roads and airstrips would decrease under Alternatives C, D, E, and F, with Alternative E being the most restrictive. The economic effects of reduced transportation infrastructure are varied as access provides economic benefits, but may also cause economic harm by damaging natural landscapes.

Main arterial roads in particular can facilitate increased visitation and recreation in the Monument, which can result in increased economic benefits to the local economy if total visitor spending in the local area is increased. Roads through the Monument can also decrease travel time and travel costs for local residents and visitors. However, transportation infrastructure can also result in economic harm by disturbing the natural landscape and scenic values, disrupting wildlife and thereby affecting hunting opportunities, and increasing noise and air pollution.

In general, the roads being proposed for closure in the alternatives would create more primitive recreation opportunities while reducing the areas available for more developed upland recreation. As hunting is the predominant use of the uplands and most closed roads would still be accessible for game retrieval, traditional hunters would likely benefit the most from reduced road density. Negative effects of reduced road density would most likely accrue to those hunting from roads as the mileage of available roads decreases and potential crowding on remaining roads occurs. The net effect on economic benefit to hunters and visitation to the local area by hunters and other recreationists, and therefore economic impact on the local community, is not known. However, economic harm due to road closures is likely limited as road access is maintained on the major access routes and recreation areas. Even in Alternative E, 29% of the Monument is still within 1 mile of a road.

Summary of Cumulative Impacts to Economic Conditions

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

There are little to no anticipated changes in forage availability due to management direction in the alternatives. Proposed changes to VRM classifications would not affect routine maintenance, but may require modifications to some proposed projects (e.g., reservoir building) that would increase project costs.

In the uplands section of the Monument, available recreational activities exceed the current and near future demand for these opportunities. The changes in management direction in the alternatives would not materially affect this relationship, although some changes in management direction in upland areas may inconvenience or require adjustments by upland outfitters and recreationists such as hunters. Additionally, some changes in management direction for the wild and scenic portion of the river could affect river users, including outfitters and guides and recreationists. The net economic effect on recreationists from the alternatives is unknown, but likely minimal as the total number of recreationists is fairly small and the alternatives may benefit some users while harming other users.

The Monument transportation plan would affect access to the Monument and also the nature of the landscape. Alternatives C, D, E, and F would reduce the mileage of open roads and the number of open airstrips in the Monument. Road closures can result in economic benefits through positive impacts on wildlife, resource and scenic amenities, and environmental quality, but can result in economic loss through negative effects on resident, visitor, and recreation access. The net economic effect of each alternative is not known.

Natural gas operations would affect government revenue, 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.